

Sunnyvale's Water Management System Gets Efficiency Boost from Aquacue Technology

“Aquacue’s technology has delivered 21st century solutions to longtime infrastructure, operational and customer service challenges. We couldn’t be in better shape moving forward with regards to understanding and effectively managing water usage citywide and across all customer groups.”

-- Tim Kirby, Revenue Systems Supervisor,
City of Sunnyvale

Executive Summary



City of Sunnyvale

Population: 140,000

Water meters: > 29,200
(res/comm)

Program Goals

Optimize park water use/infrastructure efficiency • Detect leaks • Provide usage data/analytics to inform operational plans • Decrease operational expenses • Provide consumption info to commercial customers

Constraints

Limited funding • Use existing infrastructure • Work with existing AMR system • Flexible and scalable for phased rollout

Aquacue Products and Services Supplied

- Aquacue Barnacle™
- Aquacue Wave™ Analytics & Visualization Software

Results

5% annual water use reduction or 23M gallons saved due to early leak detection



Background

The city of Sunnyvale (pop.140,000) is located in Silicon Valley, CA and is home to some of the nation's most successful business and industrial leaders. Sunnyvale is also recognized for its high standard of living and plethora of public amenities, including many high quality parks and recreation areas, a full-service library, diverse cultural and entertainment centers, and excellent public schools. The city of Sunnyvale also demonstrates a strong commitment to the maintenance of its many public facilities and services.

To satisfy the needs of its residents and businesses, the city owns, operates, and maintains a water supply and distribution system, including: over 280 miles of 6-inch to 14-inch diameter water main pipelines, approximately 30,000 residential water meters, 3,380 fire hydrants, 250 city-owned backflow devices, and an automated supervisory control and data acquisition (SCADA) system that controls the distribution of water throughout the city.

In 2010 the city consumed 21,465 acre-feet of water, of which 43% was supplied by the Santa Clara Valley Water District, 42% by the San Francisco Public Utilities Commission (mostly from the Hetch Hetchy Reservoir), and 15% supplied by local wells and recycled water. The city's largest water consumers are residential customers, accounting for approximately 75% of total consumption. Commercial customers use 20% and irrigation accounts for less than 5% of consumption. The total cost of water supply for the city of Sunnyvale in 2010 was approximately \$14.3 M. The average cost of one acre-foot was \$665, however the cost varied by sources of supply. Local wells and San Francisco Water Supply were the most expensive sources, with the cost of \$723 and \$719 per acre-foot, respectively. The cost of water supply from Santa Clara Valley Water District was \$620 per acre-foot, while the cost of recycled (non-potable) water was only \$459 per acre-foot.

The city also undertakes water conservation efforts through a system of water demand management measures.

For instance, together with the Santa Clara Valley Water District, Sunnyvale distributes

high-quality low-flow showerheads and faucet aerators to its residents free of charge. Sunnyvale continuously implements water audits, leak detection and repair for the water distribution system, and carries out public information campaigns aimed at water conservation.



Business Challenge

The city of Sunnyvale was experiencing multiple pressures to upgrade its water management system. Firstly, water supply cost were projected to rise dramatically

over the coming years. As Sunnyvale purchases water for its own use (administrative infrastructure, parks and public schools), such rate increases would negatively impact the city budget and its commercial and residential water users. The cost of water purchased from SFPUC is estimated to increase from \$719 in 2010 to \$1921 in 2020 (more than 10% average annual increase), while the cost of SCVWD's water will increase from \$620 to \$1190 over the same period (about 6.7% average annual increase). Potential water shortages or supply disruptions also meant that any of these water vendors could impose strict quotas on water consumption across all customer segments. Secondly, the city's major commercial customers were increasingly requesting more detailed information on their water consumption that would offer insight into reducing operating costs and achieving sustainability goals. Finally, the city officials themselves were also concerned about the sustainability of Sunnyvale's water system operation and strived to minimize the negative environmental impact stemming from excessive water use.

Together, these issues prompted Sunnyvale to **adopt a water management solution that delivers actionable information on water consumption by all user segments, with the ultimate goal of reducing water consumption.**

Program Goals

The primary goals that the city of Sunnyvale planned to achieve by implementing a new water management solution include:

Optimize water use by city parks: Park managers need real-time water consumption information to meet usage quotas set by the city and to test irrigation systems for proper functioning.

Detect leaks at city-managed sites (administrative buildings, parks, public schools and commercial customer sites), including leak notification and leak-site identification.

