The City of SAN DIEGO

*Completing our Water Cycle, Securing our Future*

**Pure Water San Diego** Program

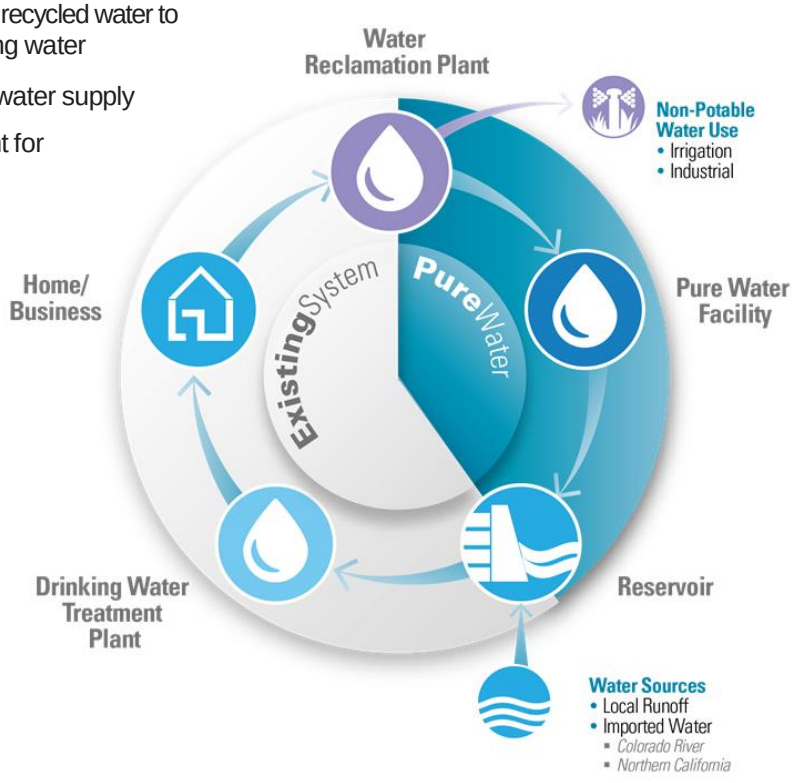
# **Why** is **Pure Water San Diego** Being Implemented?

***San Diego relies on importing 85% of its water supply from the Colorado River and Northern California Bay Delta. The cost of this imported water has tripled in the last 15 years and continues to rise. With limited local control over its water supply, the City of San Diego is more vulnerable to droughts, climate change and natural disasters.***

## **What** is **Pure Water San Diego?**

Pure Water San Diego is a phased, multi-year program that will provide 1/3 of San Diego's water supply locally by 2035. The Pure Water Program:

- Uses proven technology to clean recycled water to produce *safe*, *high-quality* drinking water
- Provides a *reliable*, *sustainable*, water supply
- Offers a *cost-effective* investment for San Diego's water needs

