

# **APPENDIX F**

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## **California Recycled Water Retailer Surveys**



## **TECHNICAL MEMORANDUM**

DATE: January 9, 2009 Project No.: 439-02-05-01.203

TO: Brock Buche, P.E., City of Fresno

FROM: Gerry Nakano, P.E.  
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SUBJECT: California Recycled Water Retailer Surveys

### **INTRODUCTION**

West Yost Associates (WYA) conducted a survey on behalf of the City of Fresno (City) to obtain information on the current use of and/or marketing strategies of successful on-going recycled water programs in California. The following five recycled water retailers were surveyed by WYA:

- City of Santa Rosa
- Town of Windsor
- Monterey Regional Water Pollution Control Agency (MRWPCA)
- Orange County Water District (OCWD)
- Inland Empire Utilities Agency (IEUA)

These agencies are located throughout California and provide a diverse range of recycled water usages and capacities. Figure E-1 illustrates the location of the five recycled water suppliers which WYA surveyed. Both the Town of Windsor and the City of Santa Rosa are located in Sonoma County. MRWPCA is in Monterey County. OCWD and IEUA are both located in Southern California in Orange and San Bernardino Counties, respectively.

All agencies discussed reasons for providing recycled water, current and projected recycled water demands, level of treatment, cost of recycled water, infrastructure funding sources, partnerships, grants and loans received, reports and studies completed, challenges and limitations, and provided advice regarding “lessons learned.” The knowledge gained from the experience of these recycled water suppliers may assist and facilitate the City as the City makes planning decisions on its recycled water program.

All agencies were contacted via e-mail and/or telephone. Table F-1 displays the names of interviewees and interview dates of all survey participants.

**Table F-1. Recycled Water Supplier Participants**

Recycled Water Supplier	Interviewee	Date of Telephone Interview
City of Santa Rosa	Dan Carlson, Utilities Project Manager Jennifer Burke, Senior Water Resources Engineer	10/10/2008
Town of Windsor	Craig Scott, Senior Engineer	10/20/2008
MRWPCA	Karen Harris, Community Relations Specialist	10/17/2008
OCWD	David Youngblood, Director of Engineering	11/17/2008
IEUA	Sylvie Lee, Deputy Manager of Engineering	12/16/2008

## **BACKGROUND ON EACH AGENCY SURVEYED**

### **City of Santa Rosa**

The City of Santa Rosa is located in Sonoma County, Northern California, 55 miles north of San Francisco. Santa Rosa consists of approximately 27,000 acres (41.6 square miles) and has a population of 159,980 people as of 2007.

The City of Santa Rosa provides potable water services for the City of Santa Rosa and is the owner and operator of the Subregional Water Reuse System (SWRS), in which the City of Santa Rosa provides wastewater treatment and recycled water services for the cities of Santa Rosa, Rohnert Park, Cotati, Sebastopol, South Park County Sanitation District, unincorporated parts of Sonoma County, and one private company (Calpine, owners of the "Geysers" Geothermal Project). The SWRS allows the City of Santa Rosa to effectively dispose of their wastewater while providing high quality water that is approved for many non-potable purposes including irrigation of agricultural crops, vineyards, and landscaping around playgrounds, golf courses, and public parks. Components of the SWRS include the Sewer Collection System, the Laguna Treatment Plant, Agricultural Reuse System, Urban Reuse System, Geysers Recharge Project, and the Discharge System.

The agricultural and urban reuse systems convey the recycled water from the Laguna Treatment Plant to specific irrigation sites. The agricultural reuse component utilizes about one-third of the available recycled water supplies and irrigates 6,400 acres of agricultural land including pastures, hay, silage crops, vineyards, vegetables, and specialty crops. The existing urban reuse program irrigates many schools, parks, and businesses in the City of Rohnert Park and Santa Rosa. The Geysers Recharge Project, which consists of 41 miles of pipeline, four pump stations, and a terminal tank, utilizes almost half of the available recycled water by sending it to the Geysers underground steam fields to generate electricity utilizing geothermal technology for 85,000 households in Sonoma and other North Bay counties. When urban and agricultural irrigation demands are low and Geysers recharge needs are minimal, the Discharge System directly discharges recycled water to the Russian River via Laguna de Santa Rosa or Santa Rosa Creek

from numerous locations in compliance with the SWRS permit from the North Coast Regional Water Quality Control Board.

No joint powers authority or like partnerships exist between the City of Santa Rosa and another agency or city at this time. However, the City of Santa Rosa is in the process of developing an agreement with the Town of Windsor which would allow the Town of Windsor to also send approximately 0.75 million gallons per day (mgd) (840 acre-feet per year (af/yr)) of recycled water to the Geysers Recharge Project through a 30-year lease on the Geysers pipeline capacity.

The City of Santa Rosa did not prepare a feasibility study for the agricultural reuse activities that began in the 1980s. Recently, two feasibility reports have been prepared regarding overall urban reuse and specific needs in one development area (Oakmont area). A feasibility report was drafted in 2007 and is entitled, *Santa Rosa Urban Reuse Feasibility Study*, which addresses the use of recycled water in the urban environment. A separate feasibility report was drafted in 2007 entitled, *Oakmont Community – Recycled Water Feasibility Study*.

Two Recycled Water Master Plans were prepared for the SWRS. The first Recycled Water Master Plan was prepared in 2004 and it was based on the 2003 Incremental Recycled Water Program Feasibility Report and its associated memoranda. The second and more recent Recycled Water Master Plan was drafted in 2007 and describes actions taken since 2004 and incorporates the *2007 Incremental Recycled Water Program – Santa Rosa Urban Reuse Project Feasibility*.

Table F-2 summarizes the City’s current and projected future recycled water use.

**Table F-2. City of Santa Rosa Recycled Water Use**

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2005)	Projected Use (2020)	Secondary	Tertiary
Landscape Irrigation	1,594 af/yr	1,700 af/yr		X
Agricultural Irrigation	5,200 af/yr	5,200 af/yr		X
Geysers Recharge Project <sup>(a)</sup>	12,300 af/yr	12,300 af/yr		X
Other <sup>(b)</sup>	--	5,340 af/yr		X
<b>Total Annual Recycled Water Use</b>	<b>19,094 af/yr</b>	<b>24,540 af/yr</b>		<b>X</b>
<b>Total Annual Wastewater Flow</b>	<b>19,600 af/yr<sup>(c)</sup></b>	<b>31,902 af/yr<sup>(d)</sup></b>		

<sup>(a)</sup> The Geysers Recharge Project consists of underground geothermal dry steam fields that inject recycled water into the geothermal fields to generate electricity.

<sup>(b)</sup> Other uses includes a range of options for additional recycled water use as identified in the Incremental Recycled Water Program (IRWP) Recycled Water Master Plan, including increased urban reuse, increased agricultural irrigation, and increased Geysers Recharge.

<sup>(c)</sup> Based on total average daily dry weather flow of 17.5 mgd from the Laguna Treatment Plant reported on the City of Santa Rosa’s website.

<sup>(d)</sup> Source: City of Santa Rosa IRWP Recycled Water Master Plan.

## **Town of Windsor**

The Town of Windsor (Town) is located in central Sonoma County, Northern California, approximately 65 miles north of San Francisco. Windsor encompasses approximately 4,130 acres (6.5 square miles) and its population is approximately 24,900 people.

The Town provides potable water, wastewater and recycled water services to its residents, business establishments, and agriculture. Recycling wastewater for non-potable water use was considered to be the only feasible discharge option for the Town, as winter discharge to Mark West Creek is limited to only 1 percent of the natural stream flow between October 1 and May 14 per the National Pollutant Discharge Elimination System (NPDES) permit. Flows above this discharge limit are currently stored and used for seasonal irrigation of golf courses, pastures, vineyards, parks, and play fields both within and outside Town limits.

