DRAFT Technical Memorandum No. 2

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Technical Memorandum No. 2

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1. INTRODUCTION

1.1 Recycled Water Study Overview

This Technical Memorandum (TM) was developed as part of the City of San Diego's (City) Recycled Water Study (RWS or Study). The purpose of the RWS is to maximize recycling of the City's wastewater to the fullest extent practicable to offset potable water demands as well as determine to what extent such recycling and reclamation could feasibly offload wastewater flows now delivered to the Point Loma Wastewater Treatment Plant (PLWTP). The Study will identify opportunities to increase recycling and reclamation of wastewater for both indirect potable reuse (IPR) and non-potable reuse (NPR). Additional goals include identification and evaluation of recycling alternatives that would result in the following: upgrading the existing PLWTP to secondary treatment at the lowest total cost, maximizing recycling of the City's wastewater to the fullest extent practicable, and evaluating opportunities to increase recycled water reuse as satellite facilities or as a regional recycled water agency using wastewater generated by the Participating Agencies (PAs) of the San Diego Metro Wastewater Joint Powers Authority (Metro Wastewater JPA) that share in the cost of the metropolitan sewerage system.

The RWS was initiated through a cooperative agreement with the City, the San Diego Coastkeeper, and the San Diego Chapter of the Surfrider Foundation as part of the City's application process for the City's newest waiver from secondary treatment standards for the PLWTP. The waiver allows the City to continue to operate the PLWTP as an advanced-primary treatment facility rather than requiring an upgrade to secondary treatment. The City's responsibility per the Agreement is to execute this RWS.

In addition, the RWS is being completed to fulfill the requirements of San Diego Municipal Code (Chapter 6, Article 4, Division 8, Item 6), which requires that the City's adopted Water Reclamation Master Plan (Master Plan) be updated every five years. The requirements of the Master Plan include an evaluation of plants and facilities, designating reclaimed water service areas, designating tributary areas, evaluating the quality of the water to be reclaimed, recommendations for tributary protection measures, and an implementation schedule. The City of San Diego Recycled Water Master Plan Update 2005, which was completed in September 2005, was the last update to the City's Master Plan.

The RWS is being carried out as a series of TMs that serve as the principal building blocks for the project. The RWS will conclude with the Final Report, which will be a compilation of the TMs. The TMs are being completed in a sequence to provide decisions and directions for subsequent tasks, TMs, and/or activities along the course of the RWS. Furthermore, each draft TM will be reviewed, and comments will be addressed and incorporated in the Final TM. The TMs included in the RWS are summarized in Table 1-1.

Table 1-1
Recycled Water Study Technical Memoranda

Task No.	TM No. and Name
3	TM 1 – Non-Potable Reuse Market Assessment
4	TM 2 – Regional Non-Potable Recycled Water Demand
5	TM 3 – Wastewater Characterization
6	TM 4 – Secondary Treatment at PLWTP
7	TM 5 – Concepts for Maximizing Recycling
8	TM 6 – Demand Scenarios
9	TM 7 – Potential Water and Wastewater Savings
10	TM 8 – Alternative Performance
11	TM 9 – Project Plan Development
12	TM 10 – Adaptive Program Implementation

1.2 TM Purpose

This Draft Regional Non-Potable Recycled Water Demand TM (TM 2) summarizes the potential regional recycled water demands that exist within the jurisdictions of the PAs within the Metro JPA that could be served with recycled water generated within the City. The intent of this task was to identify potential future recycled water demands from users other than those within the city of San Diego boundaries. Using the PA jurisdictions as the primary sphere of interest, a survey of water agencies operating within the PAs was performed to determine each jurisdiction's potential interest in wholesale purchase of recycled water from the City. Issues such as location, existing facilities and demand, future demand, and water quality concerns were reviewed.

TM 2 was completed as part of the overall NPR market assessment, which is being conducted to determine the potential NPR demands within the City and the PAs that could be served by the City's recycled water system. The market assessment within the City is presented in the Draft Non-Potable Reuse Market Assessment TM (TM 1). The NPR demands identified as part of TMs 1 and 2 will be combined with IPR project concepts as part of Task 7, Identify and Evaluate Concepts for Maximizing Recycling, which will evaluate potential new water reclamation facilities and distribution system alternatives to serve NPR and IPR demands. The NPR demands will be refined based on recycled water distribution system concepts that are developed as part of Task 7.

