

# Pure Water San Diego Program

## Pure Water Facility Tour



### **Key Speaking Points:**

Welcome to today's tour of the Pure Water Facility.

My name is \_\_\_\_\_ and around the room are other members of the project team, if you have any questions or need assistance, please ask one of us.

We appreciate your interest in this future local water supply for San Diego.

We'll begin with a presentation and short video. Then, we'll tour the Pure Water Facility outside and reconvene in the downstairs lobby to take a group photo and to test your water knowledge. This tour experience will take approximately an hour.

### **Additional Notes:**

- Provide tour attendees with some information about your job with the City and what department you work in.



### Key Speaking Points:

- 85% of San Diego's water is imported from hundreds of miles away, from the Colorado River and Northern California's Bay Delta. San Diego is at the end of the imported water pipeline system.
- Hundreds of water agencies and cities discharge their treated wastewater into the Colorado River and Bay Delta, represented here by the colored symbols on the map.
- In essence, we are already drinking water that has been used before, and we are all downstream from somebody.

If asked what symbols represent:

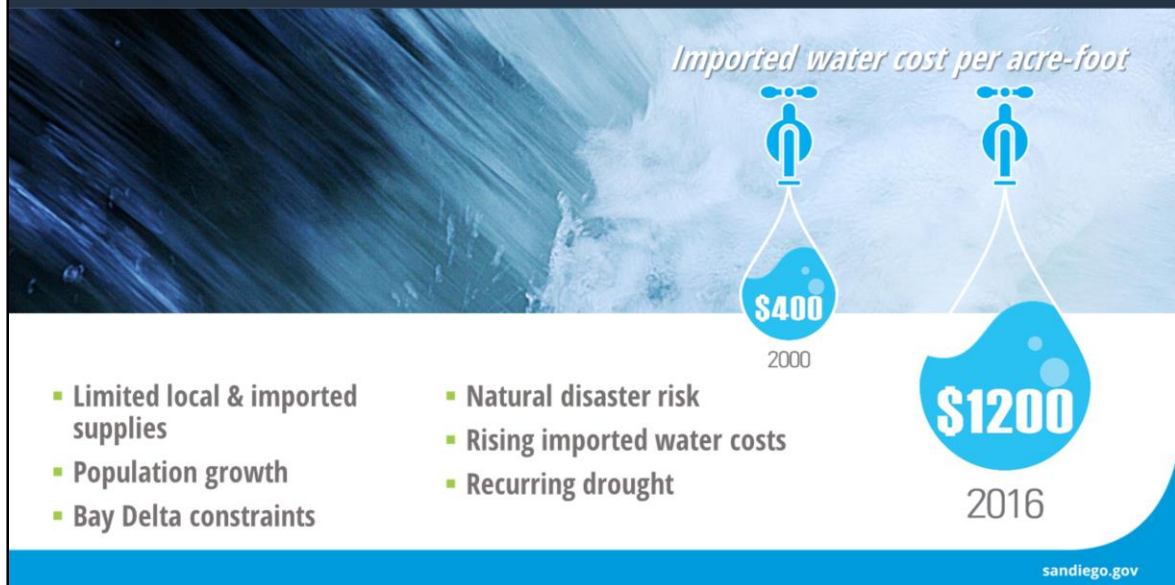
- Red triangle: greater than 1 mgd
- Purple square: less than 0.5 mgd
- Yellow circle: between .5 and 1 mgd

Additional Information:

There are 399 dischargers putting treated wastewater into the Colorado River and the State Water project which provide San Diego's water supply (317 dischargers for the Colorado River Basin and 82 dischargers for the Bay Delta Basin).



## We Face Numerous Water Challenges



### Key Speaking Points:

- Providing water to San Diego is not an easy task. San Diego faces a multitude of challenges to its water supply:
- **Limited Local Supplies**
  - San Diego has very limited local water supplies due to little rainfall. Only 15% of San Diego's water comes from local sources.
- **Population growth**
  - San Diego's population is growing, which means we will need more water.
- **Bay Delta constraints**
  - The impacts of the Endangered Species Act has constrained the ability to import water. Court decisions to protect endangered species in the Bay Delta now restrict when and how much can be pumped – meaning less water that San Diego can rely on every year.
- **Natural Disasters**
  - Some of the pipelines that import water to San Diego cross earthquake faults. A significant-sized earthquake could potentially result in an interruption in the delivery of water to San Diego for a period of time. Other disasters such as fires, tsunamis, and yet to be determined impacts from overall climate change now threaten the system that delivers our imported supplies.
- **Rising imported water costs**
  - Imported water costs have tripled since 2000. The cost of water is expected to continue to rise due to the following factors:
    - Aging infrastructure repair and refurbishment
    - Environmental stressors
    - Increasing cost of energy to pump and treat water
    - Investments in emergency storage and local supplies
- **Recurring drought**
  - Imported water is subject to interruption during droughts. California is currently in its fifth year of severe drought.

