

SEWER AUTHORITY MID-COASTSIDE
Staff Report

Subject / Title

Receive and File Recycled Water Study Progress Report

Staff Recommendation:

Receive and File Recycled Water Study Progress Report

Fiscal Impact:

None.

Discussion/Report:

In May 2008, the Board authorized a Recycled Water Study. Since that time the Manager and SAM staff have met with stakeholders and worked closely with SRT Consultants on this study.

Attached is the progress report for the Board's review. Tanya Yurovsky of SRT Consultants will be present at the meeting to give a presentation on the status of the project, discuss the report in more detail, discuss proposed next steps, and answer any questions the Board may have.

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Memorandum

DATE: July 23, 2008

TO: John F. Foley III, Manager, Sewer Authority Mid-Coastside

FROM: Tanya Yurovsky, P.E., SRT Consultants

SUBJECT: Recycled Water Study Progress Report

Purpose

The Sewer Authority Mid-Coastside (SAM) contracted SRT Consultants to prepare the Recycled Water Study (Study) with the goal of investigating the potential market for recycled water in the Midcoast Region. The purpose of this memorandum and the discussion below is to provide a progress report of the work completed to date and the proposed next steps, and solicit input from the SAM Board on several key issues.

Recycled Water Project Objectives

The Recycled Water Project objectives include the following:

1. Utilize SAM's Wastewater Treatment Plant (WWTP), a valuable Midcoast water resource, for the benefit of the region;
2. Facilitate reduction of water draw on local aquifers; and
3. Facilitate reduction in ocean discharge of treated wastewater.

SAM's Recycled Water Project will diversify the current Midcoast water supply portfolio and help create a more sustainable watershed by reducing the region's dependency on imported water and improving the region's water supply reliability, affordability, and management. In addition, the reductions in water draw and in ocean discharge may potentially help improve creek flows in Pilarcitos creek, restore aquatic habitat, and support the coastal environment of the Midcoast Region.

SAM Goals

As an agency, SAM is interested in pursuing the project to both maintain its position in environmental stewardship on the Midcoast by utilizing its WWTP effluent, a valuable water resource, for the benefit of the region and to financially balance its other necessary capital improvement projects. To effectively address the Recycled Water Project objective and accomplish its goals, SAM has agreed to partner with other Midcoast agencies to balance the beneficial uses of the available water resources in the Pilarcitos Creek watershed by finding solutions that satisfy environmental, agricultural, public health, and economic interests.

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Discussion

Currently, the Midcoast Region uses over 1.2 million gallons per day (mgd) of potable water for irrigation purposes. Some of this potable water is drawn from wells and withered creeks in the region, while supplemental water is purchased from Coastside County Water District (CCWD).

SAM has the potential to produce recycled water that can serve the needs of irrigation customers in the Midcoast region. Since irrigation water is normally supplied during the dry season by wells or Coastside County Water District (CCWD), the average flow used when evaluating the feasibility of the SAM Recycled Water Facility is the average daily dry weather flow (ADDF). The SAM WWTP is designed to handle an ADDF of 4.0 mgd, but the current ADDF is 1.65 mgd. The proposed Recycled Water Facility will be sized to treat the ADDF to irrigation quality, and can serve irrigation water customers with a combined demand of approximately 1.65 mgd.

Potential Customers

Potential recycled water customers in the Midcoast region have been identified by SAM Board. In order to effectively market recycled water to each potential customer, their current irrigation demands, water supply arrangement, and potential benefits are being evaluated in this study. In addition, the feasibility and cost effectiveness of connecting each customer to the recycled water source need to be established. SRT is presently in communication with the following customers regarding their water needs, infrastructure requirements, and level of interest: Nurserymen's Exchange, Ocean Colony Golf Courses, Skylawn Memorial Park Cemetery, Giusti Farms, Bay City Flower Company, and Daylight Farms.

A draft potential customer database has been developed based on a comprehensive questionnaire, which acts as a basic guide for obtaining information from the potential customers. The draft potential customer database is attached to this memorandum as Exhibit A. A decision tool is also being developed to define the most feasible potential customers, based on the information gathered for the database. The decision tool will evaluate the potential customers based on their performance in the following categories:

Feasibility of the customer connection, including the proximity of the land to the treatment plant, the constructability of the potential infrastructure, the motivation of the customer, and potential differential between the cost per acre-foot of their current source and the cost per acre-foot of the recycled water.