The Water Reclamation Treatment Plant (WRTP), which was originally constructed in 1964, has gone through many expansions and upgrades. The plant was first upgraded and expanded in 1971<sup>1</sup>. In 1984, the plant capacity was increased to 1.0 mgd. Major improvements to the disposal capacity occurred in 1992 with the construction of a new 5-mile 20-inch-diameter pipeline to Mark West Creek from the Effluent Pump Station. From 2000 to 2003, three stages of improvements were constructed to provide disinfected tertiary treatment for non-potable water use with design capacities of 2.25 mgd for average dry weather flow and 7.2 mgd for peak wet weather flow. The Advance Water Treatment (AWT) improvements included chemical addition facilities, flocculation tanks, AWT clarifiers, sand filters, ultraviolet (UV) disinfection, and five effluent storage ponds with a total capacity of 122 million gallons (MG). Irrigation infrastructure utilizes the 5-mile 20-inch-diameter pipeline, built in 1992, to deliver recycled water to approximately 1,500 to 2,000 agricultural acres<sup>2</sup> for irrigation. In addition, recycled water for urban use has been expanded over the years to include Town Green Park, a local soccer park, and the Vintage Greens residential subdivision.

Additional recycled water may also be sent to the City of Santa Rosa's Geysers Project as an agreement between the Town of Windsor and the City of Santa Rosa is currently being developed. Under the agreement, the Town would contribute approximately 0.75 mgd (840 af/yr) to the Geysers Recharge Project. The Town would also be required to construct a pump station at the AWT facilities and a connecting main to the Geysers Recharge pipeline, allowing conveyance of the Town's flow to the Geysers for injection into the underground steam fields.

No joint powers authority or like partnerships between the Town of Windsor and another city or agency currently exist. A Mutual Aid agreement between Santa Rosa and Windsor is currently in place to transfer potable and non-potable water between the two agencies in an emergency situation. Future partnerships were considered between the City of Santa Rosa, Sonoma County Water Agency (SCWA), and the Town of Windsor as studies have been performed to see if a joint authority is possible between Windsor, Santa Rosa, and SCWA. The studies show that joint

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<sup>1</sup> The expansion in 1971 was not described by Town of Windsor staff.

<sup>2</sup> Range of 1,500 to 2,000 acres is the total irrigation area under Alternative 4X in the Town of Windsor Water Reclamation Master Plan for Treatment, Storage, and Disposal Project.

operations between the three entities could reduce required storage volumes, required distribution and pumping capacities, and environmental impacts. In addition, such a joint authority could provide for a more reliable recycled water supply for all three entities.

No known feasibility reports were completed for recycled water programs in the Town of Windsor. Planning documents regarding recycled water are included in the 1995 Town of Windsor General Plan-2015, and 2001 Town of Windsor Water Reclamation Master Plan for Treatment, Storage and Disposal. The 1995 Town of Windsor General Plan-2015 contains several reclamation and water reuse guidelines that are required to be incorporated into future Recycled Water Master Plans. The 2001 Town of Windsor Water Reclamation Master Plan for Treatment, Storage and Disposal was prepared to provide a comprehensive description and background of the Town's adopted Water Reclamation Master Plan, which incorporates the most current General Plan, Water Reclamation Environmental Impact Report (EIR), and Town Council goals.

Table F-3 summarizes the Town's current and projected future recycled water use.

**Table F-3. Town of Windsor Recycled Water Use**

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2007)	Projected Use (2010) <sup>(a)</sup>	Secondary	Tertiary
Landscape Irrigation	372 af/yr	372 af/yr		X
Agricultural Irrigation	570 af/yr	570 af/yr		X
Geysers Recharge Project <sup>(b)</sup>	0 af/yr	840 af/yr		X
<b>Total Annual Recycled Water Use</b>	<b>942 af/yr</b>	<b>1,782 af/yr</b>		<b>X</b>
<b>Total Annual Wastewater Flow</b>	<b>2,468 af/yr</b>	<b>2,468 af/yr</b>		

<sup>(a)</sup> The Town of Windsor did not report any population or service increases in the future.

<sup>(b)</sup> The Town of Windsor is currently working on an agreement with Santa Rosa to lease Geysers pipeline capacity.

**MRWPCA**

The Monterey Regional Water Pollution Control Agency (MRWPCA) is located on the Central California Coast, 120 miles south of San Francisco. The MRWPCA operates the Regional Wastewater Treatment Plant (RWTP) which serves Pacific Grove, Monterey, Del Rey Oaks, Seaside, Sand City, Fort Ord, Marina, Castroville, Moss Landing, Boronda, Salinas, and some unincorporated areas of northern Monterey County. Additionally, MRWPCA operates the water recycling facility at the RWTP and manages the distribution system under contract with the Monterey County Water Resources Agency. The MRWPCA provides recycled water to 12,080 acres of farmland in the northern Salinas Valley and provides wastewater services to 250,000 customers. They are a non-profit public agency, joint-powers authority, governed by a board of twelve directors, one from each of the areas served.

The MRWPCA was established in 1972 by a group of community leaders that began discussing the idea of recycled water for non-potable water use as mitigation for seawater intrusion<sup>3</sup> and damage to the Monterey Bay from wastewater discharge. This led to the extensive Monterey Wastewater Reclamation Study for Agriculture that spanned from 1976 to 1987, which included five years of field tests of pathogen, tissue, and soil analyses. The successful results of this study led to the recycled water venture which was implemented in two phases. In 1989, the RWTP, a secondary wastewater treatment plant and two-mile pipeline for ocean outfall was constructed. The RWTP serves 250,000 customers and replaced eight overloaded treatment plants. Three years later (in 1992), the MRWPCA and the Monterey County Water Resources Agency (MCWRA), which is part of County government with a board of nine directors under the Board of Supervisors, formed a partnership to build the second phase of the recycled water venture. The partnership between the MRWPCA and the MCWRA allowed them to build the Castroville Seawater Intrusion Project (CSIP) and the Salinas Valley Reclamation Plant (SVRP). The SVRP was built next to the RWTP.

The CSIP is owned by the MRWPCA, and serves 12,080 acres of farmland in the northern Salinas Valley through a distribution system that consists of 45 miles of pipeline, 21 supplemental wells, 3 booster pumps, 9 monitoring sites, 222 parcels, and 112 turnouts. The SVRP, which is the tertiary component of the RWTP, treats water to a level suitable for unrestricted use for agricultural irrigation. Sixty percent of the incoming wastewater is recycled. The SVRP is owned by the MCWRA but is operated by the MRWPCA.

Only one partnership exists between MRWPCA and another agency, which is with MCWRA, mentioned above. This partnership allows the two agencies to share and use their resources more efficiently to serve the public in a cost-effective manner.

The MRWPCA stated that Recycled Water Master Plans were not completed for their system. However, a feasibility evaluation of the recycled water project was included in the Monterey Wastewater Reclamation Study for Agriculture.

Table F-4 summarizes the MRWPCA's current and projected future recycled water use.

**Table F-4. MRWPCA Recycled Water Use**

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2007)	Projected Use (2010)	Secondary	Tertiary
Agricultural Irrigation	13,331 af/yr	13,331 af/yr		X
Total Annual Recycled Water Use	13,331 af/yr	13,331 af/yr		X
Total Annual Wastewater Flow	24,640 af/yr <sup>(a)</sup>	24,640 af/yr		

<sup>(a)</sup> 24,640 af/yr receives secondary treatment.

<sup>3</sup> The seawater intrusion not only affects the drinking water supply but also threatens Monterey Bay's agricultural economy.

## **OCWD**

The Orange County Water District (OCWD) is located in Orange County, Southern California, less than 40 miles south of Los Angeles. They are governed by a board of ten directors, one from each district, representing portions of eighteen cities. The OCWD manages the groundwater basin that underlies 23 cities and water districts, providing a reliable potable water supply as a wholesaler. The service area covers approximately 224,000 acres (350 square miles) and serves more than 2.3 million people, meeting more than half of their total water demand.

