



City of
**Santa
Monica**

Sustainable Water Supply Program

4/12/2022

City of Santa Monica – Water Resources Division



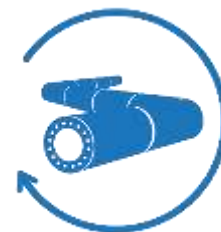
93,000+ residents
2,700+ commercial
customers



Drinking water and
fire protection



groundwater (local)
surface water (MWD)



Sewer collection and
recycled water

9 million gallons
of high-quality drinking
water daily

14 million gallons
of wastewater captured
and delivered for treatment
each day

77,000 gallons
per day of recycled
water

**4 water storage
reservoirs**

totaling 40 million gallons



City of
**Santa
Monica**

Goals of the City's Sustainable Water Master Plan

- Long term cost benefits for rate payers
- Diverse, sustainable, & drought resilient water supply to support a sustainable community
- Reduction of energy footprint to support carbon reduction goals for the City



PLAN AT A GLANCE

The CAAP is a guiding document that provides overarching policy direction to achieve the interim goal of an 80% reduction in emissions by 2050 and to increase Santa Monica's resilience to climate change hazards and impacts. This plan supports and enhances many existing plans and initiatives within the City. The CAAP also suggests new plans and actions to supplement ongoing efforts and create new initiatives.

CLIMATE ACTION

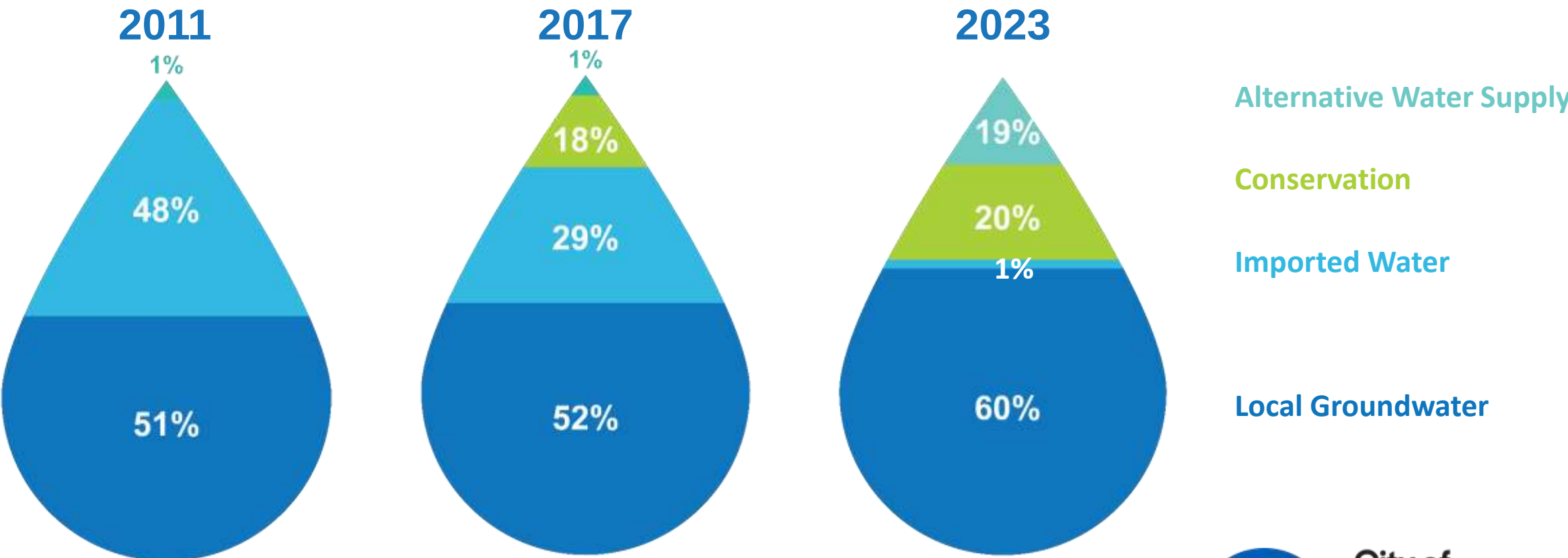
SECTOR	OBJECTIVES	SUPPORTING EFFORT
ZERO NET CARBON BUILDINGS	 • Achieve 100% renewable grid electricity • Install 100 MW of local solar energy • Reduce fossil fuel use 20% in existing buildings • Discourage fossil fuels in new buildings	• Zero net energy for new residential construction (2017) • Mandatory solar for new commercial construction (2017)
ZERO WASTE	 • Divert 95% of materials from landfills	• Plastic Bag Ban (2011) • Zero Waste Strategic Operations Plan (2014) • Disposable Food Serviceware Ordinance (2018)
SUSTAINABLE MOBILITY	 • Convert 50% of local trips to foot, bike, scooter & skateboard • Convert 25% of commuter trips to transit • Convert 50% of vehicles to electric or zero emission	• Land Use & Circulation Element (2010) • Bike Action Plan (2011) • Pedestrian Action Plan (2016) • Electric Vehicle Action Plan (2017)