Probable Cost per acre-foot of delivering the recycled water, inclusive of infrastructure and treatment costs for each potential customer.

Environmental Benefits that the customer connection potentially provides by using recycled water, a drought resistant supply, in place of local groundwater supply and/or imported water. These actions will potentially recharge Pilarcitos aquifer and help restore Pilarcitos Creek and its aquatic habitats.

Irrigation Water supply and demand will be evaluated for each potential customer by considering the amount of water needed, the current water source used, the months that irrigation water is used, and the on-site storage potential for recycled water.

Stakeholder Communication and Updates

Since there are several different public, governmental, and private entities with stakes in the Recycled Water Project, it is important to stay current with all parties and understand their desired level of participation. SRT has been communicating with CCWD, Pilarcitos Creek Restoration Workgroup, San Mateo County Resource Conservation District (RCD), San Francisco Public Utilities Commission (SFPUC), and the San Mateo County Farm Bureau to better understand their respective interests in being involved in the Recycled Water Project.

Public Outreach

The Board directed that a public workshop to inform the public about the Recycled Water Study must be conducted before the end of November 2008. The focus of this workshop has been broken down into general public concerns and potential customer concerns, as both groups will be invited to participate in the workshop and express their concerns.

It is anticipated that public concerns will include, but are not limited to: short-term and long-term health impacts, pharmaceuticals and personal care products, level of disinfection, and environmental benefits. It is anticipated that customer concerns will include, but are not limited to: water quality, water quantity, cost, mode of delivery, reliability, storage availability, and public opinion of recycled water use on their crops.

A tentative date for the public workshop is being proposed for the middle of September 2008 to maximize participation of all parties and the public.

Funding Alternatives

The funding of this multi-million dollar project may come from several different sources. All funding options will be explored, and the best combination of funding sources will be pursued to meet the project budget.

Rate Revenues

Rate revenues will be collected from recycled water customers that are directly connected to the SAM recycled water supply. An economic evaluation will need to be conducted to establish a rate that is reasonable for customers.

Capital Facility Charges

Capital facility charges, or capacity charges, are the charges that new customers must pay to “buy in” to the recycled water facilities. Capital facility charges will vary depending on the size of the connection to the recycled water system and the delivery system required to serve each customer.

Grants

Grant funding can be acquired by SAM from many different sources. There are State funds dedicated to water conservation, water use efficiency, water reclamation projects, and the protection of beaches, bays, and coastal waters along the California Coastline. The following grants are opportunities identified that may be consistent with the SAM Recycled Water Project objectives:

- ***Clean Beaches Initiative Grant Program (CBI)***
The CBI grant awards grants to help local agencies, non-profit organizations, and public agencies implement projects that protect and restore California’s coastal water quality. This grant is potentially suitable for the SAM project because the recycled water facility will significantly reduce the amount of effluent being released into the ocean from the current outfall of the SAM WWTP.
- ***The Water Recycling Funding Program (WRFP)***
The WRFP manages all State Water Board grants and loans for the design and construction of recycled water projects. The grant monies that may be available for the design and construction of the SAM recycled water project are outlined below:
 - (a) **Water Recycling Construction Program (WRCP)**
The WRCP provides grants to eligible applicants for the design and construction of water recycling facilities. Applications are accepted on a continuous basis, however very limited grant funding is available. The available funding is distributed to projects that meet the requirements of the WRCP Guidelines and are immediately ready to proceed to construction.

- (b) Water Recycling Facilities Planning Grant Program (FPGP)
The FPGP provides grants up to \$75,000 to study the feasibility of water recycling and to prepare facilities plan documenting the analyses and conclusions of the investigation. Applications are accepted on a continuous basis.

Debt Instruments

A debt instrument is a promise to repay in accordance with terms of a contract. Types of debt instruments include loans, bonds, certificates, leases or other agreements between a lender and a borrower. Although SAM is attempting to acquire the funding necessary for the project through grants, rate revenue, and capital facility charges, it will most likely be necessary for SAM to borrow money to cover the remaining cost of the project. SAM has the following options:

- *State Revolving Fund (SRF)*
SRF lends \$200-\$300 million dollars annually for the construction of facilities or implementation of measures necessary to address water quality problems and to prevent water pollution.
- *California Infrastructure and Economic Development Bank (I-Bank)*
The I-Bank administers funds from the Infrastructure State Revolving Fund (ISRF) Program, which provides low-cost financing to public agencies for a wide variety of infrastructure projects.

