

CHAPTER 6

WATER RECYCLING

This chapter describes the Union Sanitary District's wastewater system (which serves the ACWD's service area), and the opportunities for the use of recycled water in the ACWD service area.

6.1 AGENCY COORDINATION

As described below, Union Sanitary District (USD) provides wastewater transport, treatment and effluent disposal for the Cities of Fremont, Newark and Union City (encompassing the ACWD service area). ACWD has coordinated with USD in the development of a recycled water master plan (1993) which served as the basis for ACWD's recommended recycled water use plans, as outlined in the District's Integrated Resources Plan. Since 1993, ACWD and USD have jointly updated the master plan, most recently in 2003 with a feasibility study of a satellite recycled water treatment facility in southern Fremont.

6.2 WASTEWATER SYSTEM DESCRIPTION

The following provides a description of USD's facilities and operations, as previously summarized in USD's District-Wide Master Plan.

Wastewater Transport

Wastewater generated within the USD service area is collected and conveyed by gravity sewers to three major pump stations. The Irvington Pump Station serves the southern portion of the service area, the Newark Pump Station serves the central portion and the Alvarado Pump Station serves the northern portion. Wastewater collected in the southern and central areas is transported to the Alvarado Wastewater Treatment Plant (Alvarado WWTP) in Union City via dual 33-inch and 39-inch force mains. The northern drainage area wastewater is pumped directly to the WWTP headworks from the Alvarado Pump Station.

Wastewater Treatment

The Alvarado WWTP uses activated sludge as the biological liquid treatment process to meet the National Pollutant Discharge Elimination System (NPDES) permit requirements for secondary treatment. Additional treatment processes include primary and secondary clarification, and chlorination. The capacity of the WWTP is 33 mgd.

Solids handling at the WWTP includes: sludge thickening, digestion and dewatering. Sludge thickening is accomplished by gravity thickeners that are equipped with odor scrubbers. After thickening, the sludge is stabilized by anaerobic digestion and dewatered to about 20 percent solids using belt filter presses. Dewatered sludge is then transported by truck to approved agricultural fields in Sacramento County, (also Solano and Alameda Counties) where biosolids are surface applied and incorporated into the soil.

Effluent Disposal

All wastewater generated within the USD service area, including peak wet weather flows, receives full secondary treatment and is discharged to the East Bay Dischargers Authority's (EBDA) system for disposal in San Francisco Bay. Currently, there are no wet weather bypasses or overflows from the District's facilities. The EBDA system conveys treated effluent for discharge to the Bay from several local agencies. The facilities consist of approximately 58,000 feet of pipeline ranging in diameter from 60 inches, where USD discharges into the system, to 96 inches at the outfall. USD's contractual discharge capacity is about 43 mgd.

A portion of the USD's effluent is diverted from the EBDA pipeline to supply fresh water to the Hayward Marsh, a constructed wetland located just north of the San Mateo Bridge. In 1991, USD assumed responsibility for the Hayward Marsh Project. Located just north of the San Mateo Bridge, the marsh consists of 145 acres of fresh and brackish wetland, with wide-ranging environmental benefits. Before the marsh was restored from abandoned salt ponds, there was no wildlife habitat at the site. Now the marsh is a popular stop for migratory waterfowl and includes a preserve for the endangered Salt Marsh Harvest Mouse. High quality treated effluent supplied by USD is the fresh water source for this marsh ecosystem.

Existing and Projected Dry Weather Flows

The current average dry weather flows treated at the Alvarado WWTP is approximately 29 mgd. As part of its 1993 District-Wide Master Plan, USD developed dry weather flow projections of 31.8 mgd, 33.1mgd, 34.3 mgd and 35.6 mgd for the years 2010, 2015, 2020 and 2025, respectively. These dry weather flow projections were based on a review of existing and planned growth in the service area (based on the cities' General Plans) and were used for the sizing and phasing of future planned wastewater conveyance and treatment facilities.

6.3 CURRENT USES OF RECYCLED WATER

As described above, as part of USD's effluent disposal program, a portion of USD's effluent is provided to the Hayward Marsh Project (located within the ACWD service area) as a fresh water source for the marsh ecosystem. Approximately 3.5 mgd (approximately 3,900 AF/Yr) of high quality, treated effluent are provided to the marsh annually from USD's Alvarado WWTP. However, currently there are no uses of recycled water in the ACWD service area that are off-setting potable water demands. ACWD's water supply strategy, documented in the District's 2001-2005 Urban Water Management Plan and Integrated Resources Plan (IRP), includes plans for a recycled water project in the service area by the year 2020. As described in the IRP, a brackish groundwater desalination facility was implemented prior to a recycled water project because the desalination project was determined to be more cost-effective while also providing a high-quality potable source of supply (as opposed to a non-potable recycled water supply).

