

# **What Do Customers Really Want?**

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## **Abstract**

This presentation will discuss how Tucson Water has created a successful partnership with its over 600 reclaimed water customers and the community. During the 19 years that Tucson Water has operated a reclaimed water system, the utility has identified five things customers expect:

- Assurance of safety
- Reliable service
- Financial savings
- Opportunity to be part of the community's water conservation ethic
- Convenient sign-up process

This paper includes information about water quality monitoring program, site inspections, cross-connection testing, signage and pressure policies, and customer and community education programs.

The Tucson Water reclaimed water system has more than 100 miles of pipeline and 15 million gallons of storage. Summer peak day delivery is 23 million gallons.

## **Tucson, A Water Conscious Community**

Tucson, located in the Sonoran Desert, receives only 11 inches of rain a year and has no perennial surface water supply. As a result, Tucson has always been a water-conscious community. The Tucson area is growing rapidly, at a rate of 2.5 to 3 percent annually. Today Tucson Water is delivering its customers groundwater and Colorado River water that has been recharged and recovered for potable uses and reclaimed water for turf and landscape irrigation.

Tucson's reclaimed water system is unique because it was not developed as a method of disposing of treated wastewater, but rather to utilize this water as a new supply. Wastewater is the only supply available to Tucson that will continue to grow as the population increases. Therefore, reclaimed water will play an increasingly important role in the water supply picture. The City has committed to increasing the use of effluent as part of its long-range water supply plan.

## **A Regional Overview**

The City owns and operates a municipal water utility, Tucson Water, which provides potable and reclaimed water service in the Tucson metropolitan area. Tucson Water serves potable water to over 650,000 people, about 80 percent of the metropolitan population. In 2000, the utility pumped 117,400 acre-feet of groundwater. The combined annual municipal, agricultural, and mining pumpage of the region is nearly two and a half times more water than is being replenished to the aquifer.

Pima County owns and operates the regional wastewater collection system and treatment facilities. An intergovernmental agreement between the City and the County provides the City with the right to use about 50 per cent of the effluent produced at the two regional treatment plants. Today, approximately 11,000 ac-ft/yr (about eight percent of Tucson Water's total water demand) is used in the reclaimed system and the remainder is used to irrigate two golf courses or is discharged into the Santa Cruz River, under an NPDES Permit, where it recharges the aquifer. The City has committed to the increasing use of effluent as part of its long-range water resources plan and Assured Water Supply Designation. It is projected that effluent reuse will continue to be eight (8) percent of the total water demand through the year 2050.

### **Tucson's Reclaimed Water System**

Since the first customer (a golf course located at the end of a ten-mile pipeline) received reclaimed water, 90 more miles of pipe have been added to the system. There are now 15 million gallons of storage available in five reservoirs. In addition, about half of the total annual production capacity comes from recharge and recovery facilities operated in concert with the filtration plant.

The Sweetwater Recharge and Recovery Facility is located south of the filtration plant. It consists of eight constructed basins which are used to recharge secondary effluent produced at Pima County's wastewater treatment plant. A constructed wetlands is also part of the Sweetwater facility. The wetlands were designed to treat the backwash water from the filters and is also used as a public environmental amenity. The Sweetwater facility is operated under an aquifer protection permit that allows 6,500 acre-feet/year of treated wastewater to be recharged and recovered annually.

The Santa Cruz Managed In-channel Recharge and Recovery Facility is a reach of the Santa Cruz River that will soon be permitted by the Arizona Department of Water Resources to be used as a recharge facility. Secondary effluent treated at Pima County's wastewater treatment plant that is not subjected to further treatment for the reclaimed water system is discharged into the Santa Cruz River where it recharges the aquifer.

This recharged water will be recovered through wells. The City will be able to recharge and recover approximately 8,500 acre-feet/year from this facility.

Recovered water from the Sweetwater and Santa Cruz facilities is blended with water produced at the filtration plant to produce water that meets Tucson's Reuse Permit requirements. The recovered water is a very good quality, less than one NTU turbidity with nitrogen levels below or slightly above the 10mg/L drinking water standard. This low nitrogen level is significant because the secondary effluent produced by Pima County is not denitrified and typically is in the 20 - 30 mg/L range.