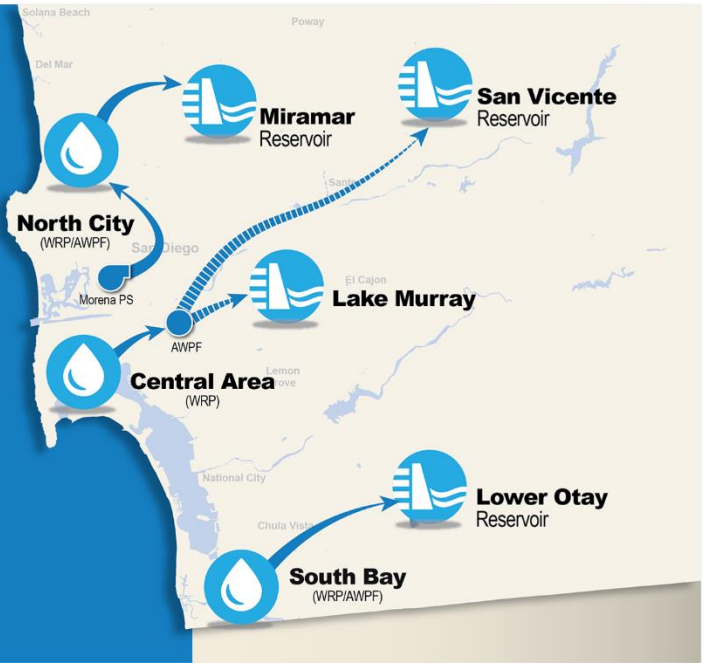



## **How** Does the **Pure Water Program Work?**

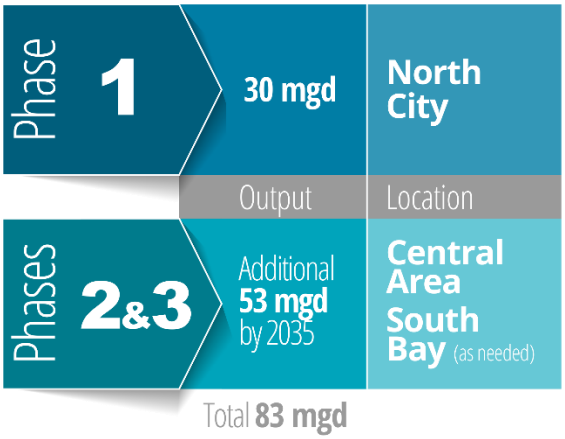
With San Diego's existing water system, only 8% of the wastewater leaving homes and businesses is recycled; the rest is treated and discharged into the ocean. The Pure Water Program transforms the City's water system into a complete water cycle that maximizes our use of the world's most precious resource—water.

# **Where** is the **Pure Water** Program?

**The Pure Water facilities will be located throughout the City of San Diego and are grouped into three geographical areas to facilitate implementation: North City, Central Area and South Bay (shown on map).**

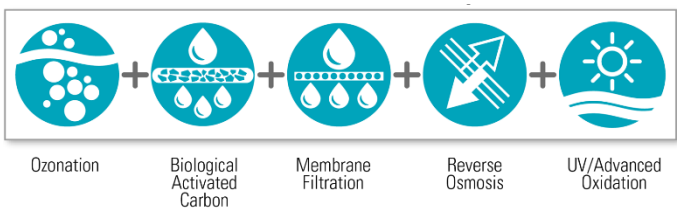



## **When** will the **New Facilities** be Built?




**mgd = million gallons per day*

## **What** are the **Steps** of the **Water Purification Process?**




Since June 2011, the City has produced 1 million gallons of purified water every day at its Pure Water Demonstration Facility.

More than 50,000 water quality tests have confirmed the water is safe and meets all federal and state drinking water standards.

Local **residents**, community **groups**, environmental **organizations** and local **businesses** support the **Pure Water Program.**

Do you **support Pure Water?** Like us, follow us:

***@PureWaterSD***

## **Want** to Know **More?**

Visit www.PureWaterSD.org to sign up for a free tour of the Pure Water Facility or request a presentation for your organization.

Pure Water San Diego

Pure Water San Diego Phase 1 Projects

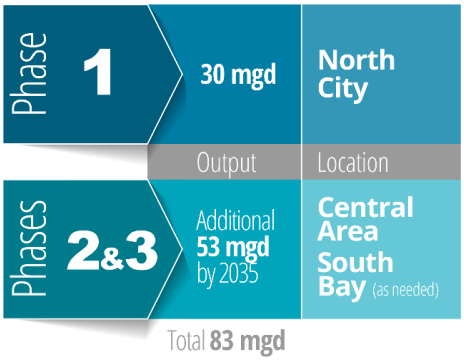
The City of SAN DIEGO

*Completing our Water Cycle, Securing our Future*

# What is Pure Water San Diego?

Pure Water San Diego is the City of San Diego's (City) program that will provide one-third of San Diego's water supply locally by 2035. The Pure Water Program will include a system of treatment facilities, pump stations and pipelines that will be constructed in multiple phases and will:

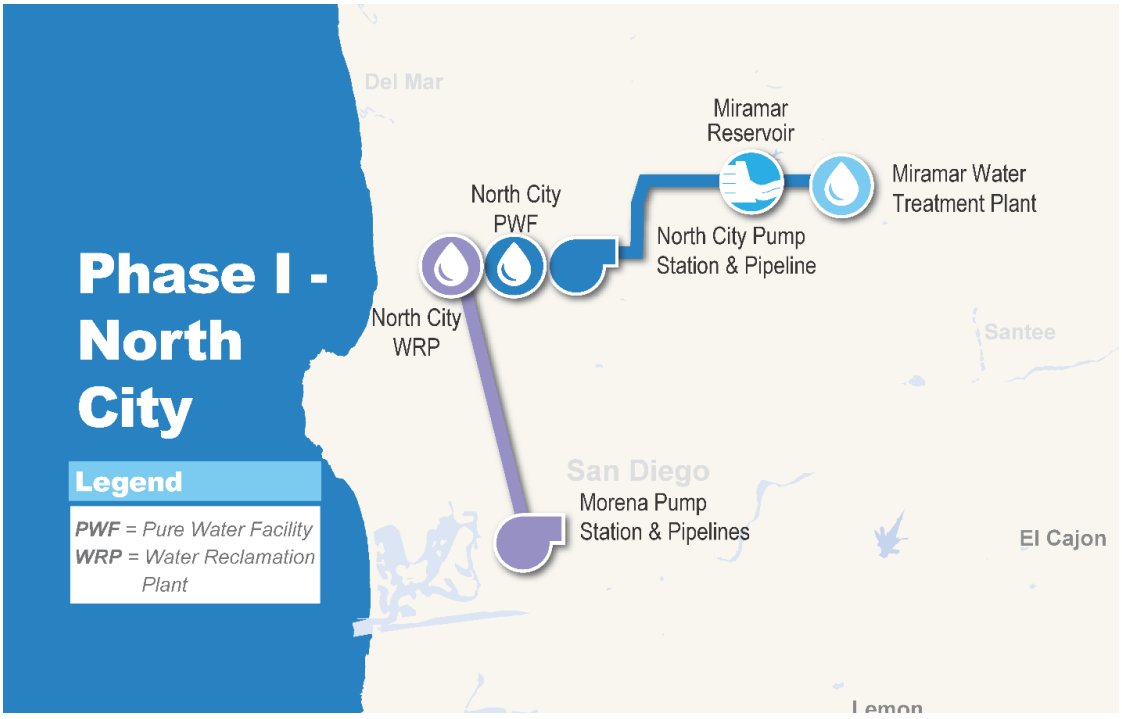
- Use proven technology to clean recycled water to produce safe, high-quality water
- Provide a reliable, sustainable, water supply; and
- Offer a cost-effective investment for San Diego's water needs.




**mgd = million gallons per day*

## What does Phase 1 Include?

Phase 1 - North City is comprised of several projects that will deliver 30 million gallons per day (mgd) of purified water to Miramar Reservoir. The purified water will blend with the City's imported and local water sources and be treated again at the Miramar Drinking Water Treatment Plant and distributed to the public. The projects include the Morena Pump Station and Pipelines, the North City Water Reclamation Plant Expansion, the North City Pure Water Facility, and the North City Pure Water Pump Station and Pipeline. A detailed map of the project locations can be viewed online at phase1.purewatersd.org.



## Morena Pump Station and Pipelines

This project will transport approximately 32 mgd of wastewater to the North City Water Reclamation Plant (NCWRP), where it will be treated before being sent to the new North City Pure Water Facility (NCPWF) for further purification. Construction will include a new pump station on Sherman Street and two parallel 10.7-mile-long wastewater pipelines. One wastewater pipeline will transport wastewater to the NCWRP, while the other will transport salt and contaminants removed during the water purification process at the NCPWF to the Point Loma Wastewater Treatment Plant. The wastewater pipelines will start at Sherman Street, follow West Morena Boulevard to Clairemont Drive, continue to Genesee Avenue and go through University City to the NCWRP on Eastgate Mall. This project will also include the construction of two approximately 3.5-mile water pipelines, a 16-inch water distribution pipeline and a 36-inch water transmission pipeline, which will run parallel to the wastewater pipelines along West Morena Boulevard and Morena Boulevard.