The OCWD was established in 1933 by a special act of the California State Legislature to protect Orange County's water rights to the Santa Ana River. As groundwater over-pumping, seawater intrusion, and dramatic population increases negatively affected the groundwater basin, the OCWD revised and redefined their basin management practices to mitigate the overdraft of groundwater, which led to their investment in two relatively recent recycled water programs to help protect and replenish the groundwater basin.

One recycled water project to help replenish the water supply was the Green Acres Project which went on-line in 1991. The project was designed to provide recycled water for irrigating parks, golf courses, greenbelts, cemeteries and schools through the construction of a 7.5 MGD treatment plant and 25 miles of pipeline through the cities of Fountain Valley, Santa Ana, and Costa Mesa.

Seventeen years after the Green Acres Project, the Groundwater Replenishment System (GWRS) Project went on-line in January 2008 as a more extensive solution to protect the groundwater basin from seawater intrusion and groundwater overdraft through the expanded use of seawater barriers and recycled water for indirect potable water use. The GWRS Project was a joint project by the OCWD and their neighbor, the Orange County Sanitation District (OCSD). Both districts equally shared the \$486.9 million cost of capital construction of GWRS<sup>4</sup> and after the GWRS Project is fully operational, the OCWD will assume the costs of operating and maintaining the project. The GWRS Project includes the Advanced Water Purification Facility, expanded seawater barriers, and a 13-mile pipeline to carry the recycled water to two groundwater recharge basins in Anaheim. The Advance Water Purification Facility takes treated wastewater from the OCSD and processes the received wastewater through the following facilities for purification: the Screening Facility at the OCSD, Microfiltration Facility (86 mgd), Microfiltration Break Tank, Reverse Osmosis Facility (70 mgd), UV System (70 mgd), and Chemical Feed/Lime Stabilization System. The seawater barrier component of the GWRS is an expansion of their Water Factory 21 Project<sup>5</sup>. Recycled water that is not utilized for the seawater barrier is conveyed down a 13-mile pipeline to Kraemer Lake and Miller Lake, which are percolation

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<sup>4</sup> The cost-benefit analysis provided in OCWD's literature stated that OCSD would benefit by investing \$198 million in the purification of wastewater rather than building a second ocean outfall pipeline to dispose of wastewater because of the years required to plan, design, and build the project, and possible difficulty of gaining environmental approvals.

<sup>5</sup> The Water Factory 21 Project is a series of 23 injection wells using recycled water which became fully operational in 1976.

basins which are approximately 20 to 25 acres with a depth of 50 feet and 15 acres with a depth of 15 feet, respectively.

A feasibility report was conducted ten to twelve years prior to construction of the GWRS Project. Construction began in 2004 and ended in the beginning of 2008. A recycled water master plan was not prepared for the OCWD.

Table FE-5 summarizes the OCWD's current and projected future recycled water use.

**Table F-5. OCWD Recycled Water Use**

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2007)	Projected Use (2010)	Secondary	Tertiary
Landscape Irrigation & Industrial	6,720 af/yr	6,720 af/yr		X
Groundwater Recharge	51,520 af/yr	129,920 af/yr		X
Seawater Barrier	26,880 af/yr	26,880 af/yr		X
Total Annual Recycled Water Use	85,120 af/yr	163,520 af/yr		X
Total Annual Wastewater Flow <sup>(a)</sup>	NA	NA		

<sup>(a)</sup> OCWD recycles all treated wastewater that it receives from OCSD. Other wastewater flows treated by OCSD are discharged to the ocean via an ocean outfall.

**IEUA**

The Inland Empire Utilities Agency (IEUA) is located in Southern California in the southwest corner of San Bernardino County, approximately 35 miles southeast of Los Angeles. The IEUA is governed by a board of five directors, one from each district, representing a portion of the following seven cities: Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, and Upland. In addition to these cities, IEUA also serves two water districts and two water companies. The IEUA provides wholesale potable water, recycled water, biosolids, and regional wastewater treatment services to their service area that covers approximately 154,880 acres (242 square miles) and serves approximately 850,000 people.

The IEUA was originally called the Chino Basin Municipal Water District (CBMWD), which was formed in 1950. In 1998, the CBMWD officially became the IEUA. Originally, the CBMWD only served supplemental water to the Chino Basin. Since the 1950s, the IEUA's services expanded to include imported water distribution, five regional wastewater treatment plants, two non-reclaimable wastewater sewer pipelines, two reverse osmosis desalination plants, biosolids and organics management, a recycled water program, a water conservation program, as well as a groundwater recharge program with stormwater, imported water, and recycled water. The IEUA's involvement in recycled water is due to their interest to enhance water supply reliability and to improve water quality throughout the greater Chino Basin.

The IEUA’s recycled water program dates back to 1972 when Treatment Plant RP-1 first made recycled water deliveries to Prado Park (a golf course) and Westwind Park. In 1998 Carbon Canyon Water Reclamation Facility (CCWRF) made its first recycled water delivery. Subsequent treatment plants were constructed as the new Optimum Basin Management Program released by the Watermaster Board in 1998 provided guidelines for enhancing Chino Basin water supplies as well as protecting and improving groundwater quality. Several facilities were constructed to support a recycled water distribution system. The current recycled water facilities include the CCRWF, Regional Plant No. 1 (RP-1), Regional Plant No. 2 (RP-2), Regional Plant No. 4 (RP-4), and Regional Plant No. 5 (RP-5), approximately 94,205 lineal feet of pipeline to deliver over 60 mgd of recycled water to its service area, two 5.5 MG above ground steel reservoirs, and three pump stations.

Wastewater that is not reclaimable due to heavy brine is collected in a separate 62-mile Non-Reclaimable Waste System (NRW). The NRW System is comprised of two pipeline sectors: the northern and southern systems. The northern system takes the industrial wastewater and brine flows from 35 industries and routes it to the County Sanitation District of Los Angeles County (CSDLAC) for treatment and disposal via an ocean outfall. The southern system takes industrial wastewater from 10 industries and routes it to the Orange County Sanitation District for treatment and disposal via an ocean outfall.

No joint powers authority or like partnerships between the IEUA and another city or agency currently exist.

The IEUA conducted a 2002 Recycled Water Feasibility Study<sup>6</sup> in 2002, which was followed up with Phase 1 Construction in 2002. Then, in 2005, a Recycled Water Implementation Plan<sup>7</sup> was drafted and concluded in Phase 2 Construction in 2005.

Table F-6 summarizes the IEUA’s current and projected future recycled water use.

**Table F-6. IEUA Recycled Water Use**

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2007)	Projected Use (2011-2012)	Secondary	Tertiary
Landscape Irrigation,	20,600 af/yr	50,000 af/yr		X
Agricultural Irrigation				X
Industrial or Other Non Potable				X
Groundwater Recharge				X
Wetlands Restoration				X
<b>Total Annual Recycled Water Use</b>	<b>20,600 af/yr</b>	<b>50,000 af/yr</b>		<b>X</b>
<b>Total Annual Wastewater Flow</b>	<b>67,200 af/yr</b>	<b>67,200 af/yr</b>		

<sup>6</sup> The 2002 Recycled Water Feasibility Study was not available on the IEUA website.

<sup>7</sup> The 2005 Recycled Water Implementation Plan was not available on the IEUA website.

## **INFRASTRUCTURE COSTS AND FUNDING**

The following sections describe how the five surveyed agencies funded the capital costs, as well as annual operations and maintenance (O&M) costs, for their recycled water systems. It should be noted that some agencies surveyed did not report capital costs, so for purposes of this technical memorandum, approximated estimates were used. These estimates were found in reports, newsletters, and supplemental documents provided on the agencies' websites. All agencies reported using various federal, state, and local resources as revenue sources to pay for capital and O&M costs.

### **City of Santa Rosa**

As previously stated, the existing SWRS consists of the following components: Sewer Collection Systems, Laguna Treatment Plant, Agricultural Reuse System, Urban Reuse System, Geysers Recharge Project, and Discharge System. Actual costs of these capital improvements were not available. However, preliminary estimates of some of these project costs were provided in the Feasibility Studies, Master Plans, and published presentations.