The amount of recovered water blended with the filtered water varies daily based on total system demand and the quality of the filtered water. On an annual basis, the blend is about 56 percent filtered water and 44 percent recovered water.

### **Customer Characteristics**

During 2000, almost 10,000 acre-feet of reclaimed water was delivered to over 260 customers. Sixty-five percent of this water was delivered to twelve golf courses. Another 20 percent was delivered to parks. The remainder was delivered to schools (6.8 percent), single family (1.7 percent), agriculture (2.6 percent), commercial (1.2 percent), multi-family (0.6 percent), and street landscape (1.2 percent). Although reclaimed water deliveries have increased 50 percent since 1995, the percentage of deliveries in each customer category has remained constant except in the single-family group which has increased significantly. This can be attributed to increased public awareness of the availability of reclaimed water and the City's goal to develop a model environmental community which includes reclaimed water service to each home.

All of the City-owned golf courses are irrigated with reclaimed water or secondary effluent. The City has a policy that all new golf courses and turf facilities over ten acres use reclaimed water. Pima County also has a policy requiring reclaimed water use.

### **What Do Customers Really Want?**

During the 19 years Tucson Water has operated its reclaimed water system, the utility has learned that there are five things customer expect: assurance of safety; reliable service; financial savings; opportunity to be part of the community's water conservation ethic; and a convenient sign-up process.

### ***Assurance of Safety***

Customer confidence that the reclaimed water is safe for the purposes it is used is of paramount importance to the success and growth of the reclaimed water system. Tucson Water assures that the water always meets or is better than the State regulatory standards by monitoring water quality more often and at more locations than is required by the Reuse Permit.

The utility inspects every site for potential cross connections prior to initiating reclaimed water service. A program is being developed to regularly inspect every reclaimed water site for cross connections and compliance with State Reuse Regulations.

### ***Reliable Service***

Reclaimed Water customers, particularly golf courses, expect a high level of reliability. Tucson Water addresses system reliability in these ways:

- a plan to have the entire system looped with so water can be routed to a location several different ways
- 15 million gallons of reservoir storage in the system and a goal of having system storage equal the peak day
- potable water backup at each of the five reservoirs

All new golf courses are required to have onsite storage equal to at least their peak day demand.

### ***Financial Savings***

Since the reclaimed water system began delivering water in 1984, it was been the policy of the Tucson Mayor and Council that reclaimed water cost less than potable water. Since the City does not require the use of reclaimed water, except for new golf courses, price is the primary incentive for customers to convert to reclaimed water.

Over the years, the reclaimed water rates have recovered approximately 80 per cent of the cost of service. The 20 per cent that is not covered by the reclaimed water rate is recovered in the potable water rate. The community has accepted this “subsidy” because the use of reclaimed water benefits everyone by preserving groundwater and Colorado River water for drinking.

Individual customer savings vary based on usage patterns. The potable rates are an inverted block structure with a summer surcharge and rate penalties for the highest usage blocks. For example, a golf course would save a significant amount by using reclaimed water instead of potable water delivered by Tucson Water.

### ***Opportunity to be Part of the Community’s Water Conservation Ethic***

Tucson is a water conscious community. The most common complaint the utility gets about the reclaimed water system is that service isn’t available to enough customers. Tucsonans want to conserve water and they understand that using reclaimed water for irrigation is an important way to conserve.

### ***Convenient Sign-up Process***

Customers are busy people. Tucson Water tries to make signing up for reclaimed water service as easy as possible. While the utility does require some of the paperwork to be submitted in person, the forms are downloadable at Tucson Water's website, [www.cityoftucson.org/water](http://www.cityoftucson.org/water).

### **Conclusion**

Satisfied customers are the basis of the success of the reclaimed water system. Tucson Water has been able to operate and continually expand its reclaimed water system by listening to and responding to the customers' needs.