6.4 FUTURE RECYCLED WATER OPPORTUNITIES

The use of recycled water to offset the distribution system demand is included as part of ACWD's long-term water supply strategy in the District's Integrated Resources Plan. Recycled water in the service area is planned solely for non-potable use, primarily for landscape irrigation and industrial use. The District is not considering the use of recycled water as a potable water supply. ACWD's IRP strategy includes a phased approach to developing a recycled water supply with the first phase providing up to 1,600 AF/Yr by the year 2020. A potential second phase providing up to an additional 1,000 AF/Yr is also considered in the District's IRP (see Chapter 8 for ACWD's planned use of recycled water in 5-year increments).

ACWD and USD have evaluated several opportunities for recycled water use as a non-potable water supply in the service area. Potential sources of recycled water include treated wastewater from either the USD Alvarado Wastewater Treatment Plant or from a satellite treatment facility located in the southern service area. Each of these opportunities is described in greater detail below.

Recycled Water Treatment at USD's Alavarado Waste Water Treatment Plant

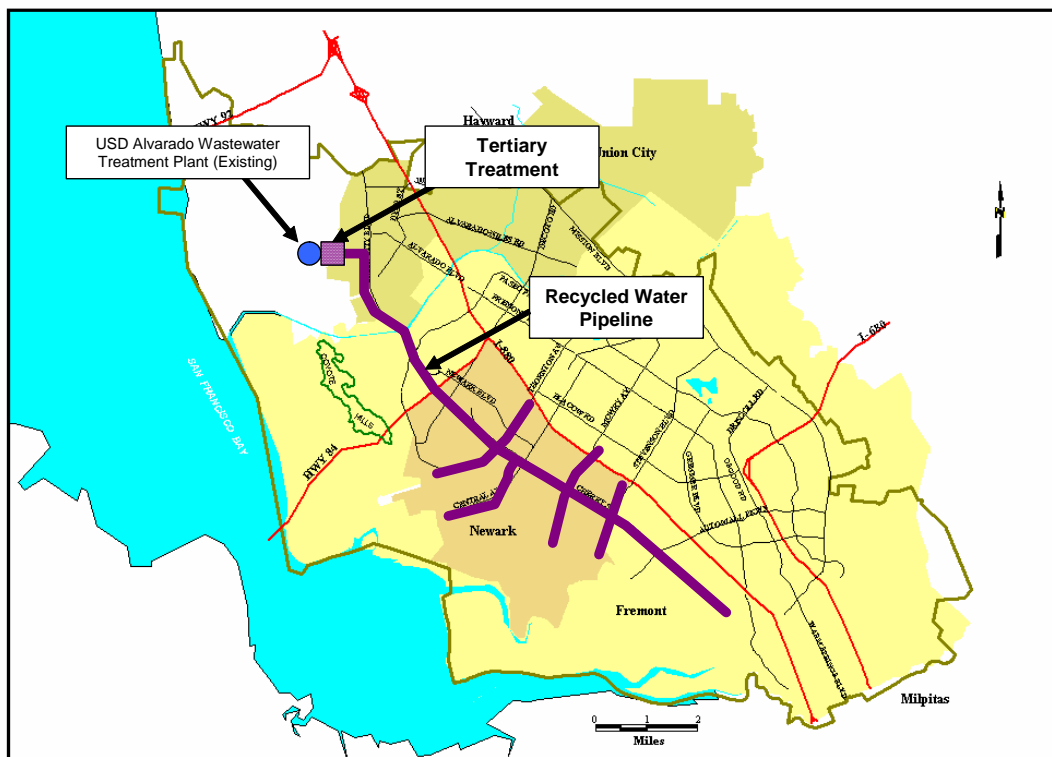
In 1993 ACWD and USD completed a Nonpotable Recycled Water Master Plan (1993 Master Plan) for the development of a recycled water program within the ACWD/USD service area. The 1993 Master Plan identified a total non-potable recycled water demand (primarily for landscape irrigation purposes) of approximately 4,000 AF/Yr. The recycled water source would be from a new tertiary treatment facility at USD's existing Alvarado WWTP in Union City. The 1993 Master Plan recommended a three phase implementation plan which allows for the most cost-effective users (i.e. those in the northern service and

central service areas, known as the Phase 1 and Phase 2 service areas, respectively) to be connected to the system first.

Since 1993, a number of changes have occurred which prompted a Recycled Water Master Plan Update in 1999, including potential new demands and new regulatory requirements. The 1999 Master Plan Update identified potential demands in the Phase 1 and 2 service areas of 2.4 mgd or approximately 2,700 AF/Yr. Because of the large landscape irrigation component, the demand peaks during the summer irrigation season and is minimal during the winter. The maximum day demand during the summer is projected to be 6.8 mgd compared to a typical winter demand of about 0.3 mgd.

The recycled water would originate at the Alvarado WWTP, located at the north end of the service area (Figure 6-1). For a system such as that proposed for ACWD and USD, the recycled water must be suitable for application on unrestricted use sites such as schoolyards, parks, playgrounds and food crops. This requires a high level of treatment that Title 22 designates as “disinfected tertiary recycled water.” Following secondary treatment of the wastewater, this treatment level requires chemical addition, flocculation/coagulation, filtration and disinfection.