CLIMATE ADAPTATION

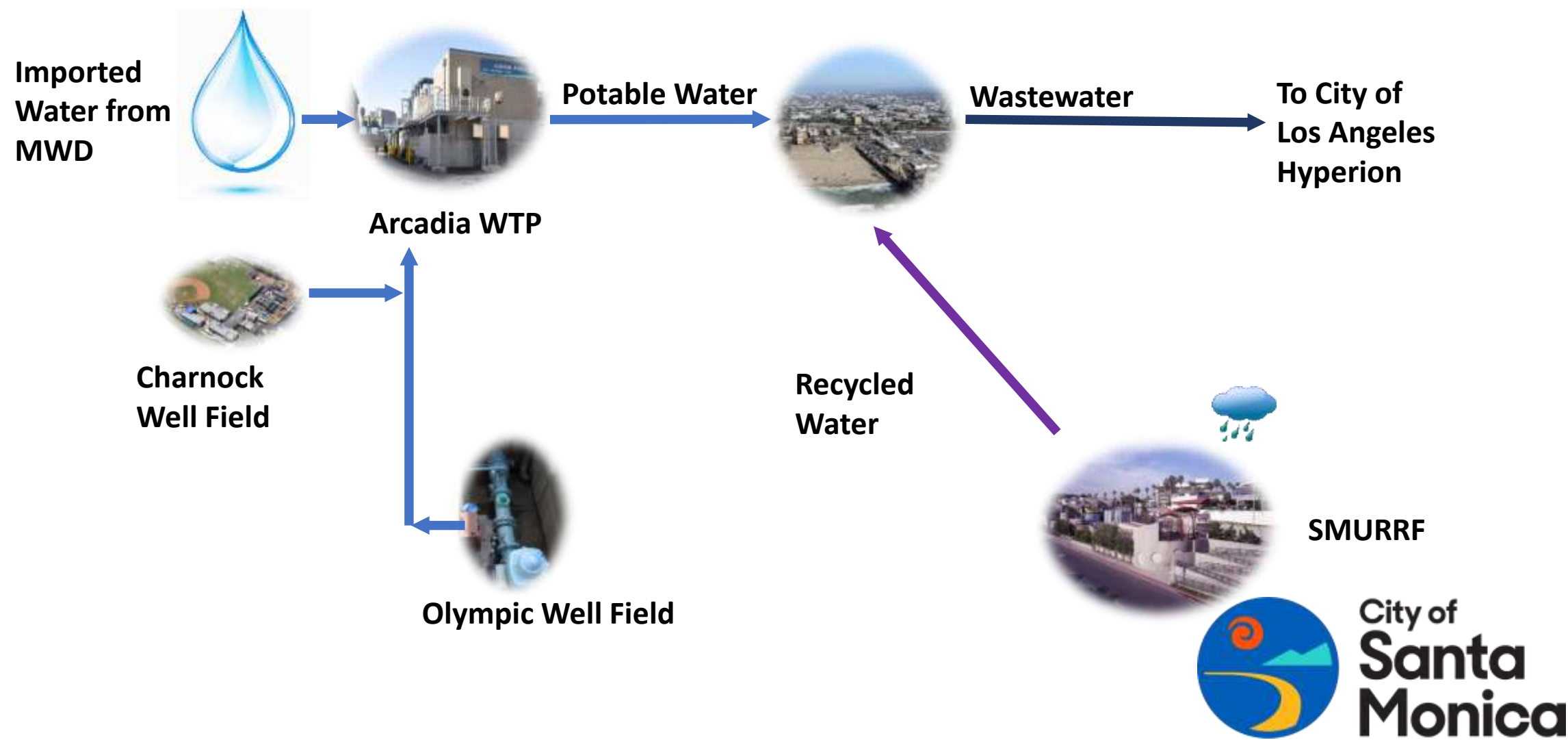
SECTOR	OBJECTIVES	SUPPORTING EFFORT
CLIMATE READY COMMUNITY	 • Increase community resilience to climate change • Protect vulnerable groups from impacts • Integrate climate change impacts into City planning, operations & infrastructure projects	• All Hazards Mitigation Plan (2015) • Santa Monica Organizations Active in Disaster (2018)
WATER SELF-SUFFICIENCY	 • Achieve water self sufficiency by 2025	• Water Neutrality Ordinance (2017) • Sustainable Water Master Plan (2018)
COASTAL FLOODING PREPAREDNESS	 • Enhance natural systems to prevent damage from coastal flooding • Increase resilience of public and private assets in the coastal flood zone	• Local Coastal Program Land Use Plan (2018)
LOW CARBON FOOD & ECOSYSTEMS	 • Increase self-reliance through local food production • Reduce or sequester carbon emissions from food production, consumption, waste and landscape management and natural processes	• Urban Forest Master Plan (2015)

The CAAP is not an element of the City's General Plan or a regulatory document for the purposes of streamlining the California Environmental Quality Act (CEQA) process. Any policy or ordinance described in the CAAP must be developed and adopted through a public review process.

