May 2023 Water Commission Meeting
Agenda Item #13: Long-term Drought: Expert Panel on Desalination

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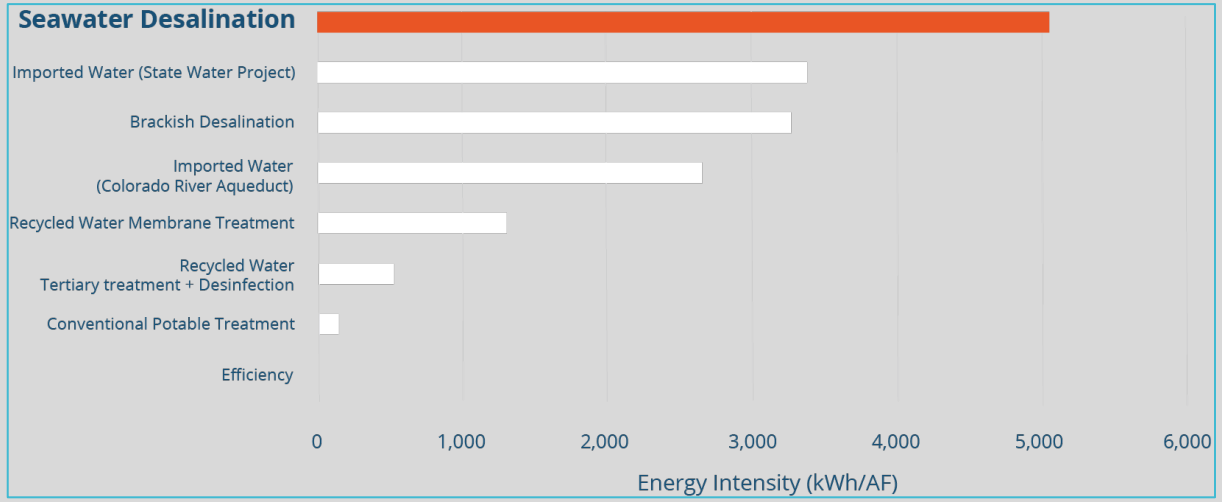
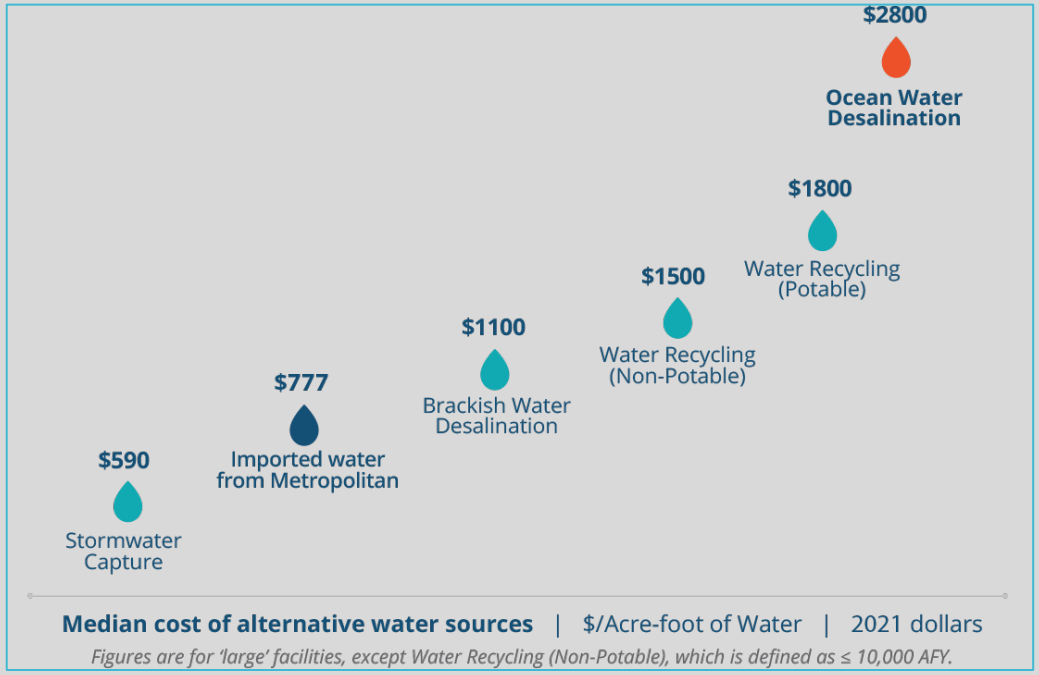
Position Statement

(1) Given the significant cost to ratepayers, high energy use and GHG emissions, and marine life impacts, ocean desalination should be considered an option of last resort.