The Laguna Treatment Plant Expansion was reported to cost approximately \$1.33 million for Phase 2 improvements. In addition, the estimated cost to construct an additional UV channel totaled \$9.3 million. The Urban Reuse System's pipeline construction for all four phases was estimated to cost \$152 million. The cost of Phase II construction of the Geysers Project was \$1.5 million.

The FY 2008/09 proposed budget allocated \$32.1 million to SWRS CIP projects and \$27.6 million to SWRS O&M. The City of Santa Rosa stated that a majority of the recycled water infrastructure costs were paid for by wastewater and water customers. Various grants also helped pay for infrastructure costs. The City of Santa Rosa reported that they received Clean Water Grants to help pay for infrastructure. Of the grants that they received, approximately 87 percent were federally-funded and the remaining 13 percent were state-funded. These grants included funding for pipelines, pumps, storage and land. The Geysers Recharge Project was paid for by revolving funds and municipal bonds.

### **Town of Windsor**

At the time of the Town of Windsor Water Reclamation Master Plan, the estimated capital costs of the treatment plant expansion, storage ponds, and irrigation pipelines were estimated to cost \$2.2, \$11.1, and \$8.1 million, and the associated annual O&M costs were \$2.33, \$0.3, and \$0.36 million per year, respectively. Actual capital improvement costs were not available.

The cost for recycled water pipelines to the Vintage Greens residential subdivision were paid by the developer of the homes.

The proposed Geysers connection project would require the Town to build a new pump station and pipeline to connect to the Geysers' Pipeline. Estimates for these improvements have not been released. The Town would lease capacity in the Geysers Pipeline for a term concurrent with

the 30-year term that Santa Rosa has with Calpine. Lease payments would begin at \$500,000 per year and end at \$1.5 million per year in 2038.

The FY 2008/09 adopted budget allocated \$216,155 to water reclamation capital improvements and \$2.5 million to water reclamation O&M.

The Town pays for capital costs, as well as O&M costs, using an operating fund, repair and replacement fund, and a capital fund system. The following revenue sources are used for the operating fund: property taxes, water reclamation permit fees, golf course rental income, water reclamation rates and charges, lift station fees, recycled water sales, other revenue, General Funds, Public Facility Funds, State Revolving Fund loans, and Repair and Replacement (R&R) Funds. Capital funds include connection fees, rental and miscellaneous income, State Revolving Fund loans, and debt proceeds.

### **MRWPCA**

The capital costs for the interceptor system and RTP was \$130 million and the capital costs for the SVRP and CSIP was \$75 million. The MRWPCA funded their projects with federal and state revolving loans, grants, and bonds. Their loans were acquired from the U.S. Bureau of Reclamation (USBR) and the State Water Resources Control Board.

Currently, the proposed 2008/09 O&M for the CSIP, SVRP, and service/supplies<sup>8</sup> is 8 percent, 10 percent, and 30 percent of the total budget of \$3.7 million, respectively. Operating funds are derived from sanitary sewer use, recycled water use, and property assessment fees. Sanitary sewer use fees pay for secondary treatment. Recycled water use and property assessment fees pay for tertiary treatment and delivery.

### **OCWD**

Total GWRS Project capital costs were paid for by five federal and state grants and OCWD and OCSD contributions that totaled nearly \$490 million. Two federal grants from the USEPA and the USBR in the amount of \$500,000 and \$20 million accounted for 4 percent of the total capital funds. Three state grants were also obtained: State Water Resources Control Board (\$5 million), Department of Water Resources (\$30 million), Santa Ana Watershed Project Authority (\$37 million). The state grants accounted for 16 percent of the total capital funds. The OCWD and the OCSD each paid an equal share of approximately \$199 million, which together was 80 percent of the project funds.

GWRS Project O&M costs are paid by OCWD and total nearly \$26.7 million. In April 2004, the Metropolitan Water District of Southern California awarded the OCWD \$3.8 million per year for the GWRS Project over a period of 23 years under the Metropolitan Water District Local Projects Program.

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<sup>8</sup> Expenditures for service and supplies account for the entire MRWPCA operation.

## **IEUA**

Budgeted capital costs<sup>9</sup> for recycled water infrastructure consisting of 88,245 lineal feet of pipeline, TP-1 pump station, RP-4 reservoirs and pump stations were \$50.3 million. Of this total, \$4.5 million, \$5.0 million, and \$27.7 million were for by state grants, federal grants, and SRF loans, respectively. The remaining amount was paid for by IEUA's capital funds.

The FY 2008/09 proposed budget includes \$55.3 million for the recycled water program capital improvements. Capital revenue sources include SRF loans, federal, local grants, state grants, and Commercial Paper (i.e. Capital Funds). Proceeds from the SRF loan account for 43 percent of the capital improvement costs. Three federal and local grants will help pay for the recycled water distribution system, which accounts for 23 percent of the capital improvement costs. The remaining budget is supported by Commercial Paper.

Proposed FY 2008/09 O&M budgets total \$7.0 million. Revenue sources include credits from the Metropolitan Water District Local Projects Program and the Local Resources Program of \$3.2 million, \$1.6 million from the sale of recycled water, and \$381,000 from other revenue sources. In addition, the Water Reuse Foundation will reimburse the IEUA \$116,304.

## **RECYCLED WATER RATES AND INCENTIVES**

Recycled water rates and use incentives to residents, agricultural customers, and industrial customers vary greatly among the agencies. In addition, the incentives for customers to use recycled water vary considerably.

### **City of Santa Rosa**

Agricultural customers pay an equivalent of 75 percent of their alternative water costs for recycled water supplies. Alternative water costs are primarily the operations and maintenance costs associated with groundwater pumping. These costs vary greatly from one customer to another and thus one standardized flat rate for recycled water would not appeal to all agricultural customers. However, it was reported that this pricing structure will be phased out in the next ten years.

For the City's industrial customer (Calpine), a thirty-year contract at a price of \$20/af has been agreed upon. However, the recycled water source is not reliable for Calpine during the summer months as the available recycled water is provided to agricultural customers first.

For urban customers, the cost of recycled water is 95 percent of potable water.

Currently the recycled water connection fee is the same price as the potable water service connection fee, which is \$5,211 for parcels less than 6,000 square feet and \$7,444 for parcels greater than 6,000 square feet.

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<sup>9</sup> Capital costs for many capital projects were not available to WYA.

## **Town of Windsor**

In the Town of Windsor, there are three factors that encourage recycled water usage and connections.

1. The Town of Windsor has a town ordinance that requires new developments to connect to recycled water if it is feasible.
2. The price of recycled water remains competitive to agricultural users as it is only 25 percent of the cost of potable water.
3. At this time, current urban customers are not paying for their recycled water, but they will be charged in the near future as the agreement for nonpayment has recently ended.

There are no recycled water connection fees. All fees associated with connecting to the recycled water system come from permit fees and installing recycled water meters, which are paid for by the customer.

## **MRWPCA**

MRWPCA does not provide pricing incentives to encourage the use of recycled water. Their agricultural customers, who reside over the saltwater-intruded groundwater basin, do not have any other viable water supply alternatives aside from using recycled water. The cost of recycled water is approximately 18 percent more than the cost of electricity to pump groundwater.<sup>10</sup>

The average cost of recycled water to the agricultural customers is approximately \$153/af with a minimum usage of 2 af per year. The pricing structure, which was initially agreed upon by growers and agencies, fluctuates by the location of the customers. The cost of recycled water is higher for growers directly over the seawater-intruded basin than for growers located far enough inland to not be affected by seawater-intruded groundwater.

They do not have recycled water connection fees as there is not enough recycled water during high demand to serve new customers.

## **OCWD**

Pricing strategies for OCWD do not serve a function as recycled water is indirectly supplied to water retailers through groundwater recharge.