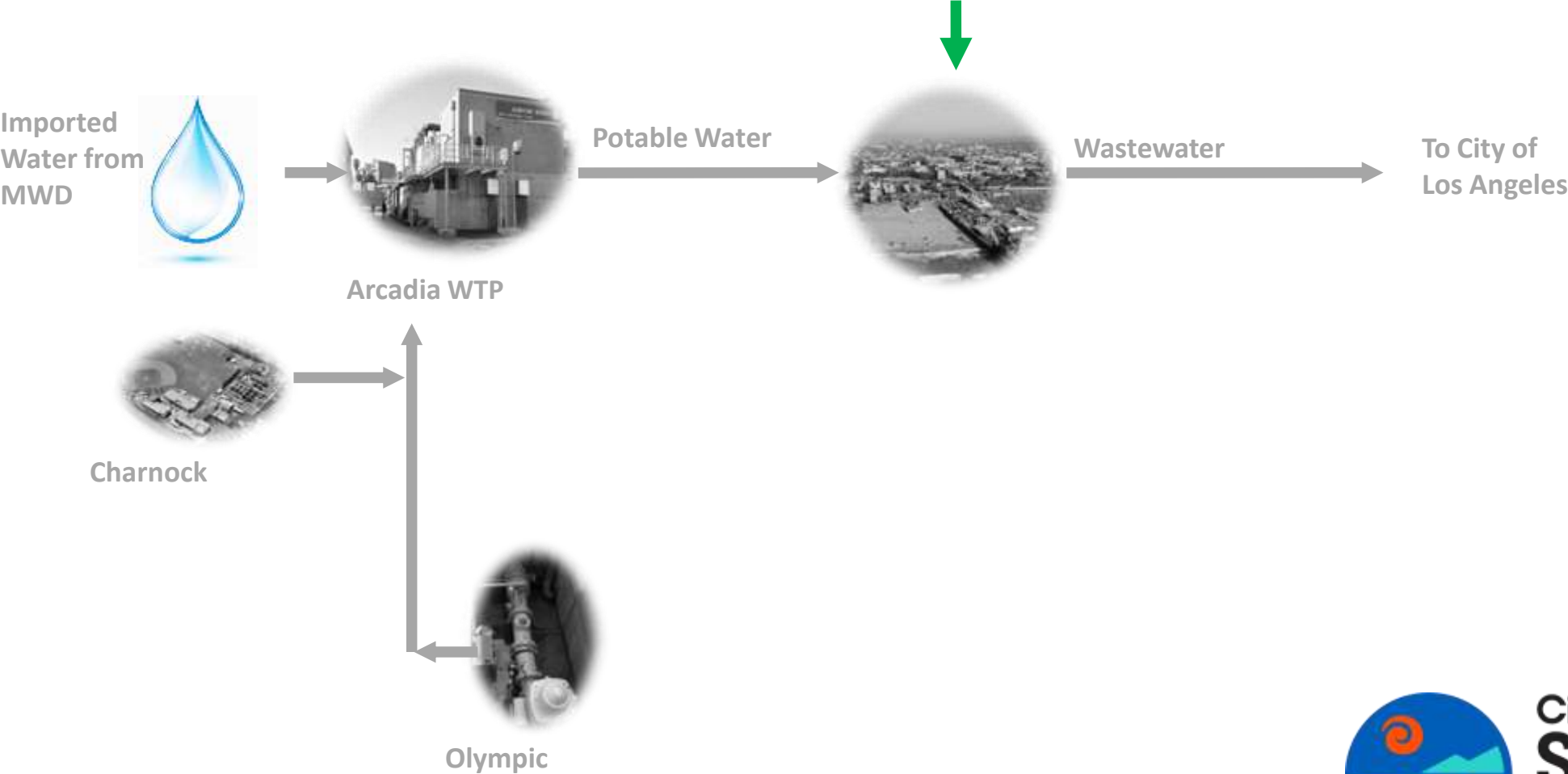
Diversifying Local Water Supplies for a Sustainable Future