2. BACKGROUND INFORMATION

This section describes the PAs and other nearby water agencies that may be interested in purchasing reclaimed water from the City, and the existing recycled water system including the water agencies that currently purchase recycled water from the City.

2.1 Metro Wastewater JPA PAs and Other Interested Parties

The Metro Wastewater JPA is a coalition of twelve municipalities and special districts (the PAs) in San Diego County that share in the use of the City's regional wastewater system. The PAs are the cities of Chula Vista, Coronado, Del Mar, El Cajon, Imperial Beach, La Mesa, National City and Poway; the Lemon Grove Sanitation District; the Padre Dam Municipal and Otay Water Districts; and the County of San Diego (on behalf of the Winter Gardens Sewer Maintenance District, and the Alpine, Lakeside and Spring Valley Sanitation Districts) (Metro Wastewater JPA website, www.metrojpa.org, 2009). Since the PAs contribute wastewater to the City wastewater system, it was necessary to determine the interest within the PAs to purchase wholesale recycled water and to determine potential demands.

In addition, other nearby water agencies outside of the Metro Wastewater JPA that might be interested in purchasing water were surveyed, including the City of Escondido, Olivenhain Municipal Water District (OMWD), and Santa Fe Irrigation District (SFID).

The PAs provide wastewater services to their geographic areas, but are not necessarily the same agencies who provide potable water. In California, recycled water must be sold by a water purveyor (unless a special agreement is developed). Therefore, the water agencies within the PAs were surveyed since they are the agencies responsible for local sale of water to customers.

Table 2-1 summarizes the PAs and the water purveyors within their jurisdictions. Also included in this list are the other agencies that were thought to be interested in purchasing recycled water from the City.

Table 2-1
PAs and Associated Water Agencies

Participating Agencies	Water Agency
City of Chula Vista	Otay Water District (existing wholesale customer) South Bay Irrigation District (member of Sweetwater Authority)
City of Coronado	California American Water
City of Del Mar	City of Del Mar
City of El Cajon	Helix Water District
City of Imperial Beach	California American Water City of San Diego
City of La Mesa	Helix Water District
City of National City	City of National City (member of Sweetwater Authority)
City of Poway	City of Poway (existing wholesale customer)
Lemon Grove Sanitation District	Helix Water District
Otay Water District	Otay Water District (existing wholesale customer)
Padre Dam Municipal Water District	Padre Dam Municipal Water District
County of San Diego	
Lakeside/Alpine Sanitation District	Lakeside Water District Padre Dam Municipal Water District
Spring Valley Sanitation District	Otay Water District (existing wholesale customer)
Winter Gardens Sewer Maintenance District	Lakeside Water District
East Otay Sewer Maintenance District	Otay Water District (existing wholesale customer)
Other Interested Parties	City of Escondido
	Olivenhain Municipal Water District (existing wholesale customer)
	Santa Fe Irrigation District

2.2 Existing Recycled Water System and Wholesale Customers

As a component of the Metropolitan Wastewater System, San Diego operates two reclamation facilities. These include the North City Water Reclamation Plant (NCWRP), located near Interstate 805 and Miramar Road, and the South Bay Water Recycling Plant (SBWRP), located in the Tijuana River Valley near the border with Mexico. The NCWRP has the capacity to treat 30 million gallons per day (mgd). Currently, the plant is treating 22.5 mgd and in FY 2009 distributed 5,036 AF of recycled water to regional users (City of Poway and OMWD) and City recycled water customers via about 79 miles of distribution pipelines. The SBWRP has the capacity to treat 15 mgd and in FY 2009 distributed 3,906 AF of recycled water to Otay Water District (OMD) and City recycled water customers.

The City currently has three wholesale customers for recycled water: the City of Poway, OMWD, and OWD. Figure 2-1 shows the geographic locations of the PA's, the existing recycled water treatment facilities and the current connections to deliver recycled water to the three existing wholesale customers. Table 2-2 shows the current contracted and delivered amounts of recycled water for each agency. Further information on the recycled water programs for these agencies is included in Section 3.

