



DISTRIBUTION SYSTEM WATER LOSS CONTROL SHARED SERVICES PROGRAM

Conserving water is a priority for all Orange County residents. It saves money, energy and helps preserve our environment. The Municipal Water District of Orange County (MWDOC) Leak Detection Program helped plug over a thousand hidden leaks throughout Orange County. MWDOC began offering leak detection services to OC water providers in 2019. To date, MWDOC partnered with 24 different OC water retailers to detect leaks on their water distribution mains, meter connections, and other fixtures. The acoustic leak detection equipment used by MWDOC technicians can locate leaks before they surface, shortening their runtime, avoiding costly public and private property damage, and saving hundreds of acre-feet (AF) of water per year.

A team of MWDOC leak detection technicians walk the streets and neighborhoods of Orange County daily, using acoustic leak detection equipment to listen to leaks at every customer connection. Through their headsets, the technicians can tell if a leak is present, its magnitude and relative location. This helps repair crews be more efficient and precise when making repairs, minimizing emergency work performed after hours and disruption to residents, businesses, and traffic.

The Distribution System Leak Detection Program is entering its 7th year of surveys, with more cities and water districts partnering each year. The program not only saves water, but it also saves water retailers and customers money. Additionally, the program helps OC agencies comply with upcoming water loss control regulations currently being developed by the State Water Resources Control Board without the need for additional staff.



Since 2019, MWDOC has partnered with twenty-four (24) Orange County retail water agencies to identify hidden leaks, allowing these agencies and their customers to make repairs before they could become much more catastrophic and costly. A total of 5,627 miles of water mains were surveyed across the agency’s service areas. Fixing the leaks found during these leak detection surveys saved a total of 7,135 acre-feet (AF) of water, or enough to supply 17,837 OC households with water for a year. In addition, repairing these leaks saved 7,075,795 kilowatt hours of electricity, reducing Carbon Dioxide emissions by approximately 3,569 metric tons. Below is a table of the number of leaks found, how much water was saved as a result, the amount of money saved because these hidden leaks were identified and repaired, and the energy savings. In 2024 alone, MWDOC’s Leak Detection Program saved these water providers a combined total of \$192,250, which will result in a lifetime savings of over \$1,000,000.



Surfacing Leaks vs Hidden Leaks

Traditionally, water providers have only discovered and repaired leaks after they have surfaced, often when they are called in by a member of the public. This practice of waiting until a leak surfaces can cause additional roadway and property damage. Allowing the leak to run for longer increases the amount of water lost.

MWDOC's pro-active leak detection program helps water retailers find leaks sooner so that they can be repaired before causing damage to surrounding infrastructure, minimizing the impact to the community and lessening the amount of water lost.



A program developed out of necessity...

Water utilities throughout California are facing increasingly complex/stringent regulatory challenges, many focused on preparing for climate change and associated impacts to water supply reliability. Assembly Bill 1440 and Senate Bill 555 raised the bar by mandating all urban water suppliers to reduce distribution system water loss.

MWDOC developed a unique Water Loss Control Technical Assistance and Shared Services Program to ensure water suppliers throughout Orange County exceed compliance with distribution system water loss regulations. The program offers direct one-on-one access to a staff specialized in water loss control and capable of performing distribution system leak detection, pressure surveys and water meter accuracy testing on behalf of retail water suppliers.

Initially, MWDOC provided training to OC water suppliers to use amplified acoustic listening equipment to find hidden leaks in their distribution pipelines along with providing an equipment lending library. More than 50 water utility staff were trained to use the equipment. After implementing this program for approximately a year, water suppliers asked MWDOC to hire staff to perform leak detection services on their behalf. The problem - intermittent use of the highly specialized acoustic equipment did not allow staff to “develop an ear for the sound of a leak.” The solution - MWDOC staff uses the equipment every day and has become a highly effective and specialized resource our agencies can rely on to find hidden leaks.

MWDOC Water Loss Control Programs are a sustainable shared service accessible to all water suppliers throughout Orange County.

INNOVATION ELEMENTS: Acoustic leak detection is a non-invasive, eco-friendly, and accurate approach to locating hidden water leaks and reducing water loss. It uses sensitive microphones and advanced algorithms to listen for the distinctive sounds of escaping water, accurately pinpointing leak locations. This technology is particularly effective in complex and hard-to-access areas, like underground pipes, and can identify even the smallest leaks that traditional methods often miss.