One Water Approach to Maximize Local Water Resources

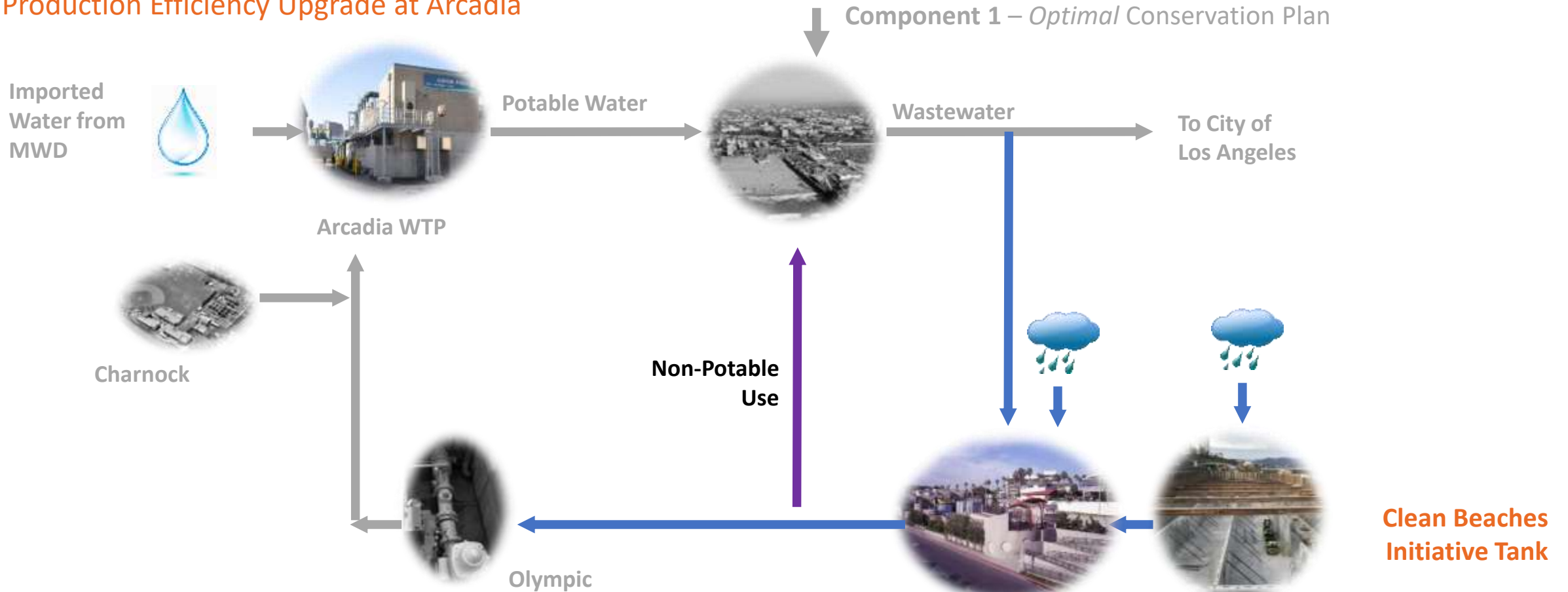


Component 1 – *Optimal Conservation Plan*



Component 2 – Alternative Water Supply

Production Efficiency Upgrade at Arcadia



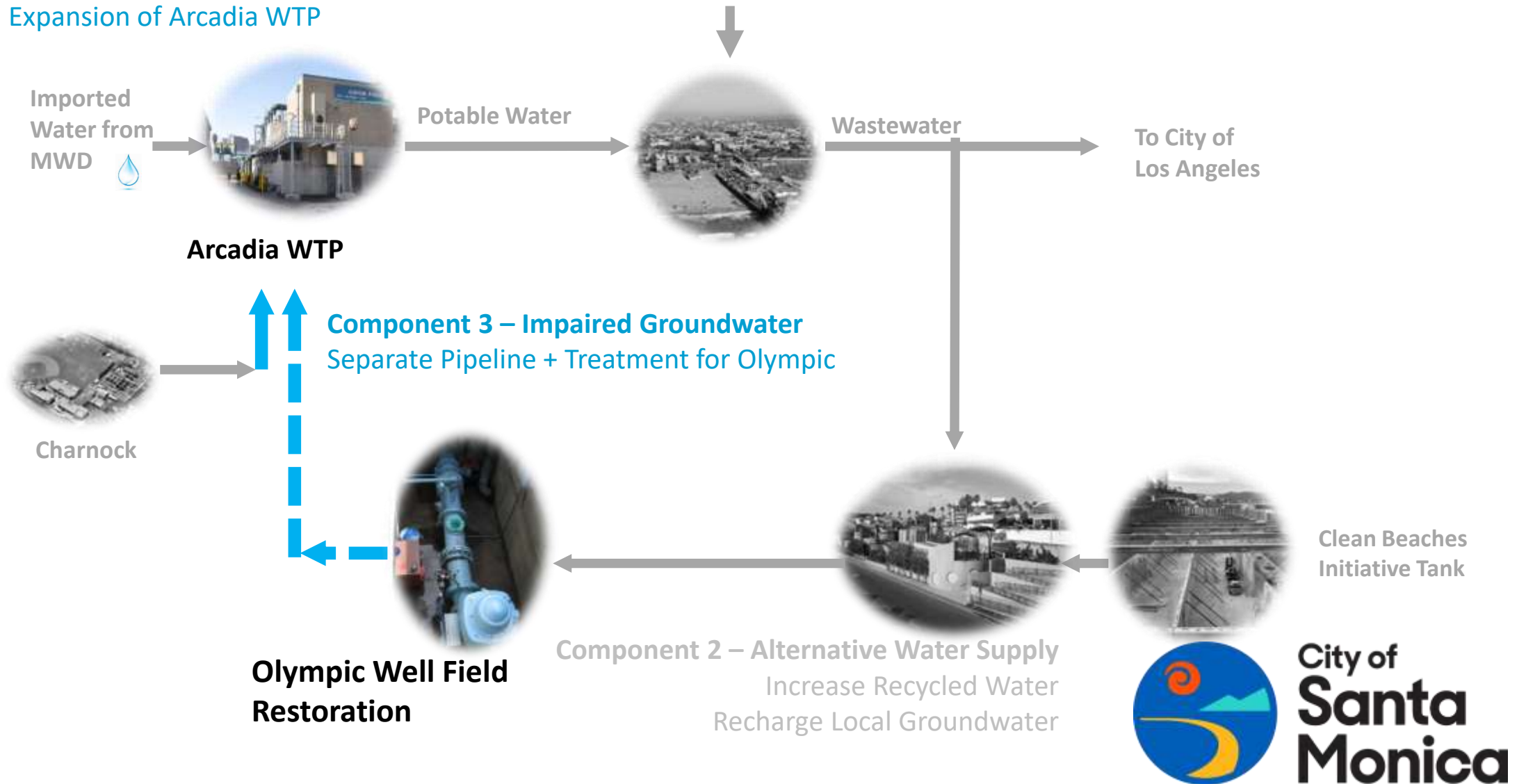
Component 2 – Alternative Water Supply

- Stormwater + Urban Runoff @ **SMURRF** for Non-Potable and Potable Reuse
- Stormwater Capture + Municipal WW @**SWIP** for Potable Reuse