## North City Water Reclamation Plant Expansion

This project will increase the amount of recycled water the NCWRP produces to meet the needs of both the recycled water system and the new NCPWF. The NCWRP is located on Eastgate Mall and treats wastewater to recycled water standards for irrigation and industrial uses. The plant capacity would increase from 30 mgd to 52 mgd. A new pump station located at the NCWRP will convey up to 42 mgd of recycled water to the new NCPWF across the street for further purification.

## North City Pure Water Facility

A new Pure Water Facility will be built on Eastgate Mall across the street from the existing NCWRP to clean the recycled water further to produce 30 mgd of safe, high-quality water that meets all state and federal drinking water standards. The facility will use the proven five-step water purification process of ozonation, biological activated carbon filters, membrane filtration, reverse osmosis and ultraviolet disinfection with advanced oxidation.

## North City Pure Water Pump Station and Pipeline

This project will transport purified water produced at the NCPWF to Miramar Reservoir. A new pump station will be constructed next to the NCPWF on Eastgate Mall along with an 8.4-mile pipeline that will convey approximately 30 mgd of purified water to Miramar Reservoir. The pipeline will start on Eastgate Mall, follow Miramar Road, and continue through Scripps Ranch and end in the Miramar Reservoir.

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Local **residents**, community **groups**, environmental **organizations** and local **businesses** support the **Pure Water Program.**

Do you **support Pure Water?** Like us, follow us:

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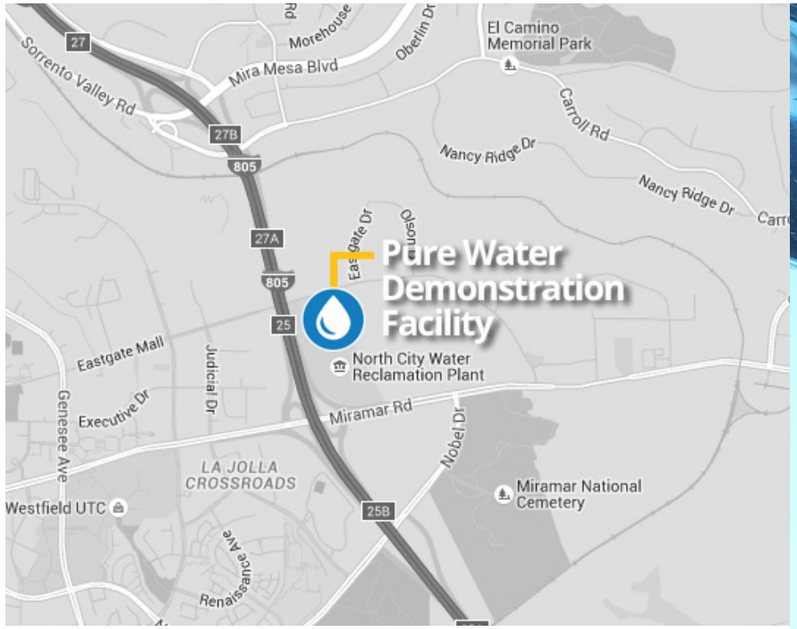
**Want** to Know **More?**

Visit www.purewatersd.org to sign up for a free tour of the Pure Water Demonstration Facility or request a presentation for your organization.

Pure Water San Diego

*The NCPWF will produce 30 million gallons of purified water per day. Learn more about the City of San Diego's Pure Water Program at www.purewatersd.org.*

*Request a presentation about Pure Water San Diego for your group or organization at presentations.purewatersd.org or call (619) 533-7572.*




## Tasting is **Believing**

You are invited to tour the Pure Water Demonstration Facility. During the walking tour, you will see and learn about each step of the water purification process up close and have the opportunity to taste the purified water produced at the facility.

The Pure Water Demonstration Facility is located at the North City Water Reclamation Plant at 4949 Eastgate Mall, San Diego, CA 92121. Register for a public tour at www.purewatersd.org/tours or call (619) 533-7572.

## Want to **know more?**

Visit www.purewatersd.org and sign up for a free tour of the Pure Water Demonstration Facility!