Table 2-2
Current City of San Diego Recycled Water Wholesale Customers

Wholesale Customer	Source	Contracted AFY	FY2009 Delivered
City of Poway	NCWRP	750 AFY	554 AF
OMWD	NCWRP	400 AFY	267 AF
OWD	SBWRP	6,720 AFY	3,245 AF

Notes:
AFY = acre feet per year
AF = acre feet

3. REGIONAL RECYCLED WATER DEMAND

This section describes the survey that was distributed to the water agencies within the PAs to determine the estimated future regional recycled water demand within the PAs.

3.1 Description of Request for Information

A survey form was developed to collect information from the water agencies listed in Table 2-1. A total of 11 agencies were contacted and all agencies responded. Of the 11 water agencies, eight provide service within the jurisdiction of the Metro PA's and three provide service to areas outside the Metro Wastewater System. The questions included in the survey form were focused on the following issues:

- The current level of recycled water system planning within each jurisdiction,
- The current and future (2035) estimated recycled water use,
- Interest in purchasing recycled water from the City,
- Identification of prefered locations for connection to the the City system,
- Information on concerns about recycled water (quality, acceptance, reliability, etc.), and
- Indication of the agency's confidence that a recycled water system could be implemented within their jurisdiction.

Appendix A includes a sample survey form. Appendix B includes the responses to the survey from the water agencies.

3.2 Survey Results and Potential Wholesale Demand

Initial analysis of the survey responses indicates that the agencies fall within three main sub-groups. These are:

- Existing wholesale customers,
- Agencies with an interest in purchasing recycled water from the City, and
- Agencies with no interest in purchasing recycled water from the City.

These agencies are summarized in Table 3-1 and are discussed further in the following sections.

Table 3-1
Summary Survey Results

Existing Wholesale Customers	Potential Wholesale Customers	Agencies Unlikely to Become Wholesale Customers
City of Poway	Santa Fe Irrigation District	City of Del Mar
Olivenhain Municipal Water District	California American Water (City of Coronado)	City of Escondido
Otay Water District		Helix Water District
		Lakeside Water District.
		Padre Dam Municipal Water District
		Sweetwater Authority

3.2.1 Existing Wholesale Customers

Three agencies currently purchase recycled water from the City on a wholesale basis. Since the inter-agency service agreements, capital facilities and end user delivery systems are all in-place, these wholesale customers provide the potential for increasing the use of recycled water. The City's existing wholesale customers include the City of Poway, OMWD, and OWD.

City of Poway

The City of Poway has an existing purveyor agreement with the City to purchase up to 750 acre feet per year (AFY) for delivery to users for landscape irrigation within the area of Scripps Poway Business Park. The wholesale connection to the City's system is at Scripps Poway Parkway. In fiscal year (FY) 2009, Poway purchased 554 AF from the City. This level is consistent with the volumes purchased in previous years. While the existing agreement allows for an increase in the available supply of up to 1,200 AFY, additional service within the southern area would require the extension of distribution pipeline within the Poway service area to serve other users in the north. Concerns such as the capital cost of facilities and customer interest are some of the issues that may limit the expansion of the Poway system. In addition, Poway has expressed concern over water quality, specifically total dissolved solids (TDS) levels and availability.

Other potential high-use customers, such as golf courses in northern Poway, are in an area that would require construction of additional delivery pipelines. Poway has estimated that the irrigation customers in the northern area use approximately 1,100 AFY that could be converted to recycled water use. The City of San Diego Recycled Water Master Plan Update 2005 (PBS&J, September 2005) identified pipelines within this area as a component of the City's Phase III Recycled Water System Expansion into Rancho Bernardo. To date, construction of these facilities has been determined to be not cost effective for the volume of water that could be sold. Further investigation of opportunities to provide service to north Poway will be evaluated as a part of this current Study as part of Task 7, Identify and Evaluate Concepts for Maximizing Recycling.

Olivenhain Municipal Water District (OMWD)

The City has an agreement with OMWD to provide 0.36 mgd (400 AFY) of recycled water through 2024. The recycled water is used to provide irrigation water for four golf courses within the OMWD service area. In FY 2009, 267 AF of recycled water was delivered to OMWD from the NCWRP via a wholesale connection located along San Dieguito Road. The area served with the City's recycled water is in the southeast quadrant of the OMWD service area. Survey responses provided by OMWD indicate that while the current service area needs are being met with the existing agreement and supply, expansion of the current system and purchase of additional recycled water from the City would depend on the availability and reliability of recycled water and the cost of facilities and operations.