Component 2 – Alternative Water Supply
Production Efficiency Upgrade at Arcadia

Component 3 – New Local Groundwater
Expansion of Arcadia WTP

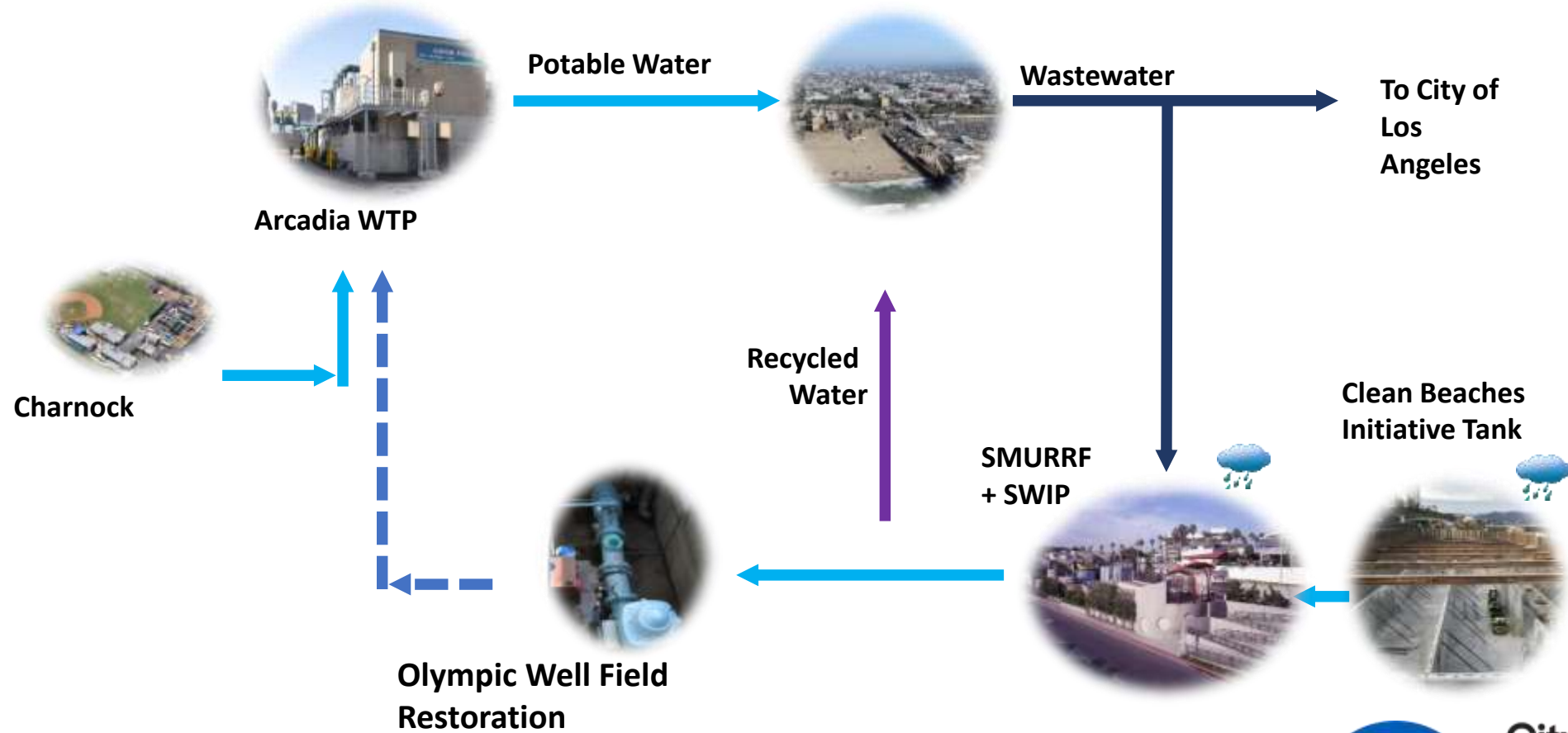
Component 1 – Optimal Conservation Plan



Component 1 – Conservation

Component 2 – Alternative Water Supply

Component 3 – New Local Groundwater





City of
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Monica**

Key Projects

Sustainable Water Infrastructure Project (SWIP)

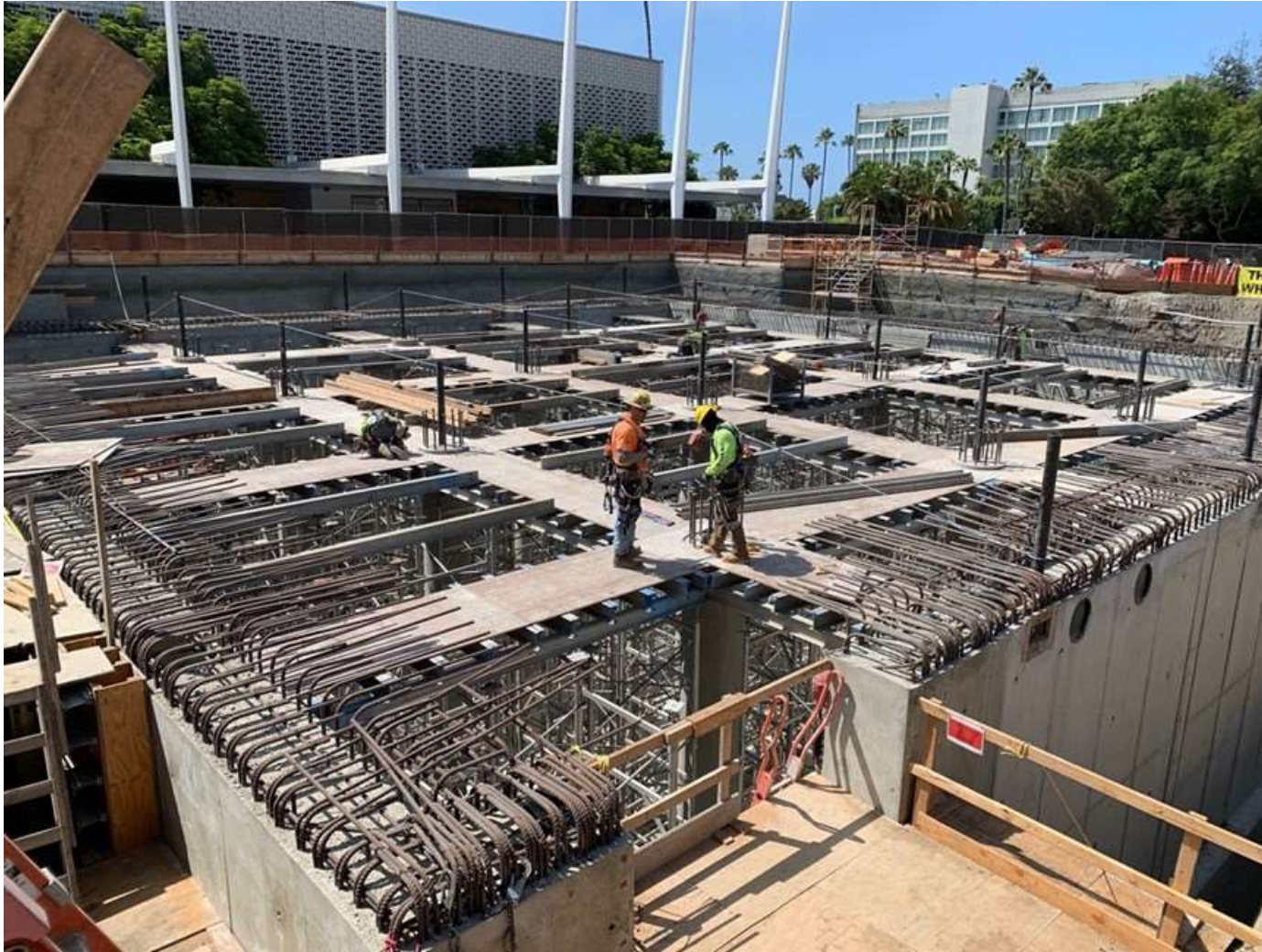


- Element 1
 - 1.5 MG Clean Beaches Tank
 - SMURRF Upgrades
- Element 2
 - New 1 MGD SWIP AWTF
 - 30/70 Blend of Stormwater and Wastewater
- Element 3
 - New 1.5 MG Stormwater capture tank

SWIP's Multiple Benefits

- Improves beach water quality
- Provides EWMP/MS4 compliance
- Drought resilient water supply
- Diversifies City's water supply portfolio
- Increases recycled water production
- Augments local groundwater supply
- Creates ~1,600 AFY of local water supply for the City

