



[Operation NEXT: LA's Next Major Water Source](#)

Sustainability and resiliency drive the need for developing a local water supply

By Carol Tucker

With purchased imported water becoming increasingly unreliable and costly and anticipated extended dry periods, the need for a local sustainable water supply has never been greater. LADWP has continually worked to expand local water resources through four key strategies: stormwater capture, groundwater remediation and replenishment, water conservation, and recycled water for irrigation, industrial, and environmental uses.

Now LADWP has embarked on a visionary and transformational initiative to further improve the overall water supply resiliency and reliability for Los Angeles. The initiative, dubbed [Operation NEXT](#), will help achieve L.A.'s local water supply goal of recycling 100 percent of available purified wastewater from the Hyperion Water Reclamation Plant by 2035, creating a sustainable new water source for Los Angeles.

"Looking to the future, LADWP and the City of Los Angeles are focused on becoming Water Strong - building resilient, sustainable local water supplies," said Rich Harasick, Senior Assistant General Manager, Water System. "Beginning with William Mulholland's vision of the L.A. Aqueduct, the Department has had the foresight to understand our city's growing need for water, and invested heavily in water infrastructure."

"Operation NEXT is our generation's vision for ensuring a sustainable and resilient water supply for future generations" - Rich Harasick, Senior Assistant General Manager, LADWP Water

A partnership with [Los Angeles Sanitation and Environment \(LASAN\)](#), Operation NEXT and LASAN's Hyperion 2035 programs will maximize production of purified recycled water from the [Hyperion Water Reclamation Plant](#) to replenish the city's groundwater basins for future use and to augment LADWP's own supplies at the Los Angeles Aqueduct Filtration Plant. LADWP is working with regulators to potentially allow integrating purified recycled water with the drinking water supply by blending it with imported water sources. The process, known as direct potable reuse (DPR), would further expand the use of purified recycled water from Hyperion and other city water reclamation plants as a supplemental

local water source.



Hyperion Water Reclamation Plant, operated by L.A. Sanitation, will be retrofitted with advanced treatment facilities for producing purified recycled water. (Photo courtesy of the Mayor's Office)

Located in Playa Del Rey, the Hyperion plant is one of the largest water reclamation plants in the nation, treating an average daily flow of 260 million gallons per day (MGD) to full secondary standards. Approximately 27 percent of this water is currently being recycled for in-plant, irrigation, industrial and other non-potable uses in the L.A. area. Under the Operation NEXT and Hyperion 2035 programs, LASAN will retrofit Hyperion's existing conventional treatment process with advanced treatment processes (membrane bioreactors or equivalent, reverse osmosis, and advanced oxidation), to produce up to 174 MGD of purified recycled water. That represents enough water to sustain 780,000 Los Angeles homes.

It will be LADWP's job to transport that purified recycled water to replenish groundwater aquifers in the West Coast, Central and San Fernando Basins that have been drawn down due to more hardscape and increased pumping to meet growing demands. A portion of this new water supply will eventually be pumped inland to the Los Angeles Aqueduct Filtration Plant for additional treatment and integration with the drinking water system, said Rafael Villegas, Operation NEXT Program Manager in LADWP's Water Resources Division.

"We are essentially creating a new local water source, offsetting the need for importing purchased water supplies from hundreds of miles away, and also reusing this valuable resource that would

otherwise go into the ocean,” Villegas said.

Water for a Thirsty City



The L.A. Aqueduct first opened in 1913, bringing water to a thirsty city from the Eastern Sierra. (Photo by Art Mochizuki)

Historically, LADWP has relied on three main sources of water: the Los Angeles Aqueduct System, local

groundwater, and supplemental water purchased from the Metropolitan Water District of Southern California (MWD). MWD water is delivered via the Colorado River Aqueduct and the State Water Project, which conveys water from the Sacramento-San Joaquin Delta south to Southern California through the California Aqueduct.

Providing water for Los Angeles has never been easy. The city's growing population depleted its original water source—the Los Angeles River—early in its history. William Mulholland, the first Chief Engineer of the city's Municipal Water Department, built the Los Angeles Aqueduct to convey water from the pristine Eastern Sierra mountains through the Owens Valley to Los Angeles, flowing by gravity only.

After the first Los Angeles Aqueduct, LADWP built the extension to Mono Basin and then formed a regional consortium that became MWD, which developed the Colorado River Aqueduct in 1935. In the 1970s, LADWP built the second L.A. Aqueduct to expand the water supply from the Owens Valley.

During the dry periods of the late 1980s through mid-1990s, LADWP began relying more on imported water purchased from MWD. That trend has continued due to dry periods and legal commitments for environmental stewardship on L.A. Aqueduct water from the Eastern Sierra.