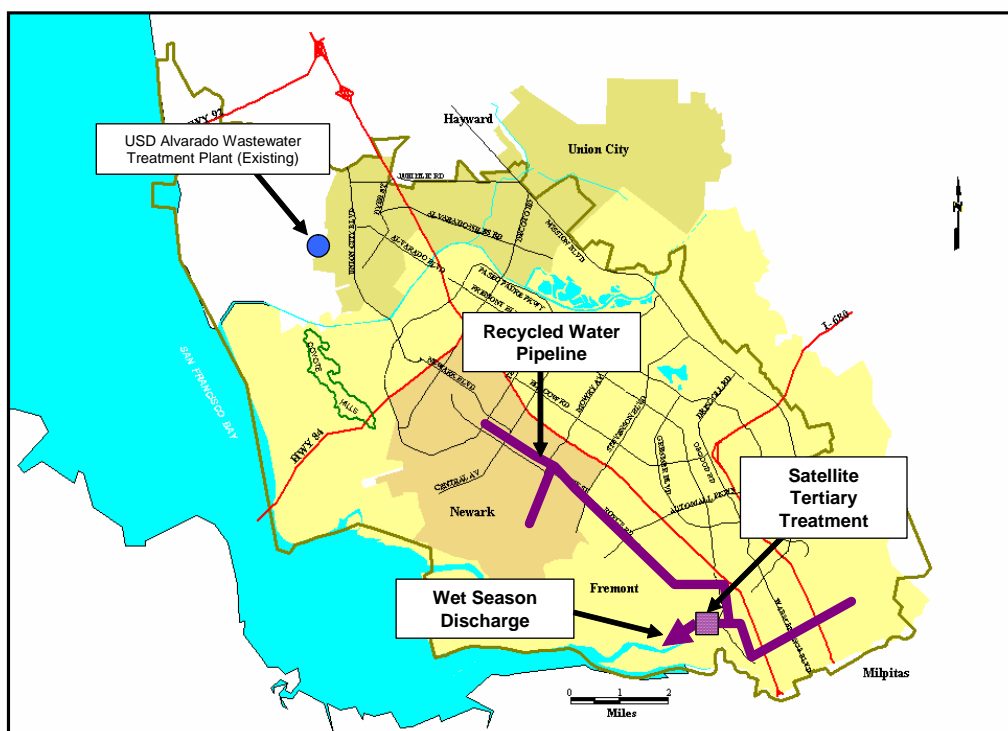
Figure 6-1
1993 & 1999 Recycled Water Master Plan - Proposed Recycled Water Facilities



Recycled Water Treatment at a Satellite Treatment Facility

As an alternative to constructing a recycled water treatment facility at the Alvarado WWTP, in 2003 ACWD and USD completed an evaluation of the feasibility of constructing a satellite recycled water treatment facility in southern Fremont at USD's Irvington Pump Station (Figure 6-2). This satellite facility would benefit ACWD by providing a recycled water source for customers in southern and central Fremont, and would benefit USD by providing advanced treatment for a potential new wet-season outfall, thereby addressing some of the wet-weather disposal issues facing USD. This feasibility study identified a potential future recycled water demand of approximately 1,600 AF/Yr in ACWD's southern service area. However, much of this projected demand is for two planned golf courses, which have not yet been constructed. Therefore, prior to moving forward with this project, primary customers' (i.e. golf courses) demands must be in place.

Figure 6-2
2003 Recycled Water Satellite Treatment Feasibility Study - Proposed Recycled Water Facilities



6.5 OPTIMIZATION OF RECYCLED WATER SUPPLIES

As described above, ACWD has plans to develop a recycled water project with USD to provide up to 1,600 AF/Yr of recycled water supply by the year 2020. Because the planned implementation of a recycled water project in the ACWD service area is still at least ten years away, ACWD has not developed a detailed recycled water optimization plan. Future updates to this Urban Water Management Plan will include the documentation of an optimization plan as the recycled water project planning continues. However, potential actions that may be taken by ACWD and USD to encourage customers to accept the use of recycled water include the following:

- Financial Incentives: This would provide an incentive by offering customers a lower rate for recycled water than for potable supplies from the distribution system. Other financial incentives may include reduced connection charges and service charges.
- Guarantee of Firm Supply: This would provide an incentive for recycled water use by guaranteeing that the recycled water supplies would not be subject to voluntary or mandatory cutbacks during droughts and/or water supply shortages.
- Requirements for New Developments: As a condition for ACWD service, the District may require that developers install separate distribution systems for the use of recycled water for landscape irrigation purposes. Requirements may also be put in place for these new developments to accept the recycled water for landscape irrigation in-lieu of potable water.

The actions described above have not been formally adopted by ACWD or USD but represent potential actions that may be taken in the future as recycled water becomes available. In addition, projections of the quantities of recycled water that may be utilized as a result of these potential actions have not yet been developed. As with the recycled water optimization plan discussed above, these projections will be developed as recycled water planning in the service area progresses and will be included in future updates to this Urban Water Management Plan. However, based on discussion with many of the potential recycled water customers, including city parks, schools, planned golf courses and industrial parks, there is a high degree of acceptance for the use of recycled water in the service area, and no significant obstacles to the full utilization of the planned recycled water quantities is anticipated.