

Recycled water is the most viable option, providing a reliable, drought-proof approach for augmenting local and imported water sources.

Rincon del Diablo Municipal Water District – Rincon del Diablo Municipal Water District provides recycled water for landscape irrigation and industrial purposes to its customers through a purchase agreement with the City of Escondido. Rincon del Diablo has identified Escondido Valley Groundwater Basin as holding the most promise for potable reuse. The basin has storage capacity of 24,000 AF and is currently used for limited groundwater production, which could be expanded.

Vallecitos Water District – Vallecitos Water District is looking at San Marcos Valley Groundwater Basin as a possible potable reuse site. The basin is located near Highway 78 and San Marcos Boulevard with an estimated recharge capacity of 4,600 AFY. Purified water to recharge the basin would come from the Meadowlark Water Reclamation Facility, which currently treats water to tertiary levels.

City of Escondido – The City of Escondido is examining potable reuse options at Lake Dixon. Purified water produced at a newly constructed Escondido Advanced Water Treatment Facility would be pumped into Lake Dixon and then distributed as potable water within the city's service area following additional treatment at the Vista/Escondido Water Treatment Plant. Proposed facilities would produce 2,800 AFY of purified water to be used for IPR in the short term. Long-term purified water production could increase by 5,000 AFY by 2035.

Santa Fe Irrigation District – To increase the use of recycled water throughout its service area, Santa Fe Irrigation District is exploring numerous strategies both as a single entity and in cooperation with other coalition members. Currently, the district is looking into potable reuse at San Dieguito Reservoir, which it jointly owns with San Dieguito Water District. Purified water stored within the reservoir would be treated at the existing R.E. Badger Water Filtration Plant, which is also jointly owned with San Dieguito Water District.

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The Changing Regulatory Environment

The State of California is in the process of finalizing draft regulations for groundwater augmentation projects using purified water, which will be available by 2016 as mandated by Senate Bill 918 (2010). Other regulatory activities include determining the feasibility of developing uniform water recycling criteria for direct potable reuse by end of 2016.

Because the characteristics of each project vary throughout California, regulatory agencies have stated that recommendations for potable reuse projects will be made on an individual case basis and will be based on all relevant aspects of each project, including the treatment provided, effluent quality and quantity, spreading area operations, soil characteristics, hydrogeology, residence time, and distance to withdrawal. While each individual scenario may be different, the overriding goal remains the same: produce purified water that at all times is of a quality that fully protects public health.

Conclusion

Non-potable water reuse, indirect potable reuse, and direct potable reuse have been occurring with remarkable success both in Southern California and around the world for decades. With new, high-tech membrane water purification technologies – a water purification breakthrough not unlike the computer chip for the communications industry – wastewater purification can produce even safer, higher quality, locally controlled, and more reliable water in the future.

The North San Diego Water Reuse Coalition is following the model suggested by the National Research Institute as we work collaboratively to bring enhanced water reliability to our region. We urge you to get involved in supporting the incorporation of more water reuse into our water portfolio by supporting the North San Diego Water Reuse Coalition.

Fact Sheet



NORTH SAN DIEGO
WATER REUSE
coalition

Potable Reuse: The Need, Safety, and Examples of Highly Successful Projects

For decades, semi-arid Southern California has depended on Northern California and the Colorado River for much of its drinking water. But environmental stresses, drought in the Colorado River basin, and reduced snowpack and runoff in Northern California have decreased the available water supply. Court-ordered pumping restrictions to protect threatened fish species have also severely reduced the amount of water that can be delivered by the State Water Project from Northern California. For all these reasons, imported water is becoming more expensive and less available. But the demand for water is increasing from industry, agriculture, and a growing population. Studies indicate that Southern California's population could increase by 3 million people by 2020 and San Diego County's by nearly half a million.

To ensure a vibrant future for our region, it is imperative we take advantage of new water supplies. Recycled water is the most viable option, providing a reliable, drought-proof approach for augmenting local and imported water sources. The uses for recycled water are numerous, including:

- **Landscape irrigation, industrial processes, and agricultural purposes.** The quality of non-potable recycled water can easily be matched to the demand of its usage and is recognizable by its purple-pipe distribution system.
- **Potable Reuse.** Advanced treated recycled water that meets all drinking water standards is added to a groundwater basin or reservoir where it blends with water from other sources. This process is called indirect potable reuse (IPR). Advanced treated recycled water can also be added directly into an existing potable water system, upstream or downstream of a water treatment plant.