## SD Multi-faceted Approach



- Conservation
- Desalination
- Groundwater Development
- Recycled Water
- Pure Water Program

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### Key Speaking Points:

- Being at the end of the pipe has taught us to diversify our water supplies through strong regional and local water conservation efforts and investments in local supply projects.

### Water Conservation

- Water use efficiency and conservation measures have reduced the demand for water.
- Consumption levels are lower today than in 1990 despite a population increase of approximately 250,000.

### Desalination

- The San Diego County Water Authority recently began operating an ocean desalination plant in Carlsbad that produces 50 million gallons of water per day. That is equivalent to 7% of the county's water needs.
- Another desalination plant is under consideration at Camp Pendleton.

### Groundwater

- Production of groundwater as a water supply requires the extraction of water from underground reservoirs, known as aquifers.
- Viable groundwater in San Diego is limited and mostly found as saline brackish water. Brackish water requires an additional desalination treatment process prior to beneficial use.

### Recycled Water

- The City currently produces recycled water from the North City Water Reclamation Plant and the South Bay Water Reclamation Plant for irrigation and industrial purposes (Purple Pipe system). Both plants together can produce up to 45 mgd.
- This has reduced the use of drinking water for irrigation and industrial uses in parts of San Diego.

### Pure Water (potable reuse)

- The City is implementing potable reuse, meaning that it will clean recycled water further to produce a new drinking water supply for San Diego. The program is called Pure Water San Diego.

## SD What is Pure Water San Diego?



### Key Speaking Points:

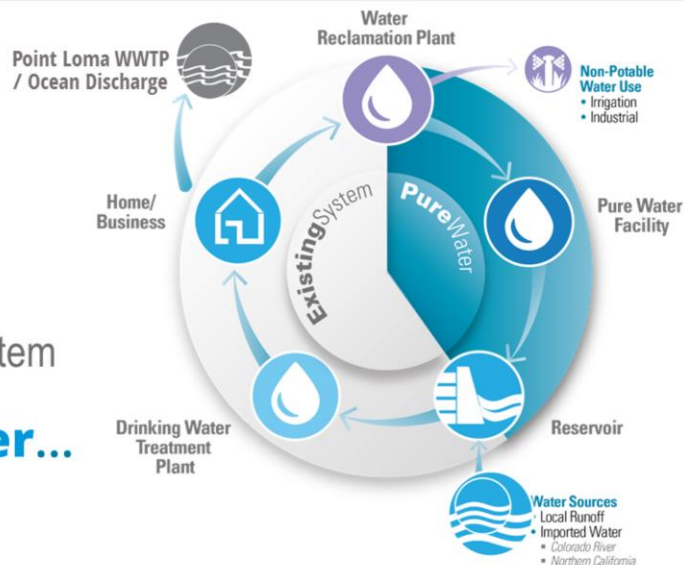
- Pure Water San Diego is a phased, multi-year program that will provide 1/3 of San Diego's water supply by 2035. Pure Water:
- Uses proven technology to clean recycled water to produce safe, high-quality drinking water.
- Provides a reliable water supply by diversifying our water supply sources and reducing our dependence on imported water.
- Offers a cost-effective investment for San Diego's water needs and will help ratepayers for generations.

## Existing System...

Primarily a Single-Use System

## Pure Water...

Completes Our Water Cycle



### Key Speaking Points:

#### Existing System

- Currently, San Diego's imported and local water supplies are stored in numerous reservoirs. That water is cleaned at a drinking water treatment plant before it is distributed to homes and businesses. The majority of our wastewater is sent to the Point Loma Wastewater Treatment Plant where it is cleaned and discharged to the ocean. A small portion (8%) of our wastewater is recycled at our two water reclamation plants and used for irrigation and industrial purposes.