Capital Funds

SAM may utilize some of its capital funds to initially fund the Recycled Water Project. These funds would have to be re-paid through recycled water rate revenues.

State Recycled Water Policy

The State Water Resources Control Board (SWRCB or Board) is in the process of developing a statewide Recycled Water Policy (Policy) to establish more uniform requirements for recycled water projects. The SWRCB released the Recycled Water Policy in March 2008 and received many comments, causing the Board to completely reevaluate the Policy. In May 2008, the Board tasked a group of stakeholders to create their own statewide Recycled Water Policy, to be presented at a public meeting and potentially be approved by the SWRCB. A status update from the stakeholder group regarding the alternative proposal for the Recycled Water Policy was presented to the SWRCB on July 15, 2008.

The SWRCB is also in the process of developing a statewide general permit for landscape irrigation uses of recycled water. New law, California Water Code section 13552.51, requires the State Water Board to adopt the General Permit by July 30, 2009. The intent of the new law is to develop a uniform interpretation of state standards to ensure the safe, reliable use of recycled water for landscape

state standards to ensure the safe, reliable use of recycled water for landscape irrigation uses, consistent with state and federal water quality law. The new law is also intended to expedite permitting for use of recycled water for landscape irrigation. On June 18, 2008, the SWRCB held a workshop and CEQA scoping meeting, where staff provided a description of the General Permit adoption process and its schedule. Staff also presented an overview of the regulatory and technical issues associated with landscape irrigation uses of recycled water and discussed the potential elements of the General Permit. The meeting participants had an opportunity to provide comments regarding the appropriate scope and content of the General Permit and the environmental documents to be prepared pursuant to CEQA. There was no action taken as a result of this meeting. No draft of the permit is available at this time, but electronic versions of the presentations and comments are presently available on line at:

www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/landscape_irrigation_general_permit.shtml

Pharmaceuticals and Personal Care Products

Endocrine disrupting compounds (EDCs) and pharmaceuticals and personal care products (PPCPs) are not unique to recycled water, but ubiquitous to most water supply and wastewater sources. Even though these compounds are found in all surface and groundwater supplies, their possible presence in recycled water has been often cited as a reason for public opposition to a recycled water project, typically potable use projects. However, it is often overlooked that trace amounts (parts per million to parts per billion) of EDCs and PPCPs are found in many other potable water supply sources, including rivers and reservoirs, as these sources are often the drainage points of treated wastewater and surface water runoff, respectively. Regardless, the public is concerned with the human health risks associated with the potential EDCs and PPCPs in recycled water, and to what degree the recycled water should be treated to minimize potential health risks. Current information human health risks and effectiveness of treatment technologies is summarized below for the benefit of the SAM Board.

Human Health Risks

To date, there is no firm evidence for a causal association between low-level exposure to EDCs and PPCPs and adverse human health outcomes. Significant research supports that response to endocrine disruptors is dose/potency related: there is a 'no-effect' threshold. In laboratory studies, high doses are required to give weak hormone activity, and these doses are not likely to be encountered in the environment. With respect to humans, there are no convincing studies that show that any adverse hormone related effects are occurring. Epidemiological evidence does not support such a link, although isolated studies may be interpreted that way. The suggestions that many human reproductive changes are a result of environmental contaminants are not based on a significant body of scientific findings. Consequently, EPA and other federal and state agencies will

continue to provide substantial funding for research to better understand the risks posed by endocrine disruptors.

Most research being conducted regarding EDCs and PPCPs is in regard to trace concentrations present in recycled water to be treated and used as potable water. Recharging aquifers and blending recycled water with non-recycled water sources have been identified as the main concern of the public and potential customers in studies focused on the trace contaminants. Since recycled water used for irrigation is not consumed by humans, trace concentrations of EDCs and PPCPs have not been considered a serious risk to end users or the public and have not been studied extensively.