Otay Water District (OWD)

OWD currently provides recycled water service to the eastern portion of the city of Chula Vista and to the Otay Mesa area within the OWD jurisdiction. OWD operates the Ralph W. Chapman Water Recycling Facility (1.2 mgd capacity) and purchases recycled water from the City generated at the SBWRP. The City/OWD purchase agreement provides for sale of 6.0 mgd [6,720 AFY] from the SBWRP. In FY 2009, 3,245 AF was delivered to the OWD distribution system. In calendar year 2008, OWD reports that the annual system wide demand was 4,727 AF with a peak month demand of 657 AF.

OWD currently has over 600 existing customers and anticipates having more than 1,200 by build-out in 2035. OWD has indicated an interest in obtaining additional recycled water from the city from either the SBWRP or from facilities adjacent to it. Ultimate demand is estimated at 10,000 AFY in 2035.

Key concerns are water quality (limit of 1,000 ppm TDS) and wholesale cost of recycled water from the city. Survey responses indicate that OWD anticipates that an increase of tertiary capacity at the SBWRP to 21 mgd with 17 mgd identified to serve OWD would be required to meet their ultimate (or projected 2035) requirements (average and peak).

3.2.2 Potential Wholesale Customers

Survey responses provided by the following agencies indicated that their agencies have operating recycled water programs, or have completed some recycled water system planning, and there is some potential interest in purchase of wholesale water from the City. These agencies include SFID and California American Water (CAL-AM).

Santa Fe Irrigation District (SFID)

SFID is located in North County San Diego and provides water service to the City of Solana Beach, Rancho Santa Fe and Fairbanks Ranch (unincorporated areas of the County of San Diego). Currently, SFID provides 500 AFY of recycled water to 43 customers. Their current source of recycled water is the San Elijo Water Reclamation Facility.

SFID is evaluating service of recycled water to the agency's eastern service area and has considered purchasing recycled water from the City via the San Dieguito connection, either by agreement with the City or with OMWD. The estimated additional demand would be approximately 150 AFY. Further evaluation of the system hydraulic requirements and the inter-agency arrangements would be needed to further define the feasibility of provision of recycled water by the City.

California American Water (CAL-AM)

CAL-AM is a private water company that provides water services to the City of Coronado (Coronado) and the City of Imperial Beach. While there was no information specific to Imperial Beach, information from the City's Utilities Department staff indicated that there were few potential recycled water users within that service area.

CAL-AM and Coronado both provided survey responses that indicated an interest in pursuing development of a recycled water program within that service area. The Coronado indicated that there is approximately 150 million gallons (460 AF) used annually irrigating their 15 parks and golf course. In addition, the Navy also has potential uses in the area, including the golf course and a cooling tower at Naval Air Station (NAS), North Island. The Navy is currently evaluating the feasibility of constructing a wastewater scalping plant at NAS North Island to serve recycled water needs at the base. Coronado could consider partnering with the Navy on this project to also serve Coronado's recycled water needs.

3.2.3 Agencies Unlikely to Become Wholesale Customers

The following agencies provided survey responses that indicated that they were unlikely to purchase recycled water from the City as a wholesale customer:

- City of Del Mar
- City of Escondido
- Helix Water District
- Lakeside Water District
- Padre Dam Municipal Water District
- Sweetwater Authority

Each agency is described further below.

City of Del Mar

The City of Del Mar is currently purveying recycled water that is purchased from the San Elijo Water Reclamation Facility. The City of Del Mar's current agreement provides for purchase of 150 AFY which is then distributed to the Del Mar Fairgrounds. While there are three parks within the City of Del Mar, there are no other major users and, therefore, they do not have any plans to purchase additional recycled water or expand the distribution system.

City of Escondido

The City of Escondido produces and distributes reclaimed water and has indicated no interest in purchasing recycled water from the City.