***@PureWaterSD*** ***PureWaterSD*** ***@PureWaterSD*** ***@PureWaterSD***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Pure Water San Diego

(REVISED 12-2018)

The City of SAN DIEGO

## A look at the technology behind

Pure Water San Diego

***A safe, reliable and sustainable drinking water supply for San Diego***

# Innovation for **San Diego's Water Future**

***Pure Water San Diego is the City's phased, multi-year program that uses proven water purification technology to clean recycled water to produce safe, reliable, high-quality water. Pure Water will provide 1/3 of San Diego's water supply locally by 2035.***

## The Purification **Process**

***The Pure Water Demonstration Facility began operating in June 2011 and purifies one million gallons of recycled water every day. Water quality tests have confirmed the purified water produced meets all federal and state drinking water standards. The facility's water purification process uses a multi-barrier approach of consecutive treatment steps which work together to remove or destroy contaminants. Each barrier includes frequent and continuous water quality monitoring, and safeguards are built into the process to ensure public health protection. Here is a look at the process, which starts with recycled water that is clean enough to be used for irrigation and industrial purposes:***

## The **Process**

### Barrier 1 **Ozonation**

Ozone is a gas produced by subjecting oxygen molecules to high electrical voltage. The ozone gas is infused into the water and the water travels through a long series of pipes, called the ozone contactor. The ozone destroys microorganisms and reacts with and breaks down contaminants in the water. Prior to the next step, the ozone is consumed and breaks down into oxygen.

### Barrier 2 **Biological Activated Carbon Filters**

Biological activated carbon (BAC) filters are filled with carbon granules covered in "aerobic" bacteria, which thrive in the presence of oxygen. The bacteria on the granules consume 30-50% of the organic matter (anything that is or was living). The "helpful" bacteria, along with any other bacteria still in the water, are removed in the next treatment step.

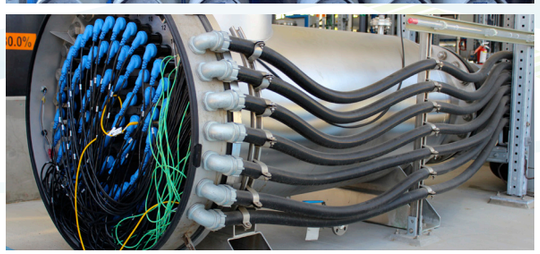
### Barrier 3 **Membrane Filtration**

Membrane filtration uses canisters filled with straw-shaped hollow fibers that provide 99.99% removal of microscopic particles including suspended solids, bacteria and protozoa. The filters are tested daily to confirm their consistent removal of contaminants. The pores in the fibers are smaller than 1/300 the diameter of a human hair.

### Barrier 4 **Reverse Osmosis**

Reverse osmosis uses high pressure to force water through spirally wound membranes that remove most salts and minerals, and 99% of dissolved organics, including pharmaceuticals and personal care products. This process is used by the bottled water industry.

### Barrier 5 **Ultraviolet Disinfection/ Advanced Oxidation**



Inside a reactor are 72 ultraviolet lights that break down the DNA of any microbes or viruses. At the same time, advanced oxidation generates powerful reactive molecules that oxidize and destroy any trace contaminants that may remain in the water.

***San Diego is among many innovative agencies implementing water purification technology to provide a safe, reliable and sustainable drinking water supply.***

# 2019


# Year in Review Report

The City of San Diego's Pure Water Program started pre-construction activities this year and continues to make great strides in operator readiness, research and building community awareness. This report provides a snapshot of Pure Water's accomplishments and activities that took place in 2019.

The City *of*
SAN DIEGO


# Program Milestones

## January 2019

Nearly 150 people attend the Pure Water San Diego Contractor EXPO to learn about how to bid on Phase 1 contracts.

## February 2019

The Bureau of Reclamation awards the City of San Diego a $9 million grant through the WaterSMART Program.

## June 2019

Pre-construction activities start at the North City Water Reclamation Plant and future North City Pure Water Facility site.

## June 2019

More than 350 community members attend the third Pure Water Day Open House.