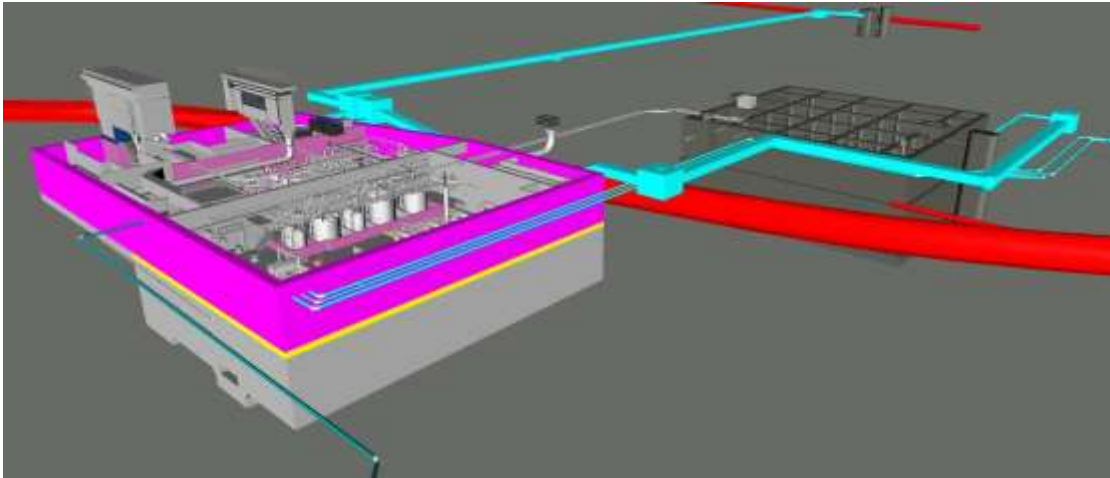
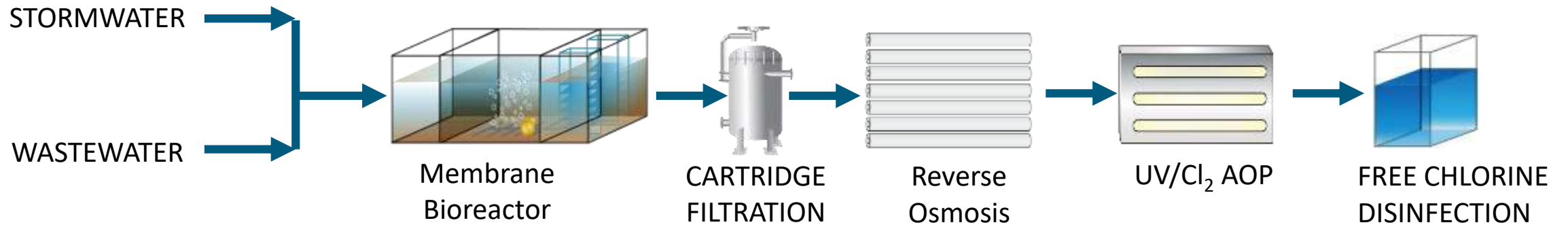
SWIP Stormwater Harvesting Tank



SWIP Advanced Water Treatment Facility

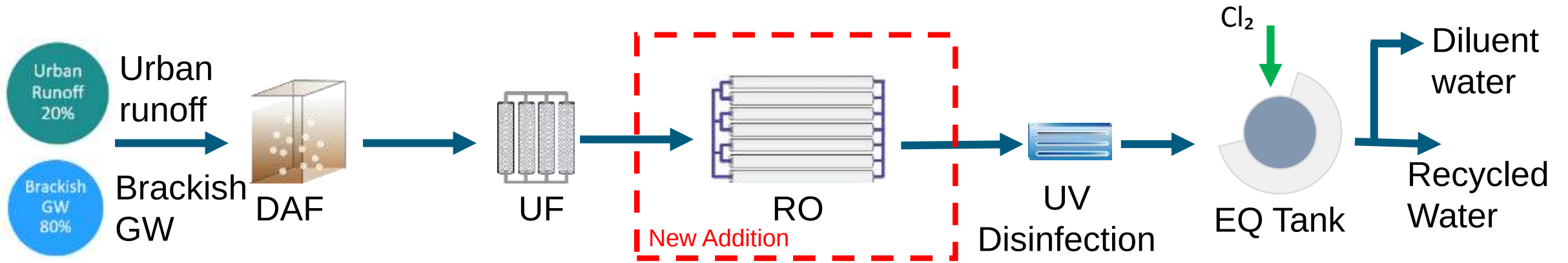


First Potable Reuse MBR in CA



- Source Water - Wastewater with up to 30% stormwater contribution when available
- Ability to meet 12-10-10 log removal for a Groundwater Replenishment Reuse Project within AWTF
- Produces up to 1,100 AFY of advanced treated recycled water