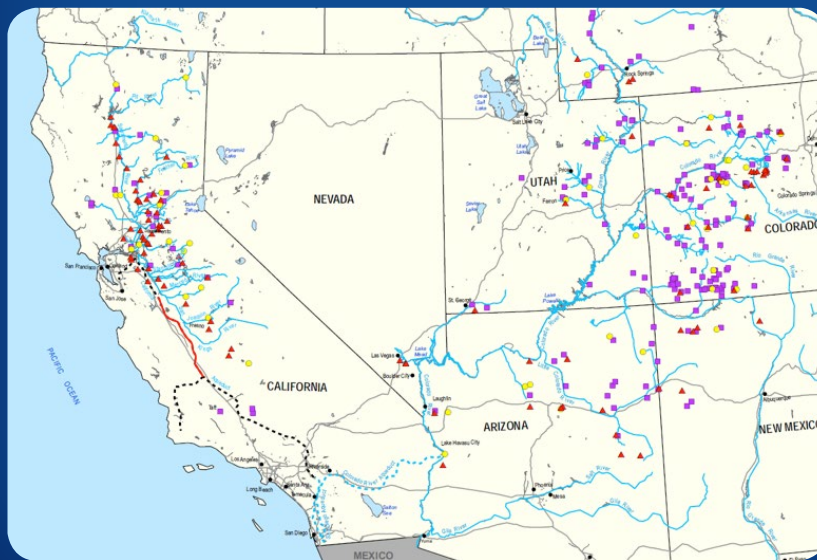
Statewide imported water infrastructure

■ Reliable ■ Drought-Proof ■ Environmentally Responsible ■ Cost-Effective

Planned vs. Unplanned Indirect Potable Resue

Purifying and reusing wastewater for use as a source of drinking water is not only technically feasible, it can be less expensive and more environmentally friendly than desalting seawater or importing water from hundreds of miles away. It's a reliable source of water that is impervious to drought, climate change, and fluctuating availability and cost of imported water supplies. Most importantly, it's perfectly safe.

Reusing purified wastewater as a drinking water supply occurs on both a **planned** and **unplanned basis**. Planned IPR involves purposefully reusing water for drinking purposes. Unplanned IPR takes place on nearly every river system throughout the world, including the United States. For instance, an upstream community will take water out of the river or stream, purify it, use it, and return it to the river or stream. Another city downstream extracts the water from the same river or stream, purifies it, uses it, and the process repeats. The Mississippi River is an example where this is done repeatedly until the water reaches the ocean. In the case of San Diego County, imported water from the Colorado River and Northern California contains treated wastewater effluent and is already part of our overall drinking water supply.



The map shows the existing wastewater treatment plants (different colored dots based on size of the treatment facilities) that discharge effluent to the Colorado River and Northern California river systems. (Source: City of San Diego, Water Purification Demonstration Project Report, March 2013)

Highly Successful Potable Reuse Projects

Regional Potable Reuse Projects

Groundwater Replenishment System, Orange County, CA – A joint project of Orange County Water District (OCWD) and Orange County Sanitation District (OCSD), the Groundwater Replenishment System (GWRS) came online in January 2008. Award-winning and recognized worldwide, GWRS is the largest advanced water purification facility of its kind, producing up to 70



million gallons per day (mgd). Purified water is pumped to recharge basins where it naturally filters into the groundwater basin, replenishing scarce drinking water supplies. Using up to two-thirds less energy than it would take to import water from Northern California and three times less energy than ocean desalination, GWRS produces enough water for nearly 600,000 residents annually.

Water Purification Demonstration Project, San Diego, CA – The City of San Diego commissioned the Water Purification Demonstration Project (WPDP) in 2007 to determine the feasibility of turning recycled water into purified water that could be sent to a local water supply reservoir and later treated and distributed as drinking water. The WPDP commenced two



years later with a state-of-the-art advanced water purification facility, located at the North City Water Reclamation Plant. The facility produces 1.0 mgd using the most advanced water purification technologies available, including microfiltration, reverse osmosis, and ultraviolet light with hydrogen peroxide. The project has proven that purified water can be produced and safely added

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to San Vicente Reservoir as part of a full-scale potable reuse project. The California Department of Public Health and the San Diego Regional Water Quality Control Board have granted conceptual approval of the reservoir augmentation plan. This project is vital to San Diego's future and is a critical step towards developing a local, sustainable, and reliable water supply.