#### Pure Water Completes the Water Cycle

- Pure Water San Diego will purify the recycled water produced at the water reclamation plant so that it can be added to the City's drinking water supply.
- When the Pure Water San Diego Program is implemented, the purified water will be blended with imported and local water supplies in a local reservoir. It will also be cleaned again at a local drinking water treatment plant before it becomes part of our drinking water supply.

For now, the purified water produced at the demonstration Pure Water Facility is sent to the current recycled water (purple pipe) system for irrigation and industrial use.

## SD Pure Water Runs a Successful Demonstration Facility



- **28,000** lab tests: **Met all standards**
- Water quality: **Exceptional**
- Energy use: **Renewable**

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### Key Speaking Points:

- The pilot Pure Water Facility that you will tour today has been in operation since June of 2011.
- Since June 2011, more than 28,000 laboratory tests have proven the water purification process is safe and reliable and the water produced meets all federal and state drinking water standards.
- The water produced is so pure it is nearly distilled water quality.
- The demonstration Pure Water Facility is powered by NCWRP's on-site cogeneration facility, which is powered by methane gas from the Miramar Landfill and MBC digesters.
- The majority of the Demonstration Facility is powered by renewable energy produced from the methane captured at the Miramar landfill. A majority of the power needed for Pure Water's Phase 1 – North City projects will be also be generated by renewable energy.

### Additional Information:

- From 2009 to 2013, the City conducted a demonstration project to determine the feasibility of using water purification technology to turn recycled water into water that is safe and clean to drink. A main component of the project was operation of the one-million-gallon per day Advanced Water Purification Facility that you will tour today.
- The cost to produce Pure Water is approximately \$1,700 - \$1,900 per acre-foot.

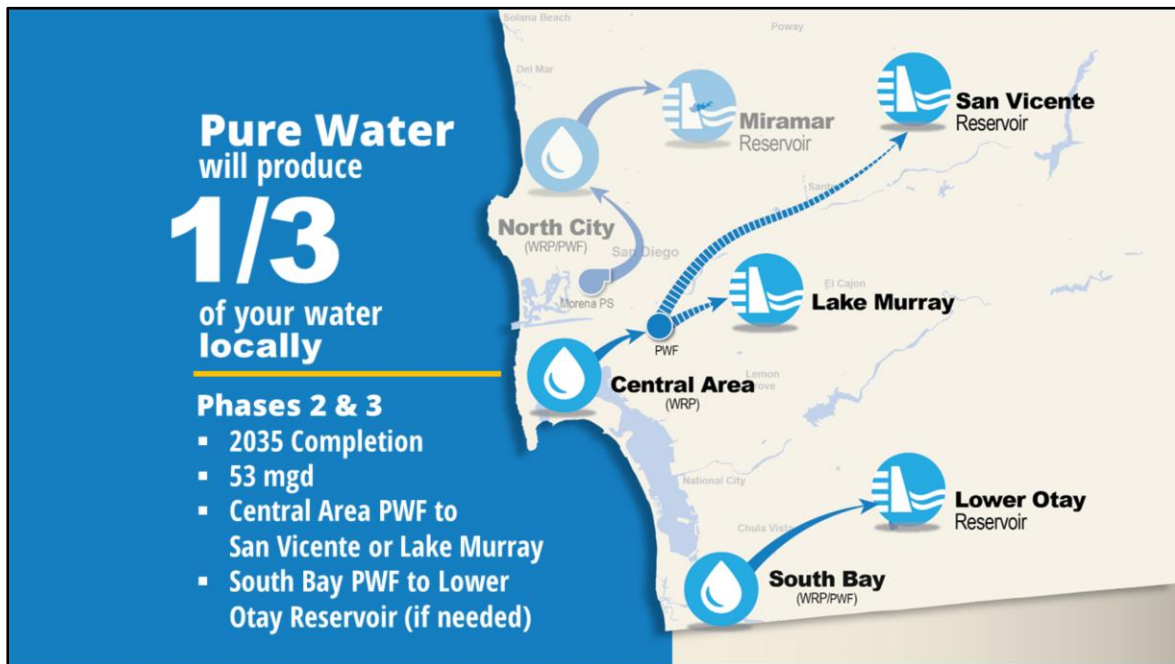
### Milestones:

- The report on the Demonstration Project was unanimously adopted by the City Council on April 23, 2013, and the report is available on the [PureWaterSD.org](http://PureWaterSD.org) website for review.
- On November 18, 2014, the City Council voted unanimously to approve the advancement of Pure Water San Diego.