First Stormwater Direct Injection Project in CA

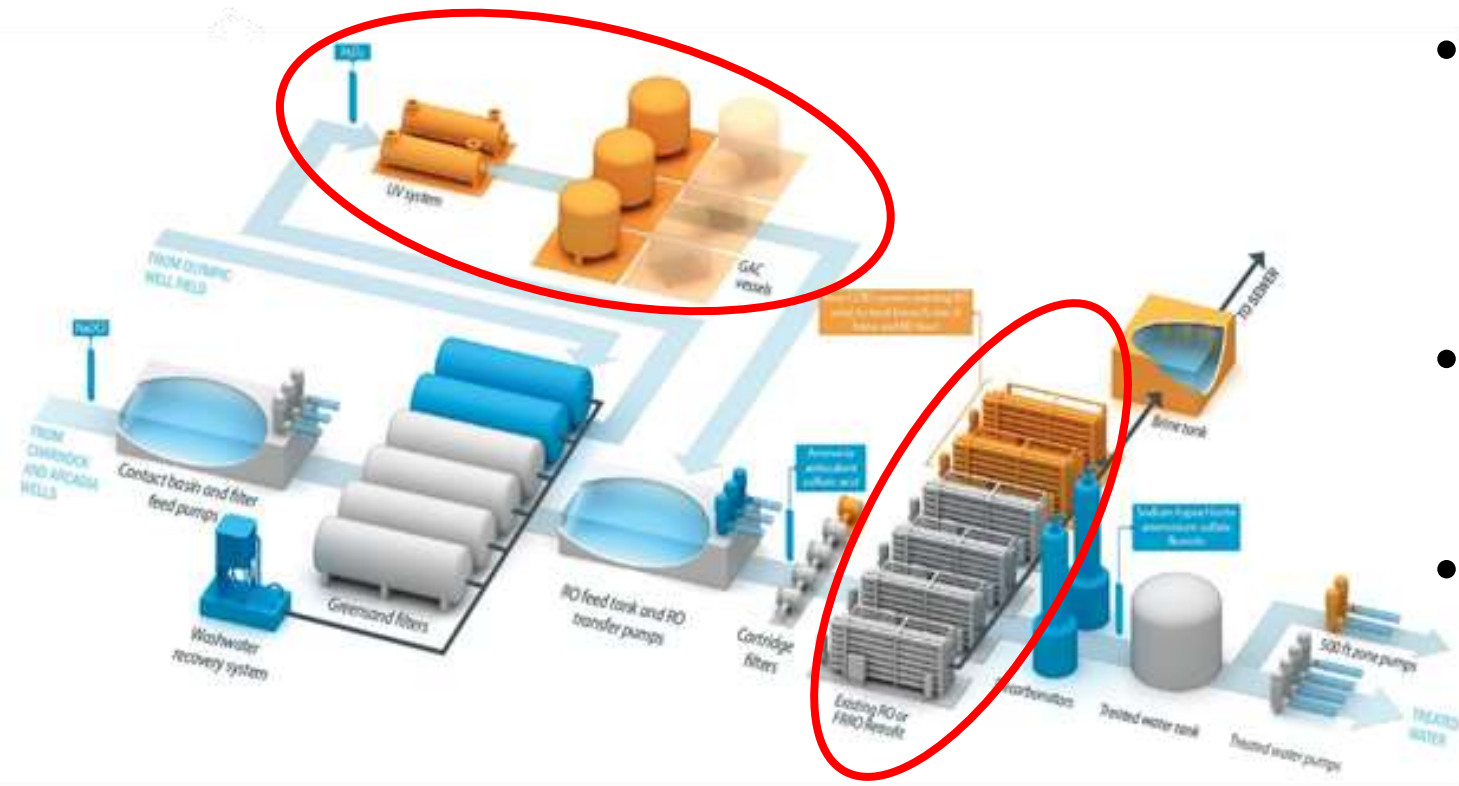


- Provides pollution control for Santa Monica Bay via stormwater diversion
- Produces Title 22 Groundwater Replenishment Reuse Project ***Diluent Water***
- Produces up to 500 AFY of diluent water



Olympic Well Field Restoration and Arcadia WTP Expansion

Key Project Elements:



- New 3 mgd UV-AOP + GAC treatment system to restore Olympic Well Field
- Expand brackish desalter from 10 to 13 mgd
- Increase RO recovery to $\geq 90\%$

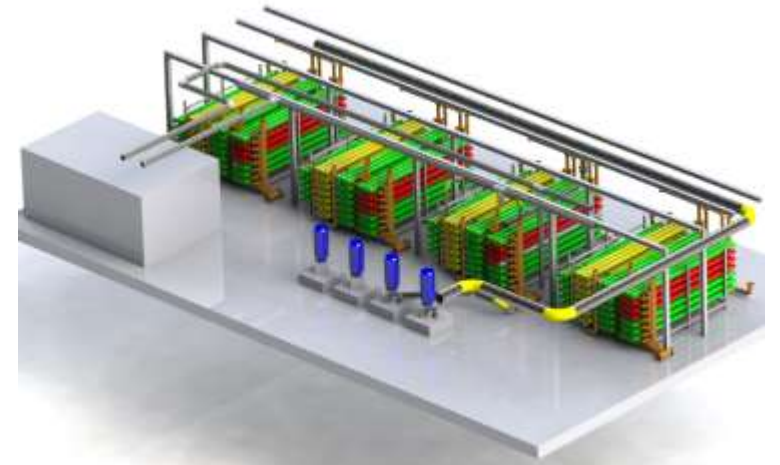
Is the Concentrate Worth the Squeeze?



Existing RO System



Closed Circuit RO (CCRO)



Flow Reversal RO (FRRO)

- Increase RO system recovery to $\geq 90\%$ to increase local water supply
- Side-by-side pilot testing of CCRO vs FRRO

First Flow Reversal RO in the United States

- Stable operations at high recovery $\geq 90\%$
- Ability to retrofit existing RO skids
- Lower operation and life-cycle cost
- Funding flexibility
- Operation flexibility
- Relatively lower risk profile

3D concept Design – Before (original design)