Over the last 20 years, LADWP has purchased water supply from MWD ranging from up to 75 percent at the peak of a recent multi-year dry period. Imported supplies continue to be less predictable due to hydrologic variability and continued impacts of climate change. Operation NEXT will help provide a new reliable local water supply to serve the city's growing population and water needs.

Constraints on Our Water Supply

Today, the city only receives about half of its historic water supply from the LA Aqueduct while the remainder stays in the Owens Valley and Mono Basin to meet environmental commitments. Meanwhile, MWD's water sources are also facing challenges. The Sacramento-San Joaquin Delta faces environmental restrictions on water conveyance related to a declining fish species, and increasing regulatory requirements to protect the remaining populations, according to the California Department of Water Resources. The Colorado River has also been impacted by climate change and uncertainty around future allocations. Additional external challenges to L.A.'s imported water sources include seismic risk, variable hydrology, and rising costs.

In terms of the city's local water supply, the quality of L.A.'s groundwater supply has been severely impacted by past industrial practices. LADWP has undertaken significant investments to remediate the groundwater supply and recover the use of this important local resource. At the same time, LADWP has been working with L.A. County Flood Control and the L.A. City Department of Public Works on a variety of projects to replenish the groundwater. Ranging from large infrastructure efforts like improving the Tujunga Spreading Grounds to neighborhood-level stormwater capture improvements, these projects will expand the capacity for capturing stormwater runoff and recharging groundwater aquifers.



Rendering of the Tujunga Spreading Grounds Enhancement Project, which will double the capacity for capturing stormwater that percolates into the basin.

Water conservation is also a key strategy for enhancing the local water supply. But while L.A.'s residents and businesses are vigilant about saving water (water use was lower in 2019 than it was in 1970 despite over one million more residents), conservation efforts alone won't ensure we can meet L.A.'s future water needs.

"The purchased imported water supplies are such that almost annually we get less water allocated even under normal conditions, and the availability of this water will only worsen," Villegas said. "With population growth and changing hydrology, there will be increased demand on purchased imported water supplies. We need to be less dependent on that supply so we can ensure city's vitality for next 100 years."

Collaborations

Given the initiative's enormity (the estimated cost of Operation NEXT and Hyperion 2035 is over \$8 billion), LADWP is engaged in two pilot projects with LASAN to study the feasibility of converting Hyperion into a fully advanced water purification facility. LADWP and LASAN are collaborating on the Hyperion Advanced Water Purification Facility that will serve nearby Los Angeles International Airport. The pilot project will provide 1.5 MGD of advanced treated recycled water for heating, cooling, toilet flushing and other non-potable uses.

The second pilot project is to develop a 1 MGD Hyperion Membrane Bioreactor (MBR) Pilot Facility that will compare and monitor three MBR systems side-by-side. The goal is to determine the best treatment technology for the future full transformation of Hyperion to recycle 100 percent of the available wastewater for beneficial use.

Challenges and Next Steps

Once the purified recycled water from Hyperion is ready, one of the biggest challenges will be distributing and storing the new water source. Villegas' team is working with the Water Replenishment District of Southern California, which is the Watermaster of the West Coast and Central Groundwater Basins, on a joint masterplan to evaluate the best groundwater locations for injecting and extracting Hyperion purified recycled water. Scheduled for completion in 2022, the plan will identify preferred locations for injecting the purified recycled water into aquifers within the local groundwater basins.

LADWP also plans to convey to the purified recycled water to the San Fernando Groundwater Basin, where it would eventually be extracted, treated, and blended into the drinking water distribution system. Should DPR regulations allow, LADWP's strategic priority will be to send the purified recycled water to the Los Angeles Aqueduct Filtration Plant in Sylmar for further treatment and integration with water from imported sources. Additionally, LADWP is collaborating with MWD on integrating this new local water supply into the agency's Regional Recycled Water Program Backbone System, which is another major DPR program in Southern California.

One of the biggest hurdles for LADWP will be building virtually an entire new water distribution system, complete with new pipelines, pump stations, tanks, treatment facilities and well fields. The system will need capacity to distribute up to 200,000 acre-feet of this new local water to the groundwater basins and the filtration plant.



LADWP Manager of Water Resources Delon Kwan speaks to a recent gathering of the Water System Stakeholder Engagement Group. Outreach will be a key part of the success of Operation NEXT. (Photo by Chris Corsmeier)

The necessary infrastructure projects will touch almost every portion of the city from Sylmar to the

Harbor area. Towards that end, LADWP expects to begin a programmatic environmental review process under the California Environmental Quality Act (CEQA) in early 2021, along with broad community engagement and outreach to increase awareness and understanding of L.A.'s future water needs and Operation NEXT.

“We will build upon the strong relationships and public support gained over more than a decade of concerted community engagement about the city’s need to secure an independent and resilient local water supply for Los Angeles,” said Paul Liu, Manager of Recycled Water and Groundwater Resource Planning, Policy, and Management Section.

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