Helix Water District

Helix Water District (Helix) does not currently have any recycled water facilities or customers. However, Helix prepared a recycled water report in 1991 and conducted an El Monte Valley Groundwater Recharge project feasibility study in 2006. Implementation of this project would require a source of advanced treated recycled water (microfiltration, reverse osmosis, ultraviolet light) for use in IPR. Sources of this water could be either the City or Padre Dam MWD, but would depend on the implementation of projects that would provide a high level of treatment from existing recycled water facilities.

Lakeside Water District

Lakeside Water District does not produce or distribute recycled water and does not have any plans for a recycled water system due to lack of local customer base and difficulty of pipeline installation

Padre Dam Municipal Water District

The Padre Dam Water Recycling Facility (Padre Dam) currently treats 2.0 mgd of the wastewater flows within their service area with the remaining flow sent to the Metro System for treatment at the PLWTP. Recycled water is served only in the Western Service Area. Padre Dam is in the midst of identifying new users within its service area and to determine financial feasibility to expand its existing 2.0 mgd plant to 4.0 mgd (Phase 1) to serve the increase in demand within its service area. Padre Dam is also coordinating with Helix Water District to potentially serve advanced treated water for the El Monte Valley Aquifer Recharge Project. If the El Monte Aquifer Recharge Project is fully developed as currently envisioned, an additional 4.5 mgd of demand would be realized. A future expansion (Phase 2) of the Padre Dam WRF to 10 mgd would be required to supply water for this project.

Sweetwater Authority

Sweetwater Authority does not produce or distribute recycled water. Sweetwater evaluated the use of recycled water in 2005. This evaluation/recycled water master plan was placed on hold after the anchor recycled water customer (a large power facility) had modified their planned project and its implementation schedule. This project was expected to provide primary financing for construction of recycled water distribution facilities and its delay has significantly affected the feasibility of the larger project. Currently Sweetwater Authority is not pursuing recycled water use due to lack of local recycled water demand, high cost of installing infrastructure and lack of financing.

4. SUMMARY AND CONCLUSIONS

Implementation of recycled water projects can be complex because it involves the identification of willing customers, significant facilities planning, securing financing for construction, and implementation of an operations and maintenance program. When other jurisdictions are included in planning for future projects, it adds additional complexity by adding the need to develop interagency service agreements, cost and financing planning, and liaison with other governing bodies and their decision making processes.

This survey of potential inclusion of wholesale customers within the PAs was designed to identify the level of recycled water planning that is occurring within each jurisdiction by various water purveyors. Three existing wholesale customers (City of Poway, OMWD, and OWD) and two potential additional wholesale customers (SFID and CAL-AM (Coronado)) were identified from the survey responses. Table 4-1 summarizes the current contracted and potential future demands that could be requested of the City's recycled water system. In addition, the combined delivered volume is also included for reference.

Table 4-1
Summary of Current and Potential Demand from Regional Agencies

Wholesale Customer	Source	Contracted AFY	FY2035 Potential AFY
Existing Wholesale Customers			
City of Poway	NCWRP	750 AFY	1,200 AFY (if requested)
Olivenhain Water District	NCWRP	400 AFY	1,000 AFY
Otay Water District	SBWRP	6,720 AFY	9,000 AFY
Existing Customer Totals		**7,870 AFY**	**11,200 AFY**
Potential Wholesale Customers			
CAL-AM (Coronado)	Not determined	0 AFY	460 AFY (with Navy could be approx 920 AFY)
SFID	NCWRP	0 AFY	150 AFY
Potential Customer Totals		**0 AFY**	**610-1,070 AFY**
Combined Totals		**7,870 AFY**	**11,810-12,270 AFY**
Actual Quantity Delivered in FY 2009		**4,066 AFY**	

Generally, the current demand is well below the contracted volumes for each of the wholesale customers. This could be a function of the number of customers currently online, the availability of recycled water from other sources, or other programmatic issues. It could be expected that a continuation of the drought would bring more customers which could in turn increase the amount sold to these water agencies. Regardless, these values are planning numbers for the purpose of identification of the potential of the sale of recycled water by the City to users outside the City's service area.

Realization of the demands identified as potential for the 2035 planning horizon are reliant on development of additional interagency agreements, development of specific projects, and determination of the feasibility of extension of the City's system to various points of connection consistent with the needs of the regional agencies, such as a northern connection for the City of Poway. Further review of the potential of these additional demands will be made as a part of the work done to strategize methods to maximize recycling.