The cost to produce recycled water supplied by OCWD's Groundwater Replenishment System (GWRs) is approximately \$700/af. The GWRs program is subsidized by Metropolitan Water District's Local Resources Program, which grants OCWD \$121/af for producing an alternative source of water. After the subsidy, the cost of producing water is approximately \$550/af. OCWD currently wholesales water for \$260/af, which is composed of recycled water, various surface

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<sup>10</sup> MRWPCA calculated that well water costs growers about \$130/af for electricity.

water, and groundwater supplies. As a comparison, the cost to purchase surface water from Metropolitan Water District is approximately \$640/af.

OCWD does not have recycled water connection fees as water retailers pump directly from the groundwater basin.

## **IEUA**

IEUA is a water wholesaler that provides water on a wholesale basis to water retailers. Pricing strategies are not directly employed by IEUA. However, the water retailers offer recycled water to their customers at a discount of 10 to 25 percent of potable water rates.

IEUA does not have recycled water connection fees but the cities and agencies they serve do charge connection fees.

## **PAST CHALLENGES**

The agencies have faced many hurdles in implementing their recycled water programs. The challenges faced by the agencies and cities varied from governmental regulations, costs, and consumer confidence.

### **City of Santa Rosa**

The City of Santa Rosa reported that many of their challenges in the past and present are in regards to incidental runoff and associated fines. The governmental regulations that define “incidental runoff” treat runoff from recycled water similar to wastewater runoff. Per these regulations, the urban and agricultural water reuse programs are sometimes cited for runoff events in which recycled water landscape irrigation drains into street gutters or for recycled water pipeline breaks.

In addition, past challenges in meeting agricultural demands were experienced between the City and the agricultural customers. These challenges were due to lack of knowledge of irrigation schedules of agricultural customers. These challenges have been met by opening lines of communication, creating a system that allows for more coordination between the City and agricultural customers, and changing operation schedules to meet their needs.

The City of Santa Rosa experienced consumer acceptance challenges when their recycled water program was planned for expansion. They overcame this challenge by receiving public relations help from the Water Reuse Foundation, an educational, nonprofit public benefit corporation that serves as a centralized organization for the water and wastewater community to advance the science of water reuse, recycling, reclamation, and desalination. They were able to use the Water Reuse Foundation’s experience and resources to help address consumer concerns regarding recycled water use and safety.

### **Town of Windsor**

The Town of Windsor reported that they originally had many difficulties meeting the regulatory requirements of the SWRCB. They have overcome these challenges by complying with the SWRCB's regulatory requirements.

Other past and present challenges are in regards to providing adequate effluent storage capacity. The Town of Windsor nearly exceeds their effluent storage capacity during the winter months when infiltration and inflow (I&I) is high and decreases in agricultural irrigation demands create critical storage capacity issues. This challenge is further complicated by their allowed discharges into the Russian River, which are limited to one percent of the stream flow, are further decreased by the recent dry weather conditions. This challenge may be mitigated by an agreement with the City of Santa Rosa, currently being developed, which would allow Windsor to route 0.75 mgd to the Geysers Project.

### **MRWPCA**

MRWPCA reported that public acceptance and perception issues were the major hurdles that they had to face in the development of their recycled water program. They overcame these two issues by providing data, good public relations in and out of the field, independent analysis of data, having an open and transparent agency, as well as providing a crisis management plan.

### **OCWD**

OCWD reported that public acceptance was the biggest hurdle in implementing their recycled water program. Their in-house public relations team talked to local groups before, during and after construction to address and respond to media and public questions and perceptions regarding the benefits and safety of recycled water.

### **IEUA**

IEUA stated that the biggest hurdle in implementing the recycled water program was the cost of the capital program, which included the cost of laterals and retrofits, and finding available funding sources.

They reported that consumer acceptance was not a significant issue for them.

## **LIMITATIONS TO PROVIDING ADDITIONAL RECYCLED WATER SUPPLIES**

All agencies reported that they are limited in their ability to sell more recycled water supplies due to regulatory issues, storage constraints, infrastructure constraints, or wastewater availability.

### **City of Santa Rosa**

The City of Santa Rosa reported that their recycled water use is currently at its maximum level based on compliance with current regulatory requirements.

### **Town of Windsor**

The Town of Windsor is limited by costs and available funding, permitting, and “restrictive” regulatory requirements. Between October 15 and May 15, the Town of Windsor is allowed to discharge an amount equal to 1 percent of the natural flow of the creek. Unfortunately, during the recent dry years the flow of the creek has been well below average and this has caused an effluent storage capacity problem (because of the inability to discharge to the creek). Critical effluent storage capacity problems are further complicated between October and December when infiltration and inflow (I&I) increases and when agricultural and residential recycled water demands decrease.

### **MRWPCA**

MRWPCA reported that they do not receive enough wastewater to treat and recycle during high summer demand periods. They also do not provide recycled water 365 days per year as agricultural demands decrease significantly during the winter months. Discharge to the ocean is required during these low recycled water demand periods. Recycled water use could be increased if additional infrastructure, funding, and political will were available to create new residential and commercial recycled water irrigation programs.

### **OCWD**

The OCWD’s ability to produce recycled water is only limited by the amount of available wastewater.

### **IEUA**

The IEUA’s recycled water program is currently limited by the need for additional recycled water infrastructure to serve the entire service area. The IEUA is currently in the process of expanding its recycled water system, which is anticipated to be completed by fiscal year 2011/2012.

## **ADVICE REGARDING “LESSONS LEARNED”**

All agencies had advice for an agency just getting into the recycled water business.

### **City of Santa Rosa**

The City of Santa Rosa urged any agency to work closely with their agricultural customers and know their business intimately in terms of irrigation schedules, as this will dictate treatment plant operations. Santa Rosa also advises that an agency seek out a private and public partnership, as the private partner normally has access to funding. Obtaining customer and potential customer input were also recommended. Seeking out a local medical office or association that is willing to make a public statement in support of recycled water helps relieve consumer concerns. It was also recommended that an agency should get involved early with the local public health office to anticipate and mitigate conflicts in rules and regulations early. Lastly, Santa Rosa advised agencies to join the Water Reuse Foundation to provide for networking opportunities with other recycled water retailers and help with public relations activities.

### **Town of Windsor**

The Town of Windsor recommended that an agency not underestimate weather variability and ensure that effluent storage capacities allow for weather variability. An increased effluent storage pond design capacity would help ensure that available storage capacity during the winter months was not exceeded when I&I is high and recycled water demands are low. It was also advised not to develop water balance models without weather variability.

### **MRWPCA**

MRWPCA advised that an agency should work closely with stakeholders.

### **OCWD**

OCWD emphasized that public outreach is very important in moving forward on any recycled water project. The OCWD noted that the City of Los Angeles' recycled water program had a poor public outreach program that ultimately resulted in termination of the recycled water program.

### **IEUA**

IEUA recommended setting up the funding/financing plan as soon as possible and developing an overall recycled water strategy to maximize the number of recycled water connections.

## **CONCLUSIONS**

The City of Fresno can find many ways to effectively expand their own recycled water program. This may be done by utilizing the collective experiences and wisdom of the five agencies surveyed, while adapting and synthesizing this information to best mesh with Fresno's local needs and constraints.