(2) Jurisdictions should invest in ocean desalination only after they have met water efficiency targets, installed feasible stormwater capture projects, and treat *all* ocean wastewater discharges to a potable reuse standard.

(3) When ocean desalination is necessary, projects should be scaled to the actual need of the community, utilize subsurface intakes to minimize marine life mortality, and site their discharge appropriately to avoid MPAs or cause toxic dead zones.

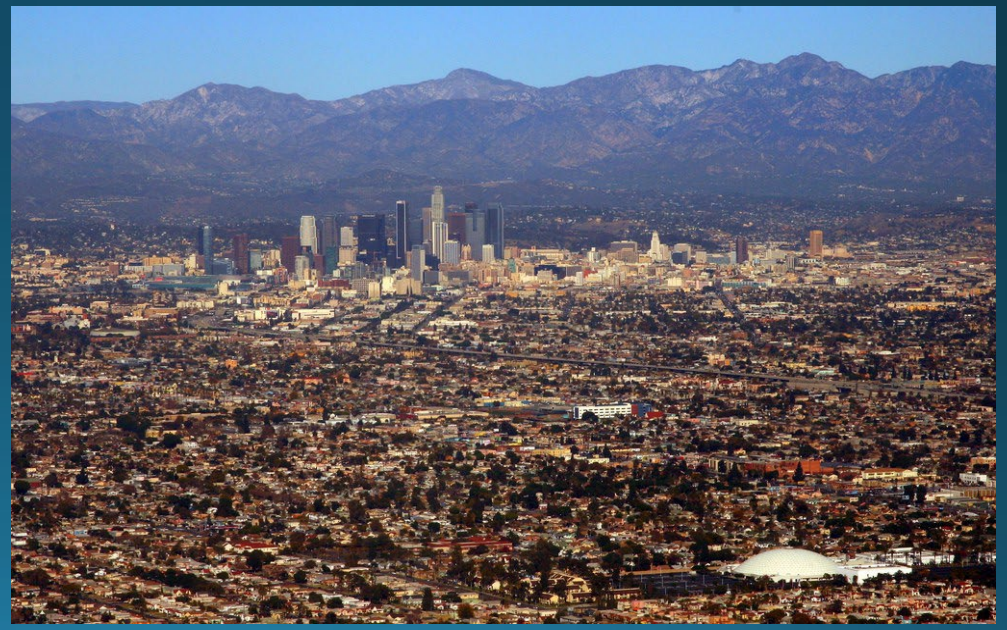




Why Should Ocean Desalination Be An Option of Last Resort?