## July 2019

The City of San Diego receives a letter of approval from the Division of Drinking Water confirming that Pure Water can be used as a source for drinking water supply.

## September 2019

Bird Rock Coffee Roasters serves coffee brewed with Pure Water at the WateReuse Symposium in San Diego.

## September 2019

National water organizations recognize the City of San Diego Public Utilities Department as a "Utility of the Future Today" for Pure Water's public outreach efforts.

## December 2019

The Metropolitan Water District board votes to provide up to $285.6 million in incentives to the Pure Water Program.

Pure Water San Diego

Public Utilities

# Pure Water San Diego

## 2019 Public Outreach Program Highlights

More than **1,900** people toured the Pure Water Facility.

Presentations to more than **2,900** Community members

**44** Community Events

**30** Stakeholder Interviews

More than **220** Support Pledges from San Diegans

More than **21,600** website visits


# Phase 1 Project Outreach

The Public Utilities Department continued to engage and inform Phase 1 Working Group (WG) members in 2019. Two WG meetings were held to provide community members an update on construction bid specifications. The Pure Water team also met with businesses near the North City Water Reclamation Plant and North City Pure Water Facility site to inform them of the early site work.

## Pure Water San Diego Contractor EXPO

Nearly 150 contractors and consultants attended the Pure Water San Diego Contractor EXPO on Jan. 31 at the Balboa Park Recital Hall to learn about upcoming Phase 1 contracts and network with other contractors. Presentations were given on how to bid on upcoming Pure Water contracts and how Phase 1 projects will be implemented. Attendees also had the opportunity to network and develop partnerships with other contractors interested in forming teams. City staff and project team members were stationed at informational booths to answer questions about each of the projects.


# Pre-Construction Activities Begin

Pre-construction activities began at the North City Water Reclamation Plant (NCWRP) and future North City Pure Water Facility (NCPWF) site in June.

As part of the Pure Water Program, the NCWRP will be expanded from producing 30 million gallons per day (mgd) to 52 mgd so the City can continue to provide recycled water to its commercial customers, as well as provide recycled water to the future NCPWF, which will produce 30 mgd of purified water to be sent to the Miramar Reservoir.

Pre-construction activities at the NCWRP include utility relocations, infrastructure improvements, relocation of some of the components of the Pure Water Demonstration Facility and installation of electrical infrastructure.

# Pure Water Day Open House

On June 22, the City of San Diego hosted the third Pure Water Day Open House at the North City Water Reclamation Plant. With construction on the Phase 1 projects beginning, the Pure Water team provided a fun, family-friendly event to engage the community to learn how the Pure Water Program will benefit all San Diegans.

More than 350 community members toured the Pure Water Demonstration Facility, tasted the purified water, visited informational booths and explored the Kid Zone. A scavenger hunt map encouraged attendees to explore different areas of the event. City engineers informed and engaged attendees about the upcoming Pure Water Phase 1 pipelines and facilities that will be constructed.



# Operator Readiness

Pure Water San Diego is on the front lines of preparing operators for the new Advanced Water Treatment (AWT) certification.

The City of San Diego partnered with Trussell Technologies to develop a training program to prepare current drinking water and wastewater operators for the certification exam allowing them to work at AWT facilities.

Pure Water's Operations Supervisor, John Carroll, recently became one of the first operators to earn his certification and has been active in helping train staff.


# Miramar Reservoir Tracer Study

The Pure Water team conducted a tracer study at Miramar Reservoir in July 2019 to validate the performance of a hydrodynamic model used to show how water moves throughout the reservoir. The model is used to demonstrate regulatory compliance and public health protection and has also informed the design of the Pure Water Phase 1 projects. Initial results show that the model used is valid. Additionally, the 2019 tracer study allowed the City to gain practical experience for additional tracer studies that will be conducted as part of implementing Phase 1 of the Pure Water Program.

# Bird Rock Coffee Roasters Partnership


As part of the WateReuse Symposium, the Pure Water team partnered with Bird Rock Coffee Roasters, a local chain committed to sustainability and fair trade, to serve coffee brewed with purified recycled water produced at the Demonstration Facility. Both hot and cold brew coffee were served to more than 150 people at the WateReuse Symposium on Sept. 10. This partnership marked the first time potable reuse coffee was served at an industry conference. Fox 5 San Diego covered the partnership.