## **REFERENCES**

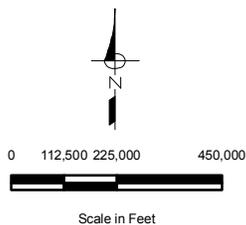
- City of Santa Rosa. (2007). *IRWP - Santa Rosa Urban Reuse Project Feasibility Study*. Santa Rosa, CA: City of Santa Rosa.
- City of Santa Rosa. (2007). *IRWP – 2007 Update to Recycled Water Master Plan*. Santa Rosa, CA: City of Santa Rosa.
- Inland Empire Utilities Agency. (2007). *Recycled Water Three Year Business Plan*. Fountain Valley, CA: IEUA.
- Inland Empire Utilities Agency. (2007). *2009 Long Range Plan of Finance*. Chino, CA: IEUA.
- MRWPCA. (2008). *Frequent Questions of MRWPCA*. Monterey, CA: MRWPCA.
- MRWPCA. (2008). *Securing Consumer Confidence: From Concept to Salad Bowl*. Monterey, CA: MRWPCA.
- MWH. (2007). *IEUA Regional Recycled Water Program 2007 Idaho Wastewater Reuse Conference*. Chino, CA: John Robinson.
- Orange County Water District. (2008). *GWRS Cost Paper*. Fountain Valley, CA: OCWD.
- Orange County Water District. (2008). *GWRS Progress Report*. Fountain Valley, CA: OCWD.
- Town of Windsor. (2001). *Town of Windsor Water Reclamation Master Plan*. Windsor, CA: Brelje & Race Consulting Engineers.
- Town of Windsor. (2007). *Water and Water Reclamation Financial Plan and Rate Study*. Windsor, CA: The Reed Group, Inc.



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**LEGEND**

- CA Counties
- Sonoma County
- Monterey County
- Orange County
- San Bernardino



**FIGURE F-1**  
**City of Fresno**  
**Metro Plan Update**  
**Phase 2 Report**  


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**Surveyed Recycled Water**  
**Supplier Locations**



**Recycled Water Retailer:** City of Santa Rosa  
**Date:** October 10, 2008  
**Interviewee(s):** Dan Carlson, Utilities Project Manager  
 Jennifer Burke, Senior Water Resources Engineer

1. What types of recycled water uses does your agency currently serve (or plan to serve in the future) and what level of treatment is provided for each type of use?

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2005)	Projected Use (2010)	Secondary	Tertiary
Landscape Irrigation	1,594 af/yr	1,595 af/yr		X
Agricultural Irrigation	5,200 af/yr	5,200 af/yr		X
Geysers Recharge Project <sup>1</sup>	12,300 af/yr	12,300 af/yr		X
<b>Total Annual Recycled Water Use</b>	<b>19,094 af/yr</b>	<b>19,095 af/yr</b>		<b>X</b>
<b>Total Annual Wastewater Flow</b>	<b>19,600 af/yr<sup>2</sup></b>	<b>19,600 af/yr<sup>3</sup></b>		

2. What was the driving force to get your agency interested in and committed to the use of recycled water for non-potable water use?

- Dan Carlson**
- 100 % disposal reasons
  - Nothing to do with water supply
  - Changed from secondary treatment to 100% tertiary treatment in 1989.
- Jennifer Burke**
- Water supply and disposal
  - RW is not cost effective from a water supply point of view but when looked at together with disposal, it is effective.

<sup>1</sup> The Geysers Recharge Project consists of underground geothermal dry steam fields that use recycled water to generate electricity.

<sup>2</sup> Based on total average daily dry weather flow of 17.5 mgd from the Laguna Treatment Plant reported on the City of Santa Rosa’s website.

<sup>3</sup> Wastewater flow is assumed to not increase from 2005 to 2010 based on no anticipated population growth due to current on-going economic downturn.

3. What is the current recycled water demand within your service area? Do you anticipate that the demand will increase in the future? If so, what is the projected future demand for recycled water in your service area?

Please see chart.

4. What types of pricing strategies or incentives have you implemented to encourage use of recycled water?

- Dan Carlson
- In the past agricultural customers were paying an equivalent of 75% of the alternative water costs for recycled water. It was not a set cost because the alternative water supply costs varied greatly.
  - This pricing for agricultural customers is phasing out in the next 10 years.
  - Calpine has a 30-year contract to pay \$20/af. This water is not guaranteed and Calpine normally takes what they can during winter and may not receive RW in summer months.
- Jennifer Burke
- City of Santa Rosa purchases RW from Subregional Water Reuse Plant for \$225/af
  - Cost is 95% of potable water.

What is the sale price of your recycled water? Approximately what percent of the actual cost to produce this level of treated water is recovered by this rate?

The current prices are found online.

5. Does this rate cover renewal and replacement costs, or just treatment costs?

Did not discuss.

6. What types of partnerships have you formed to implement your recycled water program? Is your project a joint project with a neighboring agency?

- Dan Carlson
- Not set up to be a neighboring agency.
  - Town of Windsor might be a partner in the future. Their contribution will pay for the 20% O&M costs making the operations come out even.

7. Did you receive any grant funding or low-interest loans to implement your recycled water program?

- Dan Carlson
- In the past Clean Water Grants were utilized which consisted of 87% federal funding and 13% state funding.
  - This grant paid for pipeline system, pumps, storage, and land.
  - Geysers project was paid for by State Revolving funds and Municipal bonds.

8. Who predominantly paid for the recycled water infrastructure? Existing rate payers or new development?

- Jennifer Burke
- Sewer Customers
  - 40% from water rates
  - 60% from sewer rates
  - Misc. grants

9. What is the estimated cost of the recycled water supply per acre-foot?

- Dan Carlson
- Calpine has a 30-year contract to pay \$20/af. This water is not guaranteed and Calpine normally takes what they can during winter and may not receive RW in summer months.

- Jennifer Burke
- City of Santa Rosa purchases RW from Subregional Water Reuse Plant for \$225/af

10. Is there a recycled water system “connection fee” as well?

- Jennifer Burke
- The connection fee for RW is the same as potable water connection fee.

11. Did you conduct a feasibility study for the project?

- Dan Carlson
- Feasibility studies in the 1980’s were very different from current practices. Where the studies were a “handshake.”

- Jennifer Burke
- Urban Needs study
  - Oakmont Area study that concluded that it is not feasible to expand.
  - These studies are available online.

12. Was a recycled water master plan prepared? If so, when in project development did it occur?

- Dan Carlson      • Not prepared in the past
- Jennifer Burke    • RW Master Plans were started 2 years ago
- 2004 IRWP
- 2007 IRWP

13. What were the biggest hurdles that your agency faced when implementing your recycled water program?

- Dan Carlson      • Biggest hurdles are regulatory issues that deal with incidental runoff which translate to irrigation recycled water that runs off into the gutters and breaks in pipelines.
- Regulators treat recycled water as sewage
- Jennifer Burke    • Jennifer concurs.

14. What is preventing or limiting your agency from selling more recycled water supplies?

- Dan Carlson      • Regulatory Issues
- Jennifer Burke    • Regulatory Issues

15. What advice would you give to an agency just getting into the recycled water business?

- Dan Carlson      • Make partnerships with agricultural customers. RW retailer needs to intimately understand their practices in terms of when they irrigate and when they need to dispose of water to meet their demands or provide them with storage, respectively. A big mistake is when we RW retailers think that they just need to deliver water.
- Seek out Public and Private partnerships. This is very valuable because the private knows how to do things and the also have assets to utilize.
- Join Water Reuse Foundation as they can help out with any needs whether that means PR or networking with other RW retailers.
- Jennifer Burke    • Get out there and get input from customers, potential users, and public and get their thoughts and perspectives.
- Work with local medical offices or association to get on board to do a public statement in support of RW.
- Get involved early with local Public Health agency to meet their expectations, rules and regulations early on.

**Recycled Water Retailer:** Town of Windsor  
**Date:** October 20, 2008  
**Interviewee(s):** Craig Scott, Senior Engineer

1. What types of recycled water uses does your agency currently serve (or plan to serve in the future) and what level of treatment is provided for each type of use?

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2007)	Projected Use (2010 <sup>1</sup> )	Secondary	Tertiary
Landscape Irrigation	372 af/yr	372 af/yr		X
Agricultural Irrigation	570 af/yr	570 af/yr		X
Geysers Recharge Project <sup>2</sup>	0 af/yr	840 af/yr		X
<b>Total Annual Recycled Water Use</b>	<b>942 af/yr</b>	<b>1,782 af/yr</b>		<b>X</b>
<b>Total Annual Wastewater Flow</b>	<b>2,468 af/yr</b>	<b>2,468 af/yr</b>		

- Agricultural customers account for 60% of RW demand.
- Urban customers account for 40% of RW demand.
- Irrigation and storage are intertwined. They only have 155 MG of storage currently available and any future increased RW demand would be taken from current customers or new storage facilities would need to be created.
- The possible Geysers project will take 0.5 MGD (per EIR). This plan will mitigate storage problems.