Provide large commercial customers with detailed water usage information. Given that these customers already have both economic and sustainability-focused incentives to reduce water consumption, this information helps them achieve this goal.

Create plans for the operation and development of the city water infrastructure. The ability to easily access and analyze historic and current information on citywide water consumption – for individual residential users and commercial customers alike – is crucial for the planning process.

Decrease the time, effort and cost of maintaining and managing the metering infrastructure.

Constraints

Sunnyvale faced several constraints in implementing the water management solution. Firstly, the city had very limited funds for such an implementation, which effectively eliminated the possibility of installing traditional advanced metering infrastructure (AMI) systems. Secondly, the new system had to allow rapid deployment without making modifications to the existing infrastructure. Thirdly, the water management system had to be flexible and scalable to allow a phased rollout.

Sunnyvale wanted to begin by evaluating the system's performance through a series of pilots and then implement it in several stages depending on the site objectives and on the availability of funds. The city needed a solution that was as powerful, simple to use and cost-efficient. Finally, the new solution had to work seamlessly with the mobile AMR system already in place, and be able to integrate the historic data to provide the system-wide performance analysis.

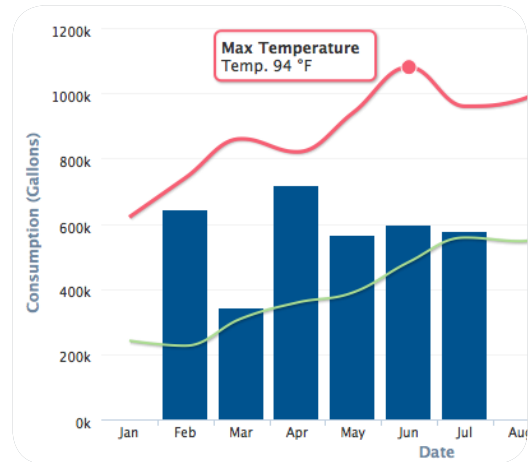


Solution

During the 12-month program, Aquacue provided Sunnyvale with Wave™, its web-based analytics software and Aquacue Barnacle™ meter-reading devices. Aquacue's products and services allows Sunnyvale city managers to analyze the entire city's water consumption online, including real-time data delivered through Barnacles, interval measurements from AMR and available historic data.

During the first project phase Aquacue Barnacles were installed on 10 existing meters.

Aquacue Wave provides the web-based analysis tools to make this information available to the city officials or selected commercial customers in real-time. This information can be used to optimize water consumption and inform the development of operational and strategic infrastructure plans. Aquacue’s technology also offers prompt leak alerts that help the city decrease the amount of water wasted due to leaks.



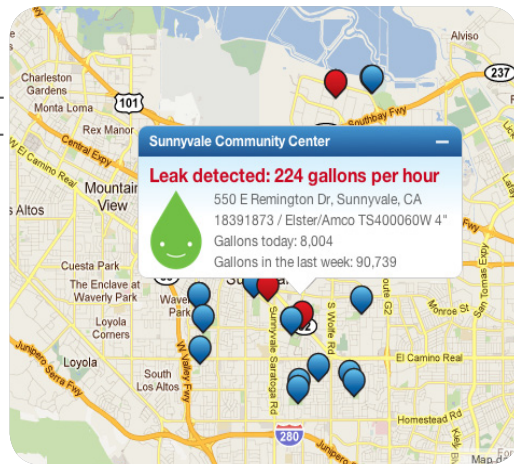
Results

Aquacue’s technology enabled the city of Sunnyvale to gain invaluable insight into city-wide water consumption. Park managers are now able to track water consumption on an hour-to-hour basis, optimize water use and calibrate irrigation systems. City workers can also detect leaks thus preventing excessive water use and avoiding potential property damage.

Several commercial customers now have access to hourly water usage information, which serves as a valuable tool to develop their resource conservation programs.

As of October 2011, 10 Barnacle-equipped meters account for 73M gallons (225 acre-feet) average annual water consumption, including 25M gallons of commercial customer consumption and 48M gallons of parks and irrigation consumption. Based on leaks identified to-date, the city can realize a 5% reduction in water use by these meters,

When the city of Sunnyvale completes the installation of Aquacue Barnacles on all city park meters in Q4 2011, it expects to save approximately 23M gallons of water annually.



Next Steps

The city of Sunnyvale continues to expand its use of Aquacue’s products and services into its water management system and operations to facilitate water conservation, achieve cost savings, improve planning, and deliver superior customer service.