West Basin Water Recycling Project, Los Angeles County, CA – West Basin Municipal Water District's wastewater purification facility in El Segundo has been online since 1995. It is the only water purification plant that makes five different types of customer-requested waters: irrigation water, high-pressure boiler feed water, low-pressure boiler feed water, cooling tower water, and seawater barrier



water, which ultimately becomes groundwater. West Basin MWD has over 100 miles of recycled water pipelines in the ground and has passed the 100-billion-gallons produced mark.

Inland Empire Utilities Agency - Recycled Water Program, Riverside County, CA – The Inland Empire Utilities Agency (IEUA) owns and operates five wastewater treatment facilities with influent flows of over 53 mgd. IEUA has a recycled water system that delivers approximately 27 mgd to its member agencies. Recycled water is used for irrigation, farming, landscaping, commercial, industrial, and groundwater recharge for potable reuse purposes.



Potable Reuse Projects Around the Globe

Israel leads the world in the proportion of water it recycles, treating 80 percent of its wastewater (290 mgd). One hundred percent of the wastewater from the Tel Aviv metropolitan area is treated and reused as irrigation water for agriculture and public works.

The second largest water reclamation program in the world is in Spain, where 12 percent of the nation's wastewater is treated for reuse. Australia is also making significant strides in increasing its use of treated wastewater, especially in the cities of Adelaide, Sydney, and Brisbane.

Singapore's NEWater program, which is modeled after the Groundwater Replenishment System, uses the same three-step purification process of microfiltration, reverse osmosis, and ultraviolet disinfection.

Proposed North San Diego Water Reuse Coalition Projects

Our Innovative Regional Approach to Water Supply

Today, a coalition of 10 northern San Diego County agencies is exploring a regional approach to increase local supplies and reduce demand for imported water. Our combined efforts will maximize recycled water use, establish a more efficient, interconnected distribution system, and, by building new water purification facilities where they are needed, will increase the supply of recycled water available to our customers. As a side benefit, we will be able to add greater efficiencies to our operations, while helping to protect the environment.

This regional approach also makes the coalition a stronger candidate for state and federal grants, which is already working. To date, the North San Diego Water Reuse Coalition (NSDWRC) has been awarded nearly \$5 million in state funding for recycled water infrastructure.

Proposed Potable Reuse Projects

NSDWRC has identified potable reuse concepts both short- and long-term to benefit the region it serves. Short-term, there is an opportunity to increase water reuse by more than 18,500 acre-feet per year (AFY) by 2025. Long-term, proposed projects could potentially produce more than 34,000 AFY of recycled water for potable and non-potable reuse purposes by 2035. Below is a snapshot of these efforts and proposed projects.

City of Oceanside – Only a small amount of recycled water is currently produced at the city's San Luis Rey Water Reclamation Facility for non-potable uses, including golf course irrigation and for use at Whelan Lake. To increase the use of recycled water, the city is now investigating IPR opportunities at Mission Basin, a groundwater basin running along the San Luis Rey River from approximately Vista Way and Mission Road to the coast. Augmenting Mission Basin with purified water from the San Luis Rey Wastewater Treatment Plant would also improve the overall quality of the groundwater, which is currently brackish.

Olivenhain Municipal Water District – Indirect potable reuse at San Elijo Valley Groundwater Basin is among the numerous concepts being investigated by Olivenhain Municipal Water District. The agency conducted a study in 2013 to evaluate the feasibility of a 1,100 AFY IPR project at San Elijo Valley, and is also looking at San Dieguito Valley Groundwater Basin for aquifer storage and a recovery project that would use water from the basin as a source of irrigation supply. Depending on the outcome of a 2014 study conducted on the San Dieguito Basin, this potable reuse site may produce up to 1,100 AFY of water supply in 2025 through combined use of groundwater supplies. It's anticipated that 550 AFY of purified water would be used for potable reuse at San Elijo Valley and another 550 AFY would be used for potable reuse at San Dieguito Valley by 2025.