COMPREHENSIVE APPROACH TO SUSTAINABILITY: MWDOC's formal water loss control program helps reduce unnecessary water withdrawals, minimizes environmental impacts from those withdrawals, and decreases pumping and treatment costs—all of which contribute to both environmental sustainability and energy efficiency.

MWDOC complements its main leak detection program with additional initiatives like the Pressure Regulation & Leak Detection Program, which helps moderate high-water pressure in residential settings. This program installs or adjusts Pressure Regulating Valves (PRVs) that optimize home water pressure while significantly reducing the likelihood of leaks developing.

MWDOC also promotes Flow Monitor Devices that allow residents to monitor their water use 24/7 and receive instant leak alerts through smartphones or tablets, encouraging proactive leak prevention at the consumer level.

The Program continues to grow; currently evaluating a new production water meter testing program to replace the sunseting Southern California Edison Pump Efficiency Program.

MWDOC's water loss control and leak detection programs represent a holistic approach to environmental sustainability and energy efficiency. By preventing water waste, reducing energy consumption associated with water treatment and distribution, and generating economic savings, these programs effectively contribute to climate change mitigation while conserving one of California's most precious resources. The programs demonstrate how technological innovation, when combined with systematic implementation, can yield significant environmental benefits at both local and regional levels.

MWDOC's leak detection program directly contributes to energy efficiency because water leaks significantly increase energy consumption. The processes of supplying, treating, and distributing water require substantial energy, and when leaks occur, more water must be pumped and treated to compensate for these losses, resulting in higher energy demands. When less energy is consumed for water management, greenhouse gas emissions are reduced accordingly.

By identifying and repairing leaks early through their detection program, MWDOC helps water utility providers reduce costs associated with water loss and infrastructure damage while avoiding regulatory fines related to water wastage and environmental violations. This proactive approach enhances operational efficiency and resource allocation.




Leaks are found on both the utility side of the water meter and the customer side of the meter so both are beneficiaries of this collaborative program.



The Program generated significant awareness and **helped preserve trust in local government**. Social media posts featuring the MWDOC's Water Loss Control Programs reached 33,985 individuals on Instagram, Facebook, and LinkedIn. In addition, presentations have been requested across the state, country, and internationally. MWDOC's Water Loss Control Program has been featured at 12 conferences and webinars including those sponsored by AWWA, CalWEP, DWR. Conference titles: North American Water Loss Conference, AWWA ACE, AWWA Annual Fall Conference, and Water Smart Innovations. The program has been presented to 16 individual water retailers looking to replicate its success.

The Program's Tangible Water Saving Benefits

LEAK DETECTION By the Numbers

 FISCAL YEAR	 MILES SURVEYED	 LEAK COUNT	 WATER SAVINGS (AF/YR)	 COST SAVINGS	 ENERGY SAVINGS (KWH)
FY 19-20	571	326	186.4	\$121,791	1,541,739
FY 20-21	601	267	86.3	\$72,797	1,152,341
FY 21-22	1,176	438	150.4	\$141,388	678,418
FY 22-23	1,294	816	164.3	\$157,327	1,341,025
FY 23-24	1,327	634	157.5	\$116,631	1,761,529
FY 24-25*	658	350	68	\$61,119	600,743
<i>*year currently in progress</i>	5,627	2,831	812.9	\$671,053	7,075,795

City of Anaheim
 City of Brea
 City of Buena Park
 City of Fountain Valley
 City of Fullerton
 City of Garden Grove
 City of Huntington Beach
 City of La Habra
 City of La Palma
 City of Newport Beach
 City of Orange
 City of Santa Ana
 City of Seal Beach
 City of Tustin
 City of Westminster

East Orange County Water District
 El Toro Water District
 Emerald Bay Service District
 Golden State Water Company
 Irvine Ranch Water District
 Laguna Beach County Water District
 Mesa Water District
 Moulton Niguel Water District
 Santa Margarita Water District
 Serrano Water District
 South Coast Water District
 Trabuco Canyon Water District
 Yorba Linda Water District

Program Participation & Partnership

Metropolitan Water District of Southern California



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