**This video will explain the water purification process that  
you will see on today's tour.**







**Key Speaking Points:**

- Pure Water will produce 83 million gallons of water per day (mgd) by 2035. That is equivalent to 1/3 of San Diego’s future water needs.
- **Phase 1: 30 mgd at North City Facility by 2021**
  - The first Pure Water facility will be constructed here at North City and will produce 30 mgd of water beginning in 2021. The water produced at the North City facility will be stored in the Miramar Reservoir and treated again at the Miramar Drinking Water Plant before it is distributed to the public.
- **Phase 2: Additional 53 mgd at Central Area and South Bay facilities (if needed) by 2035**
  - An additional Pure Water Facility will be built in a Central Area of San Diego. The water produced there will be stored in either San Vicente or Lake Murray Reservoir and treated again at the Alvarado Drinking Water Plant before it is distributed to the public.
  - If needed, a third Pure Water Facility will be built in the South Bay area. The water produced there will be stored in the Lower Otay Reservoir and treated again at the Otay Drinking Water Plant before it’s distributed to the public.
  - One, or both, facilities will produce a total of 53 mgd starting in 2035.

## SD Morena Pump Station and Pipelines



- In order to support the current needs for recycled water production and the 30 mgd that will be produced by Phase 1 of Pure Water, additional wastewater supplies will be pumped from the Morena area to the North City Water Reclamation Plant (NCWRP).
- To do so, the City will construct a 32-mgd pump station on Sherman Street and an 11-mile, 48-inch wastewater pipeline that will start at Sherman Street, follow West Morena Boulevard and Clairemont Drive, and continue through University City to the NCWRP.
- Additionally, a second 11-mile, 48-inch pipeline will be constructed along the same route to convey the salts and contaminants removed from the water during the purification process to the Point Loma Wastewater Treatment Plant.
- Trenchless construction will be used to avoid environmentally sensitive areas and freeway crossings, including Tecolote Creek, Genesse Avenue, and interstate 805.
- This project is currently in design is expected to be completed in mid-2018.
- Construction of the pump station and pipelines is expected to take place from mid 2019-mid 2021.

## SD North City WRP Expansion



- The North City Water Reclamation Plant will treat the wastewater to recycled water standards – water that can be used for landscaping and irrigation – before it is sent to the North City Pure Water Facility for further purification.
- The NCWRP will be expanded to meet the needs of both the new North City Pure Water Facility and the existing recycled water system and will nearly double the amount of recycled water produced.
- This expansion is currently in design and will be completed in mid-2018.
- Construction at the NCWRP is expected to take place from early 2019-late 2021.