Advanced Treatment for EDCs and PPCPs

It is not typical for a recycled water irrigation facility to invest in technologies for high efficiency removal of EDCs and PPCPs, but there are treatment options available that will provide this degree of removal, if desired. Recycled water used for irrigation must meet all irrigation water requirements for parameters such as salt content, sodium adsorption ratio, and trace elements. Statewide regulations regarding the quality requirements of recycled water (for both potable and non-potable uses) are currently being drafted.

An American Water Works Association Research Foundation (AWWARF) study, published in 2007, evaluated conventional and advanced treatment processes for removal of EDCs and Pharmaceuticals and Personal Care Products (PPCPs). The study resulted in several conclusions on the effectiveness of tertiary treatments and various forms of disinfection for the specific effluent analyzed. Since the study focused on several target analytes that were present in the study-specific effluent, not all of the results may be pertinent to SAM's effluent. In order to establish the most effective EDC and PPCP removal technologies for the SAM tertiary treatment facility, it would be necessary to analyze EDC and PPCP concentrations in the effluent of the SAM secondary treatment facility. A summary of the results from the AWWARF study are summarized in the table below.

Treatment Technology	Type of Treatment	Effectiveness in Removing EDCs and PPCPs
Activated Carbon	Tertiary	Highly effective for removal of target analytes
Reverse Osmosis	Tertiary	Highly effective for removal of all EDCs and PPCPs
Nanofiltration	Tertiary	Highly effective for removal of all EDCs and PPCPs

Ultrafiltration/ Microfiltration	Tertiary	Largely ineffective for removal of EDCs and PPCPs
Chlorination	Disinfection	Free chlorine is effective in the removal of many target compounds, depending on the structure of the contaminant
Ozone	Disinfection	Much more effective than free chlorine, and is able to remove the majority of target analytes
Ultraviolet (UV) Radiation	Disinfection	UV is ineffective for removal of most EDCs and PPCPs at typical disinfection doses; high energy oxidative doses, however, can be highly effective

Treatment trains combining various advanced processes are the most effective for removing trace concentrations of EDCs and PPCPs.

Preliminary Findings

Although the findings of the Recycled Water Study regarding the evaluation of potential customers and project funding alternatives are yet to be finalized, several important preliminary findings have been made, including:

1. An agreement to cooperate in treating and distributing the recycled water must be made between SAM and CCWD, or an Irrigation District comprised of recycled water users must be formed. The option of SAM distributing the recycled water has been considered and it appears improbable.
2. Potential customers interviewed for the purpose of this study currently have a high level of interest in recycled water. Customers are particularly motivated due to the following anticipated economic and environmental benefits of the Recycled Water Project:
 - Recycled water is a more drought resistant and affordable source for irrigation water users. Several potential customers do not currently have access to a reliable and affordable water source.
 - Recycled water availability will improve the economic sustainability of the Midcoast as two of the customers are the region's largest employers and their reliance on imported, expensive water will be reduced.

- The environmental sustainability of the Midcoast will be improved by reducing reliance on local aquifers, potentially recharging the aquifers and restoring flows and aquatic life in Pilarcitos Creek.

Next Steps and Key Issues

The next steps of the Recycled Water Study include continuing communication with all potential customers, facilitating a public workshop, creating an effective decision tool to determine the most feasible recycled water customers, and establishing different alternatives for funding the project. In addition, SRT will continue keeping the Board informed on new governmental developments regarding the Recycled Water Policy and scientific and media developments regarding the EDCs.

Receiving Board's input on several key issues will be beneficial to the successful completion of this study. There appear to be several possible ways in which agencies can cooperate for the Recycled Water Project implementation:

1. A joint agreement between SAM and CCWD entering into a partnership to develop and sell recycled water to retail customers.
2. SAM treats water and sells the water to CCWD as a wholesale customer, CCWD re-sells to retail customers.
3. An Irrigation District is formed by recycled water users and SAM sells water to the Irrigation District as a wholesale customer. The Irrigation District re-sells water to retail customers.