2. What was the driving force to get your agency interested in and committed to the use of recycled water for non-potable water use?

- Recycled water was the only feasible wastewater discharge option.

3. What is the current recycled water demand within your service area? Do you anticipate that the demand will increase in the future? If so, what is the projected future demand for recycled water in your service area?

See above.

4. What types of pricing strategies or incentives have you implemented to encourage use of recycled water? What is the sale price of your recycled water? Approximately what percent of the actual cost to produce this level of treated water is recovered by this rate?

<sup>1</sup> The Town of Windsor did not report any population or service increases in the future.

<sup>2</sup> The Town of Windsor is currently working on an agreement with Santa Rosa to lease Geysers pipeline capacity.

- There is an ordinance that requires new development to hook up to the recycled water pipeline, if feasible.
  - The price of RW is nearly 25% of the cost of potable water.
  - The urban customers are not paying for the RW at this time. They will be charged in the near future.
  - \$0.36/1,000 gallons or 117.31/af
  - Their revenue from RW is \$60,000/year.
  - O&M cost of treatment plant for two years is \$5.9 million.
  - They sell 942 af (372 af + 570 af) per year and it costs them \$2.95 million per year for O&M at the plant. The cost to produce 1 af is \$2.95 million divided by 942 af, which is \$3132/af.
  - 4 percent (\$117.31/\$3,132) of the rate recovers the actual cost to produce RW.
5. Does this rate cover renewal and replacement costs, or just treatment costs?
- The 20" 2 mile pipeline is fairly new and has not required maintenance.
6. What types of partnerships have you formed to implement your recycled water program? Is your project a joint project with a neighboring agency?
- Studies have been performed to see if a joint authority can exist between Windsor, Santa Rosa, and SCWA.
  - Mutual Aid agreement exists between Santa Rosa and Windsor to transfer water back and forth under an emergency.
  - Agreement with SCWA.
  - They are currently looking for a partner to help fund for storage.
7. Did you receive any grant funding or low-interest loans to implement your recycled water program?
- Unknown.
8. Who predominantly paid for the recycled water infrastructure? Existing rate payers or new development?
- Rate payers and developers.
9. What is the estimated cost of the recycled water supply per acre-foot?
- \$3,200/af

10. Is there a recycled water system “connection fee” as well?

- No connection fees.
- The new customers need to pay for their own infrastructure and permits to connect.

11. Did you conduct a feasibility study for the project?

- 1990 Master Plan and 2001 EIR and supplements.

12. Was a recycled water master plan prepared? If so, when in project development did it occur?

- 1990 Master Plan and 2001 EIR and supplements.

13. What were the biggest hurdles that your agency faced when implementing your recycled water program?

- There was a period when SCRWB and Windsor were beginning their relationship and it was little rough but that was a short period of time and they now work well with SCRWB.
- Convincing agricultural users to switch to RW.

14. What is preventing or limiting your agency from selling more recycled water supplies?

- Cost
- Permits
- Restrictive regulations

15. What advice would you give to an agency just getting into the recycled water business?

- Not to under-estimate weather vulnerability. Give flexibility to weather variability to water balance models.

**Recycled Water Retailer:** MRWPCA

**Date:** October 17, 2008

**Interviewee(s):** Karen Harris, Community Relations Specialist

1. What types of recycled water uses does your agency currently serve (or plan to serve in the future) and what level of treatment is provided for each type of use?

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2007)	Projected Use (2010)	Secondary	Tertiary
Agricultural Irrigation	13,331 af/yr	13,331 af/yr		X
Total Annual Recycled Water Use	13,331 af/yr	13,331 af/yr		X
Total Annual Wastewater Flow	24,640 af/yr <sup>1</sup>	24,640 af/yr		

- They only have agricultural customers.
- For 2006-2007, the agricultural water demand was 21,093 af. Of that, 14,107 af was recycled water. The remainder is from the 21 supplemental wells required to meet demands.
- For 2007-2008, the agricultural water demand was 21,000 af, which 13,331 af was recycled water.

2. What was the driving force to get your agency interested in and committed to the use of recycled water for non-potable water use?

- Seawater intrusion was threatening the billion-dollar agricultural business
- Protect the Monterey Bay

<sup>1</sup> 24,640 af/yr receives secondary treatment.

3. What is the current recycled water demand within your service area? Do you anticipate that the demand will increase in the future? If so, what is the projected future demand for recycled water in your service area?
  - See above
  - At this time, with current infrastructure, there will no be future increases in demand as they do not have enough waste water to treat.
  - There are currently three infrastructure projects that are being developed. Approval of any one of these developments would increase demands.
  - Not yet known.
  
4. What types of pricing strategies or incentives have you implemented to encourage use of recycled water? What is the sale price of your recycled water? Approximately what percent of the actual cost to produce this level of treated water is recovered by this rate?
  - No incentives are provided to encourage recycled water use. Their agricultural customers do not have any other water alternative. It is either recycled water or seawater-intruded groundwater.
  - \$267.94/acre/yr plus \$18.70/af, which is the average rate for all agricultural users. This breaks down to \$153/af or \$469/MG with a minimum 2.0 af/acre usage.
  - MRWPCA calculated that it costs about \$130/af to run a well.
  
5. Does this rate cover renewal and replacement costs, or just treatment costs?
  - Repairs and maintenance.
  - Capital outlay.
  - Equipment replacement.
  
6. What types of partnerships have you formed to implement your recycled water program? Is your project a joint project with a neighboring agency?
  - MRWPCA is a non-profit public agency, governed by a board of twelve directors, one from each of the areas served. MRWPCA owns the SVRP. MRWPCA operates the SVRP and SSIP for MCWRA.
  - Monterey County Water Resources Agency (MCWRA) is part of County government with a board of nine directors under the Board of Supervisors. They own the CSIP.
  - See above.

7. Did you receive any grant funding or low-interest loans to implement your recycled water program?
  - They have two revolving loans: one with the Bureau of Reclamation and the other with the State Water Resources Control Board.
8. Who predominantly paid for the recycled water infrastructure? Existing rate payers or new development?
  - The overlies.
9. What is the estimated cost of the recycled water supply per acre-foot?
  - They retail RW for \$153/af to agricultural customers.
10. Is there a recycled water system “connection fee” as well?
  - They only supply to agricultural customers so there really isn’t a new customer base.
11. Did you conduct a feasibility study for the project?
  - MWRSA Report
12. Was a recycled water master plan prepared? If so, when in project development did it occur?
  - Uncertain, but might be in Monterey County General Plan.
13. What were the biggest hurdles that your agency faced when implementing your recycled water program?
  - Public confidence
  - Perception issues
14. What is preventing or limiting your agency from selling more recycled water supplies?
  - Not enough water to recycle with current infrastructure.
  - They do not treat water 365 days per year.
  - Expansion of services (other recycled water uses) becomes a difficult expansion as it gets political and funding is messy.
  - Their plant is at 29.6 MGD and they are currently doing 21 MGD now.
15. What advice would you give to an agency just getting into the recycled water business?
  - Work with stakeholders.

**EXTRA NOTES:**

1. *Water Orders: Agricultural customers do daily water orders for the next day. This allows MRWPCA to plan for their demands.*
2. *They have a 80 af holding pond, which is roughly a day's worth of supply. This acts as a buffer.*
3. *2008-09 budget is 5.5 million.*
  - a) *3.7 million goes to O&M, wells, staff, and lab work*
  - b) *1.8 million goes loan repayment to the Bureau of Reclamation and State Water Resources Control Board.*

**Recycled Water Wholesaler:** Orange County Water District

**Date:** November 17, 2008

**Interviewee(s):** David Youngblood, Director of Engineering

1. What types of recycled water uses does your agency currently serve (or plan to serve in the future) and what level of treatment is provided for each type of use?