California is Not Israel

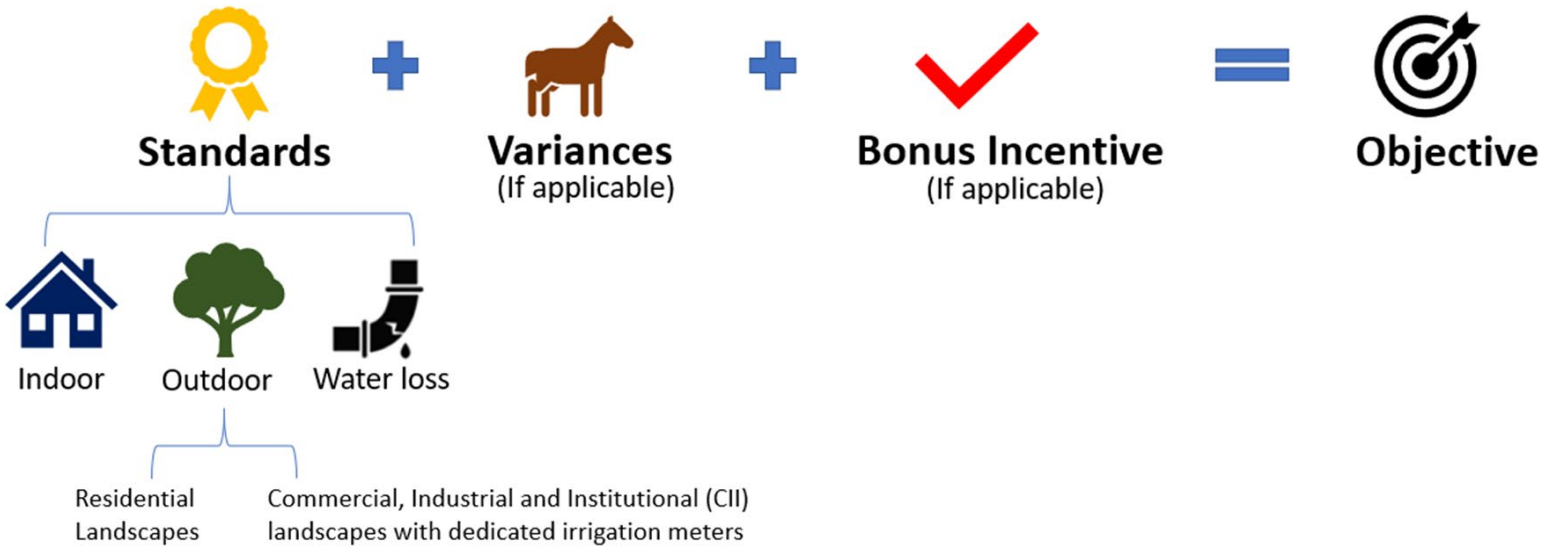
Israel	California
Household Water Use: 44 GPCD	California Household Water Use: 75 GPCD
Reuse of Wastewater: 94%	Reuse of Wastewater: 13%
Water for Ag: 1.6 acre-feet per acre of land	Water for Ag: 3 acre-feet per acre of land



Demand Risk – A Cautionary Tale

‘Making Conservation a Way of Life’

Potential: Efficient technologies and practices could reduce California’s urban water use by 2.0 million to 3.1 million AFY, or by 30% to 48%.



Stormwater Capture

- Urban stormwater capture could boost water supplies by 580,000 AF in a dry year to 3.0 million AF in a wet year.
- Clean Water Act Permits incentivize capture
- New Commercial, Industrial, Institutional (CII) Stormwater Permit in Los Angeles
- AB 2106 (R. Rivas – 2022) – Statewide CII Permit – Vetoed
- Statewide Credit Trading Programs
- Need Proposition 218 Reform

Potable Reuse

- Potential
  - Statewide: 2.6 Million AFY effluent discharged and not recycled (**1.7 million AFY of wastewater is discharged to the ocean**). *Regions 2 and 4 are largely responsible for the ocean discharges.*
  - MET's Carson Project = 168,000 acre-feet
  - LA's Operation Next at Hyperion = 243,000 acre-feet
- Groundwater and surface water recycling replenishment regulations NOW exist
- AB 574 – Direct Potable Reuse Regulations by 2023
- Ocean Wastewater Discharges Should be the State's Priority (State's Ocean Strategic Plan sets a goal to recycle all ocean wastewater)

State's Ocean Plan – Desalination Amendment

I. Water Code 13142.5(b) Analysis:
   (1) Independent Assessment of Best Available Technology, Design, Site, and Mitigation
   (2) Assessment of the Best Combination of Each Independent Factor

II. Water Code13142.5(b) Elements

- Best Available Technology - **Subsurface Feasibility**. Subsurface intakes are required unless a Regional Water Board determines their use is infeasible after a comparative analysis.
- Best Available Design - includes **intake capacity**. This means a Regional Water Board must consider a reasonable range of alternative sizes to minimize marine life mortality.
- Best Available Site - The Regional Water Board is required to evaluate a **reasonable range of sites that would support subsurface intakes**.
- Best Available Mitigation - Mitigation projects shall be accomplished through the **expansion, restoration, or creation** of restoration projects will **fully mitigate** for intake and mortality associated with the facility.