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Customer	Contact	Teleconference	Jurisdiction	Pipeline Length	Pipeline Details	Elevation	Total Acreage	Irrigated Acreage	Desired Level of Treatment	Current Water Provider/Price	Number of Wells/Rate	Number of Reservoirs/Capacity	Daily Peak Usage Rate	Average Usage Rate	Peak Usage Rate	Total Average Cost
Nurserymen's Exchange 2651 Cabrillo Hwy N Half Moon Bay, CA 94019	Don Mendel <i>Company Counsel</i> (650) 712-4236 dmendel@bloomrite.com Ray Gonzales <i>Manager</i> (650) 712-4185	COMPLETED Finishing Questionnaire Sent 7/3/08	City & County	<u>Main Lot</u> = 1.75 miles <u>Lot 2</u> = 3.0 miles	<u>Shared Pipeline w/ Skylawn:</u> Crossing - Hwy 1 Crossing - Frenchman's Creek	<u>Main Lot</u> = 80 ft <u>Lot 2</u> = 83 ft	~ 120 acres		Possibly higher treatment needed Dual piping possible	CCWD \$1907.93/ac-ft \$4.38 hcf			0.18 mgd		200 ac-ft/yr	\$381,586/yr
Ocean Colony Golf Course Two Miramontes Point Rd Half Moon Bay, CA 94019	Mark Kendall <i>Kenmark Group</i> (650) 726-5764 HMB Office (415) 515-3660 CELL	COMPLETED	City	<u>SAM to Well Field</u> = 0.15 miles <u>Wells to Golf Course</u> = 2.15 miles	<u>SAM to Well Field:</u> Crossing - Pilarcitos Creek <u>Wells to Golf Course:</u> Existing Pipeline (6in diameter)	<u>Well Field</u> = 24 ft <u>Golf Course</u> = 67 ft	~ 500 acres	~ 250 acres	Tertiary	CCWD \$1907.93/ac-ft \$4.38 hcf	5 wells	5 ponds	0.5 mgd NEEDED	?ac-ft/yr	CCWD 60 ac-ft/yr Dry weather	\$114,475.8 Dry weather
Skylawn Memorial Park Cemetary 10600 Skyline Blvd Redwood City, CA 94062	Andy Bryant <i>Lifemark Group</i> (510) 441-5551 abryant@lifemarkgroup.com	COMPLETED	County	6.5 miles	<u>Shared Pipeline w/ Nurserymen's Main Lot:</u> Crossing - Hwy 1 Crossing - Pilarcitos Creek Construction - Along Hwy 92	1100 ft	~ 280 acres	85 acres 7 acres future	Tertiary	CCWD \$2173.64/ac-ft \$4.99 hcf	1 potable well 1 agri well = 12gpm	1 reservoir = 3.9 MG 1 tank = 100,000 gal	0.14 mgd	128 ac-ft/yr	154 ac-ft/yr	\$278,225.92/yr
Bay City Flower Company 2265 Cabrillo Hwy. S Half Moon Bay, CA 94109	Don McCahon (650) 720-2023 don.mccahon@baycityflower.com	COMPLETED Finishing Questionnaire Sent 7/10/08	County	3.15 miles	<u>Shared Pipeline w/ Giusti & Nurserymen's Lot 2:</u> Tie-in - Ocean Colony Pipeline Crossing - Hwy 1 Construction - Along Hwy 1	85 ft	~ 65 acres		Tertiary	CCWD \$1907.93/ac-ft \$4.38 hcf	N/A	1 collection pond	0.09 mgd		100 ac-ft/yr	\$190,793/yr
Daylight Farms 850 Cabrillo Hwy N Half Moon Bay, CA 94019	John Muller (650) 464-8226 CELL farmerjohnmull@aol.com	Monday 7/21/08 10:00 am	City	0.25 miles	Directly adjacent to SAM	23 ft	~ 30 acres									
Giusti Farms 1800 Higgins Canyon Rd Half Moon Bay, CA 94019	John Giusti (650) 726-9221	COMPLETED	County	2.75 miles	<u>Shared Pipeline w/ Bay City & Nurserymen's Lot 2:</u> Tie-in - Ocean Colony Pipeline Crossing - Hwy 1	90 ft	180 acres	80 acres	Tertiary	Self	2 wells Total = 50 gpm	2 reservoirs = 49 ac-ft & 5 ac-ft	0.06 mgd	37 ac-ft/yr to 49 ac-ft/yr	66 ac-ft/yr	-