Front view

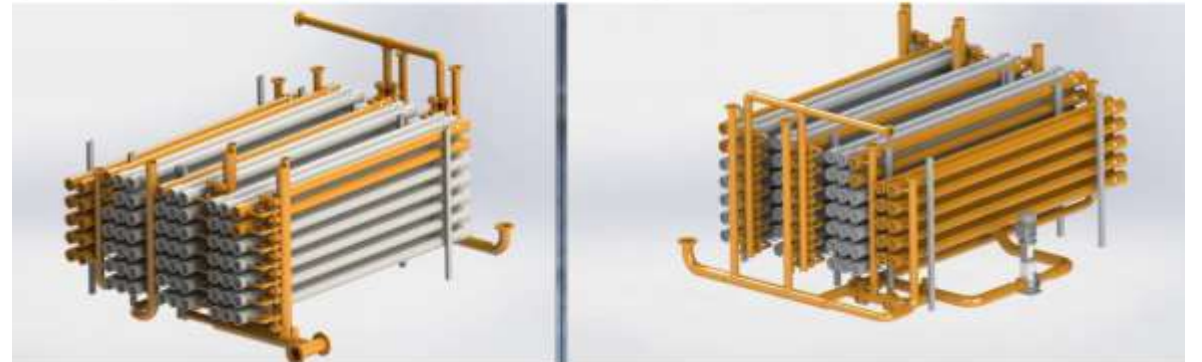
Back view



3D concept Design- After + additional parts

Front view

Back view



Funding Partners

- State Water Resources Control Board: Clean Water SRF \$75 million loan for SWIP
- Department of Water Resources: Water Desalination Grant Program - \$10 million construction grant for the Production Efficiency Enhancement at Arcadia WTP
- State Water Resources Control Board: Prop 1 Stormwater Grant - \$8.77 million for SWIP stormwater tank
- Los Angeles County: Measure W Safe Clean Water Program - \$7.5 million to support stormwater capture and treatment components of the SWIP.
- Metropolitan Water District of Southern California: Local Resources Program for \$19.6 million over 25 years for water produced by SWIP and the Production Efficiency Enhancement Project.
- Water Revenue Bond - \$78 million



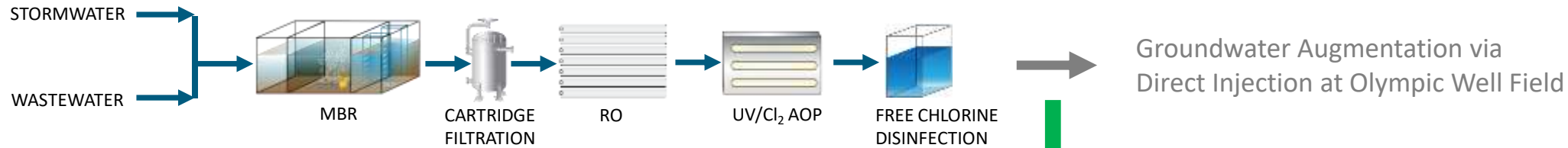
Project Partners



CALIFORNIA DEPARTMENT OF
WATER RESOURCES



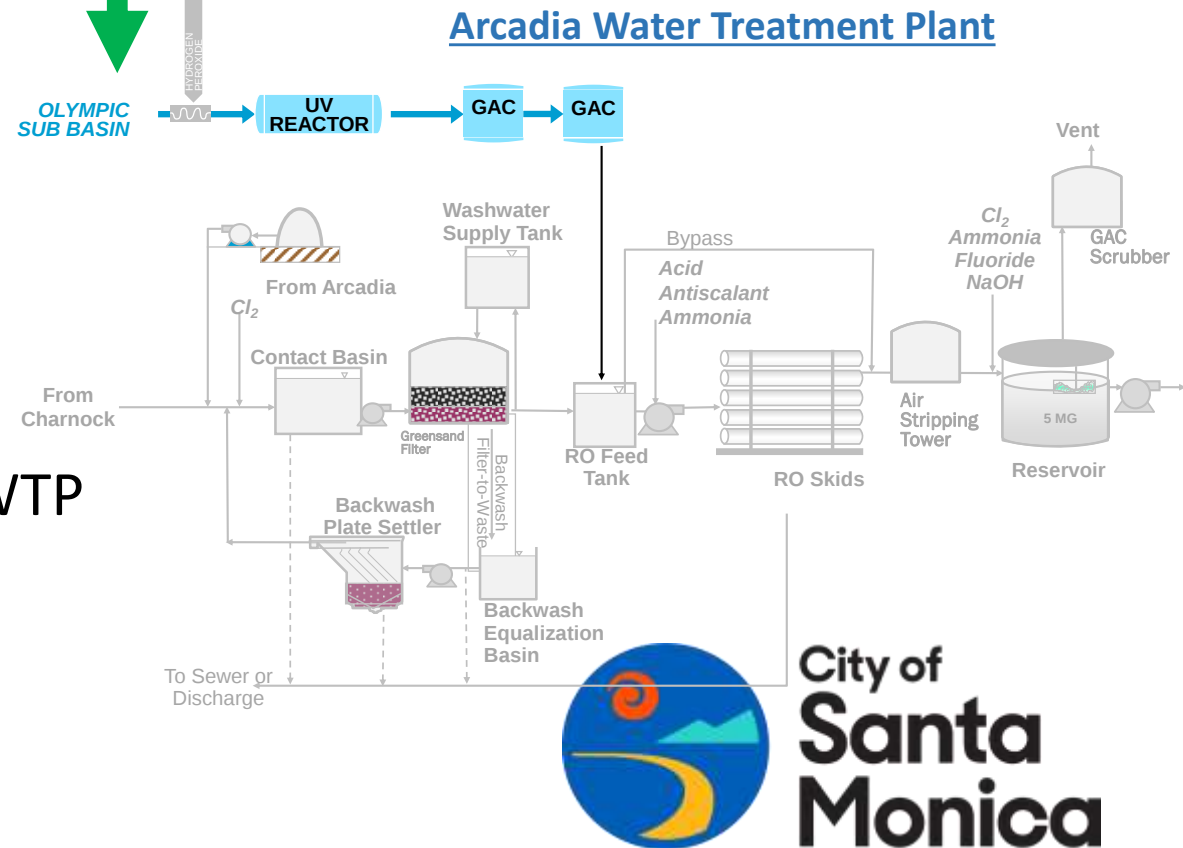
Looking to Our Future.....Direct Potable Reuse?



Sustainable Water Infrastructure Project

Future Potable Reuse – Raw Water Augmentation?

- Pending DDW guidelines in 2023
- <10% Contribution in Raw Water to Arcadia WTP
- Additional treatment through UV/H₂O₂ AOP, GAC, and RO at Arcadia WTP
- Existing Arcadia WTP is a permitted 97-005 multi-barrier treatment facility





THANK YOU...