# Pure Brew San Diego Competition

As part of the WateReuse Symposium, the Pure Water team hosted the second Pure Brew San Diego competition at the Maritime Museum on Sept. 10. Homebrewers belonging to the Quality Ale and Fermentation Fraternity (QUAFF) brewed ten beers using water from the Demonstration Facility. 300 people attended the competition to sample the beers and voted for their favorites. The WateReuse Association awarded the first, second and third place winners with cash prizes. The first-place winner, a specialty IPA, received 100 votes. CBS 8 and NBC 7/39 both covered the event.


# Media Coverage

Pure Water was featured in mainstream and industry media for training, partnerships and programmatic accomplishments. The Pure Water team had the pleasure of hosting an international press delegation reporting on potable reuse. Newsline Magazine, a Pakistani media outlet, published an article outlining the innovative ways that California is addressing its water challenges and discussed Pure Water's advanced water purification process.

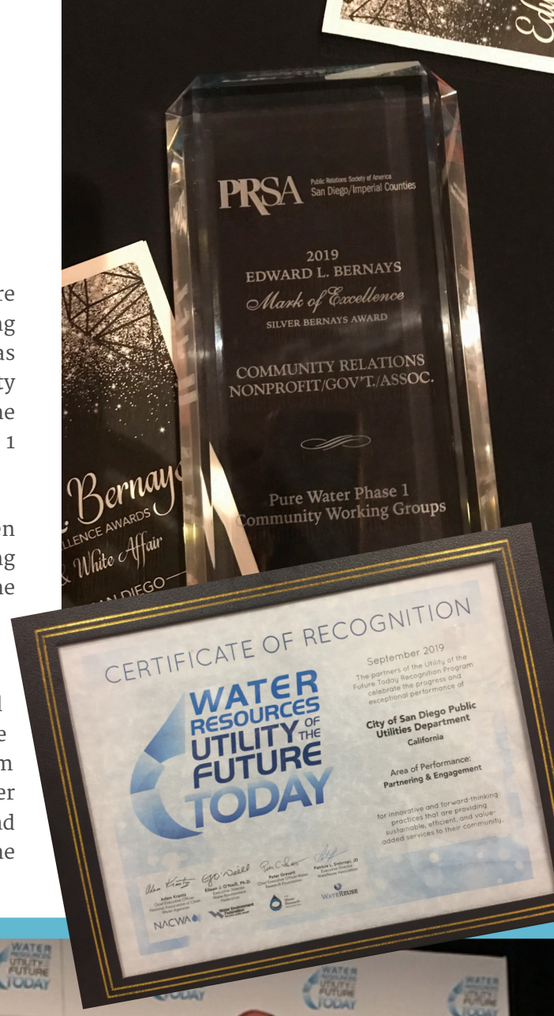
Deputy Director Amy Dorman was interviewed by Municipal Water Leader to discuss the Pure Water Program in their October issue. The article explained the need for potable reuse programs and how Pure Water factors into the reliability of San Diego's future water supply. Civil Engineering Magazine discussed how the Phase 1 projects will be built as part of a profile on water reuse projects around the nation.

# Recognition and Industry Presence

The City of San Diego received the Utility of the Future Today recognition for forward-thinking practices providing sustainable, efficient, and value-added services, as well as the Award of Excellence from the Public Relations Society of America San Diego/Imperial Counties Chapter for the comprehensive public outreach efforts with the Phase 1 Community Working Groups.

Presentations about the Pure Water Program were given at six conferences focusing on the challenges of managing implementation of a potable reuse program and the program's successful outreach efforts.

This year, the national WateReuse Symposium was held in San Diego from Sept. 8 to 11. A five-member panel consisting of City staff and consultants presented about the strategies and tactics utilized for the Pure Water Program involving regulations, stakeholder engagement, Pure Water Demonstration Facility research, operator readiness and getting into construction. Nearly 100 people attended the presentation.




# Pure Water San Diego

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