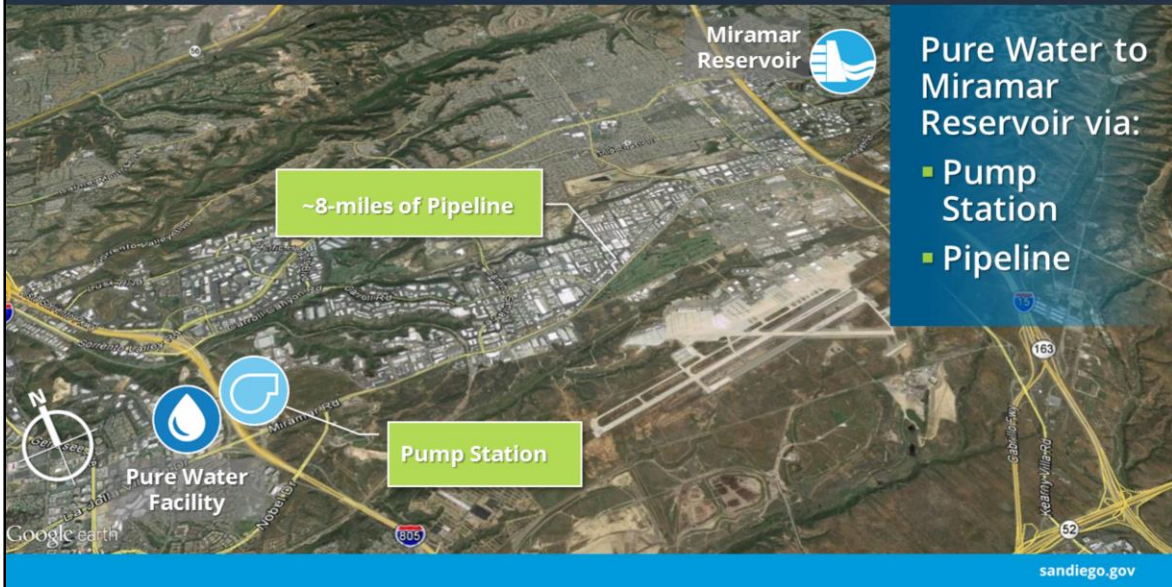
## SD North City Pure Water Facility



- The new North City Pure Water Facility will be built on Eastgate Mall across the street from the existing North City Water Reclamation Plant.
- It will clean the recycled water further to produce 30 mgd of safe, high-quality purified water.
- The North City Pure Water Facility will use the proven 5-step advanced water purification process tested at the demonstration Pure Water Facility.

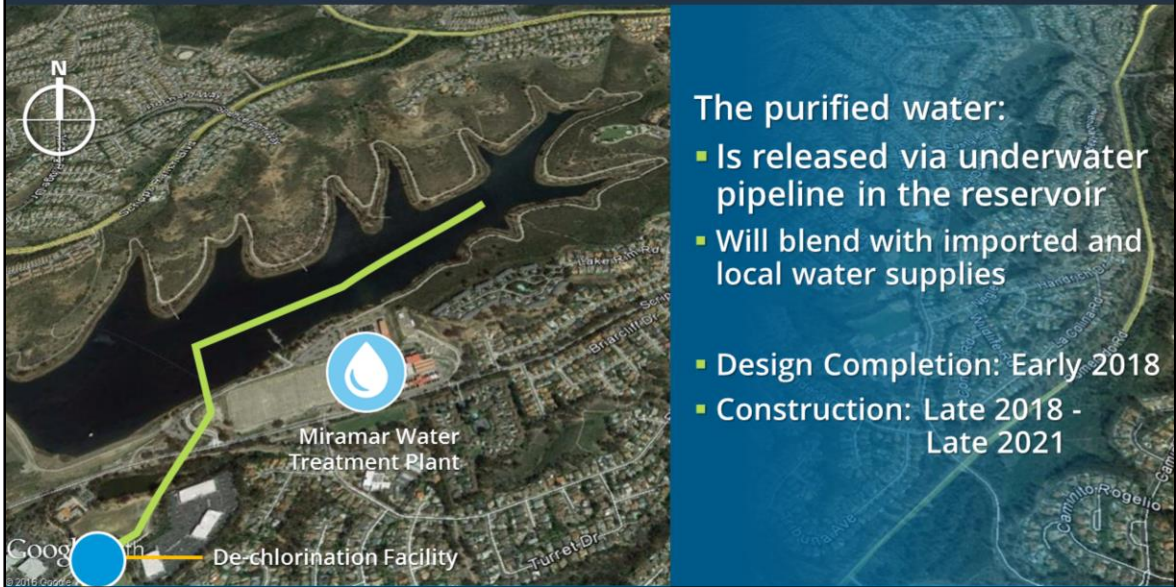


## North City Pure Water Pump Station and Pipeline



- The purified water produced at the North City Pure Water Facility will be conveyed to the Miramar Reservoir.
- A new pump station and 8-mile, 48-inch, pipeline will be constructed to transport the 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.

## SD Miramar Reservoir



### The purified water:

- Is released via underwater pipeline in the reservoir
- Will blend with imported and local water supplies
- Design Completion: Early 2018
- Construction: Late 2018 - Late 2021

- The purified water will be released into Miramar reservoir via a 1-mile underwater pipeline in the reservoir.
- The purified water will blend with imported and local water supplies and will then be treated at the existing Miramar Drinking Water Treatment Plant and sent to homes and businesses.
- The North City Pure Water Pump Station and Pipeline are currently being designed and design is anticipated to be completed in 2018.
- Construction is expected to take place from late 2018 to late 2021.

## SD What Can I Do?



[www.purewatersd.org](http://www.purewatersd.org)



Pure Water San Diego



PureWaterSD



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PureWaterSD

Join our **mailing list** and **sign a support card**

[sandiego.gov](http://sandiego.gov)

Please visit our website for more information, and follow/like us on our social media pages to stay up to date on our progress.