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2007)	Projected Use (2010)	Secondary	Tertiary
Landscape Irrigation & Industrial	6,720 af/yr	6,720 af/yr		X
Groundwater Recharge	51,520 af/yr	129,920 af/yr		X
Seawater Barrier	26,880 af/yr	26,880 af/yr		X
Total Annual Recycled Water Use	85,120 af/yr	163,520 af/yr		X
Total Annual Wastewater Flow	NA <sup>1</sup>	NA		

2. What was the driving force to get your agency interested in and committed to the use of recycled water for non-potable (and potable) water use?

- To protect and replenish the groundwater basin.
- To increase production of aquifer.

3. What is the current recycled water demand within your service area? Do you anticipate that the demand will increase in the future? If so, what is the projected future demand for recycled water in your service area?

- 6 mgd to Green Acres Project (GAP).
- 70 mgd to Groundwater Replenishment System (GWRS).
- Of the 70 mgd from the GWRS, 24 mgd goes to the sea-water barrier and the remainder gets routed to the Spread Basin in Anaheim for percolation to groundwater basin.

<sup>1</sup> OCWD purifies all treated wastewater received from OCSD.

- Within the next three (3) years, OCWD will increase production of the GWRS by 15 mgd to 85 mgd.
  - GWRS has an ultimate capacity of 140 mgd.
4. What types of pricing strategies or incentives have you implemented to encourage use of recycled water? What is the sale price of your recycled water? Approximately what percent of the actual cost to produce this level of treated water is recovered by this rate?
- OCWD wholesales GAP supplies to local agencies, who then sell it retail.
  - GWRS supplies are not directly sold. It is used in seawater barrier and groundwater replenishment.
  - The cost of water is estimated as \$700/af without subsidies, and approximately \$550/af with subsidies.
  - OCWD receives a subsidy of \$121/af from Metropolitan Water District's Local Resource Plan. This plan gives out subsidies to agencies that produce alternative sources of water.
  - MWD water supplies currently cost the City of Anaheim \$640/af.
  - Currently the cost of recycled water is \$260/af.
  - OCWD sells 250,000 af of water.
  - Recycled water accounts for only 20 percent of 250,000 af.
  - The cost of recycled water is absorbed by the remaining 80 percent of water supplies sold.
5. Does this rate cover renewal and replacement costs, or just treatment costs?

Did not discuss.

6. What types of partnerships have you formed to implement your recycled water program? Is your project a joint project with a neighboring agency?
- Agreement with OCSA, Orange County Sanitation District, in order to provide source water for treatment.
7. Did you receive any grant funding or low-interest loans to implement your recycled water program?
- OCWD has State revolving fund loan.
  - OCWD received grant money from the State.

8. Who predominantly paid for the recycled water infrastructure? Existing rate payers or new development?
- OCWD & OCSD
  - Existing rate payers paid for water infrastructure indirectly through rates.
9. What is the estimated cost of the recycled water supply per acre-foot?
- Cost for GAP supplies is unknown.
  - \$550/af after subsidies for the GWRS supplies.
10. Is there a recycled water system “connection fee” as well?
- No “connection fee” since water retailers pump groundwater basin for water withdrawal.
11. Did you conduct a feasibility study for the project?
- A feasibility study was conducted 10-12 years prior to construction.
  - Construction started in 2004 and was completed in 2008.
12. Was a recycled water master plan prepared? If so, when in project development did it occur?
- Water master plans normally entail pipelines, tanks, and wells. OCWD did not prepare a water master plan because groundwater is directly replenished and no direct transmission of water occurs.
13. What were the biggest hurdles that your agency faced when implementing your recycled water program?
- Public outreach with local groups and regulators.
  - Local groups include Kiwanis and Rotary Clubs.
14. What is preventing or limiting your agency from selling more recycled water supplies?
- Lack of wastewater to reclaim.
15. What advice would you give to an agency just getting into the recycled water business?
- Emphasize on public outreach as the City of Los Angeles was not able to move forward with their own project due to negative perception of indirect potable water reuse.

**Recycled Water Retailer:** Inland Empire Utilities Agency

**Date:** December 16, 2008

**Interviewee:** Sylvie Lee (via email)

1. What types of recycled water uses does your agency currently serve (or plan to serve in the future) and what level of treatment is provided for each type of use?

Type of Use	Recycled Water Use		Level of Treatment	
	Now (2007)	Projected Use (2011-2012)	Secondary	Tertiary
Landscape Irrigation,	20,600 af/yr	50,000 af/yr		X
Agricultural Irrigation				X
Industrial or Other Non Potable				X
Groundwater Recharge				X
Wetlands Restoration				X
<b>Total Annual Recycled Water Use</b>	20,600 af/yr	50,000 af/yr		X
<b>Total Annual Wastewater Flow</b>	67,200 af/yr	67,200 af/yr		

2. What was the driving force to get your agency interested in and committed to the use of recycled water for non-potable water use?

- This program was put into place to enhance water supply reliability and to improve drinking water quality throughout the greater Chino Basin.

3. What is the current recycled water demand within your service area? Do you anticipate that the demand will increase in the future? If so, what is the projected future demand for recycled water in your service area?

- Connected capacity 20,600 af/yr.
- Connected capacity was 13,600 af approximately two to three years ago.
- Yes, we have anticipated the growth of recycled water within our serving areas.
- By the FY 2011/12 our goal is to have 50,000 af/yr recycled water connected.

4. What types of pricing strategies or incentives have you implemented to encourage use of recycled water? What is the sale price of your recycled water? Approximately what percent of the actual cost to produce this level of treated water is recovered by this rate?

- Price incentives for the brine line customers
- Retail agencies offer recycled water at a discount of 10 – 25% of potable water rates
- \$66/ af/yr. It is anticipated to go up to \$75 - \$80/af/yr by Jan 2010.

5. Does this rate cover renewal and replacement costs, or just treatment costs?
  - Covers capital, O&M, some replacement and rate stabilization.
  
6. What types of partnerships have you formed to implement your recycled water program? Is your project a joint project with a neighboring agency?
  - IEUA provides our services to the Cities of Chino, Chino Hills, Fontana, Montclair, Ontario, and Upland as well as to the Cucamonga Valley and Monte Vista Water Districts and the Water Facilities Authority. Working with them to provide the services that they need from loan programs, support for retrofit, design and construction.
  - This is not a joint project with a neighboring agency
  
7. Did you receive any grant funding or low-interest loans to implement your recycled water program?
  - Yes we received grant funding to implement the recycled water program. DWR Grants, USBR Grants, State Revolving Funds (SRF)
  
8. Who predominantly paid for the recycled water infrastructure? Existing rate payers or new development?
  - IEUA with SRF Loans
  
9. What is the estimated cost of the recycled water supply per acre-foot?
  - Currently it is \$66/af
  - IEUA will increase the rates to \$72-\$80/af by 2010 and may further increase rates to \$115/af further down the road.
  
10. Is there a recycled water system “connection fee” as well?
  - We supply the surrounding agencies with recycled water; we leave it up to the agencies to charge for a connection fee.
  
11. Did you conduct a feasibility study for the project?
  - In November 2000, IEUA conducted a feasibility study.
  
12. Was a recycled water master plan prepared? If so, when in project development did it occur?
  - IEUA has prepared a Recycled Water master plan, which has also received a Recycled Water plan from the local agencies.
  - 2005
  
13. What were the biggest hurdles that your agency faced when implementing your recycled water program?
  - The cost of the capital program – the cost of the laterals and retrofits and having to find funding sources.

14. What is preventing or limiting your agency from selling more recycled water supplies?

- Regional facilities to complete the infrastructure to serve the entire service area. It is currently in the process, and is expected to be completed by FY 2011/12.

15. What advice would you give to an agency just getting into the recycled water business?

- Set up the funding/financing plan and strategy on connecting the individual customers so that there is water flowing through the meter.