You can also stay involved by joining our mailing list, and you can show your support for the program by filling out a support card.

Another great way to get involved is to sign up for a free tour of the demonstration Pure Water Facility. Visit the website for more information on how to sign up, or get a flier from me after the presentation.

## SD North City Pure Water Facility



- The North City Pure Water Facility will use the proven 5-step purification process that consists of ozone, biological activated carbon filters, membrane filtration, reverse osmosis, ultraviolet disinfection with advanced oxidation.
- The facility is currently being designed and is expected to be completed in 2018.
- Construction is anticipated to commence 2019 and will be completed by 2021.

Additional Information:

### **Ozonation**

- Ozone gas destroys microorganisms and breaks down organic substances and contaminants.
- The ozone is consumed and breaks down into oxygen before the next step.

### **Biological Activated Carbon Filters (BAC filters)**

- Filters filled with carbon granules covered in “aerobic” bacteria consume 30-50% of organic matter, anything that is or was living at one time.
- Helpful bacteria along with other bacteria in the water are removed by membrane filtration, the next step.



**Membrane filtration**

- Contains hollow fibers that provide 99.99% removal of microscopic particles including suspended solids, bacteria, and protozoa.

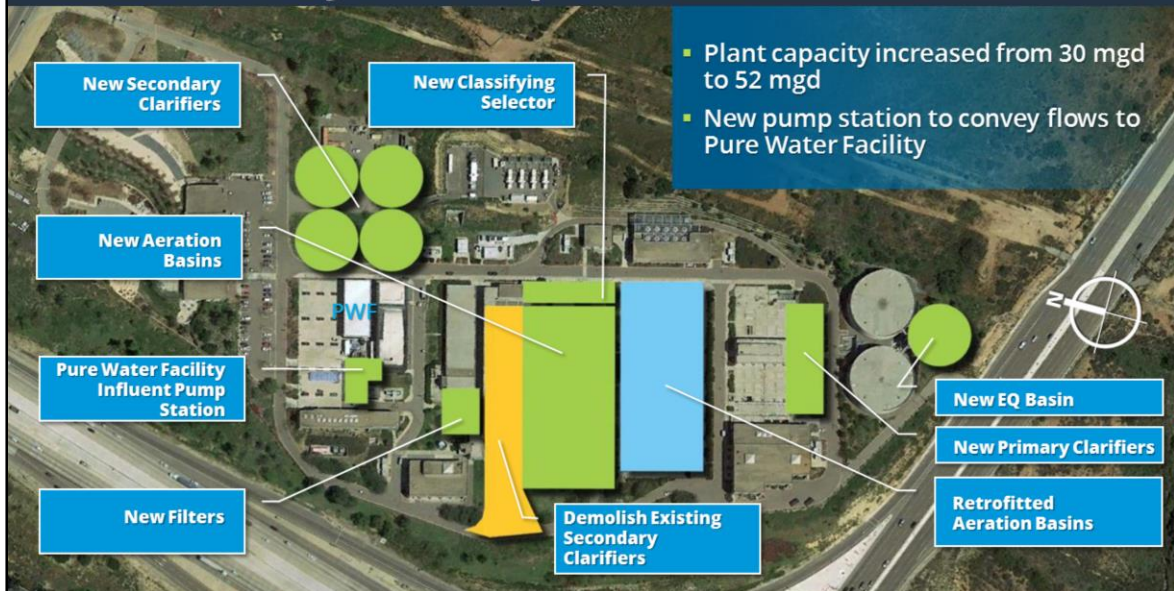
**Reverse Osmosis**

- Removes approximately 96-99% of salts, metals, dissolved organic molecules and other materials, many of which are more than 50,000 times smaller than the smallest bacteria or virus.

**UV Light/Advanced Oxidation**

- Inactivates 99.9999% of protozoa, bacteria, and virus present and takes approximately one second to do so.
- Sodium Hypochlorite is used to break down any remaining organic molecules that may be present in the water.

## SD North City WRP Expansion



- The capacity of NCWRP will be expanded from 30 mgd to 52 mgd to meet the needs of both the new North City Pure Water Facility and the existing recycled water system.
- Project includes a new 42-mgd stand-alone pump station and pipeline that will convey tertiary treated flows to the North City Pure Water Facility across the street on Eastgate Mall.