Design the Intake Capacity to Match the Community's Need

As defined in the Desalination Amendment, "design" is the size, layout, form, and function of a facility, including the ***intake capacity*** and the configuration and type of infrastructure, including intake and outfall structures.

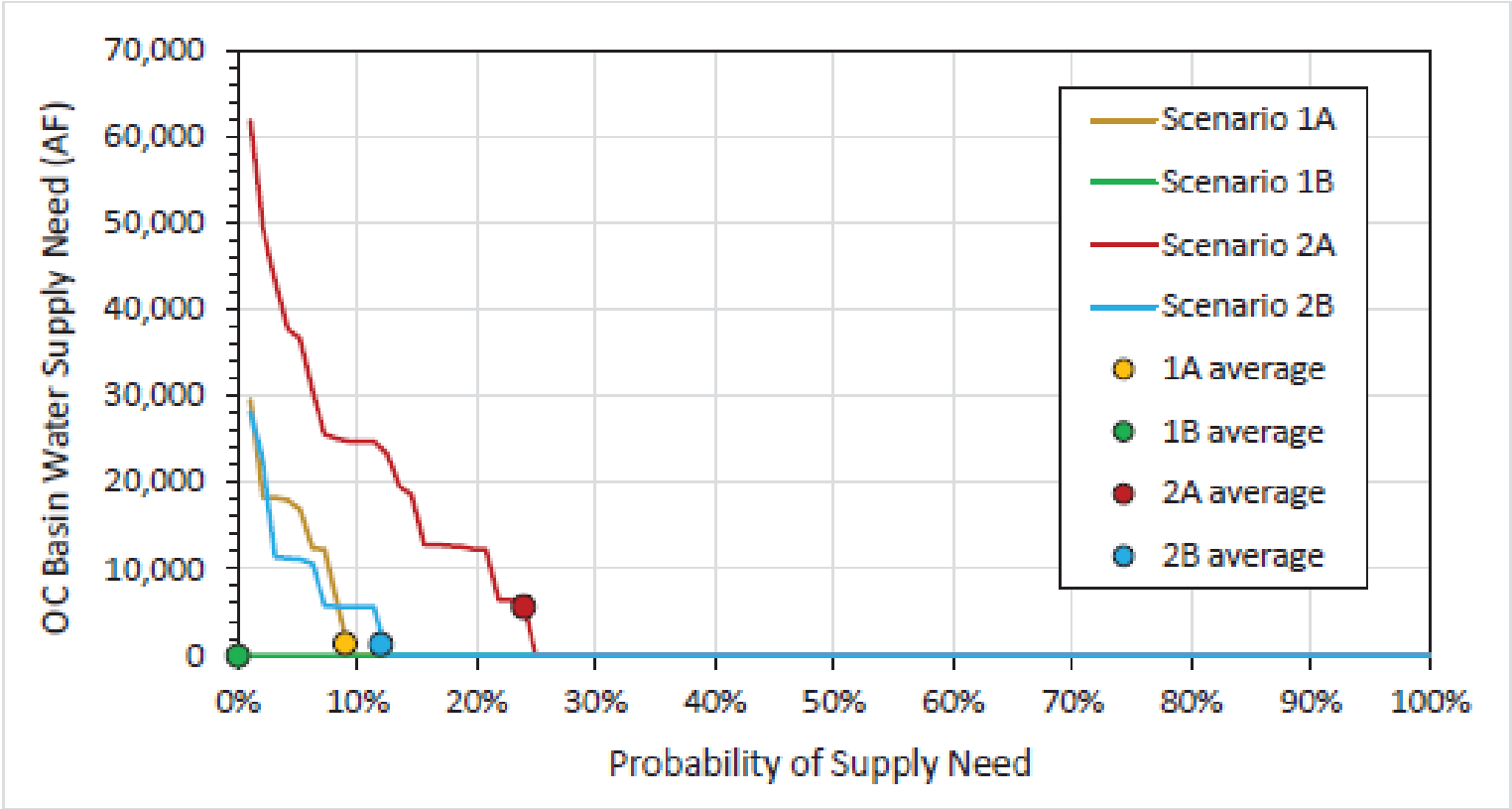
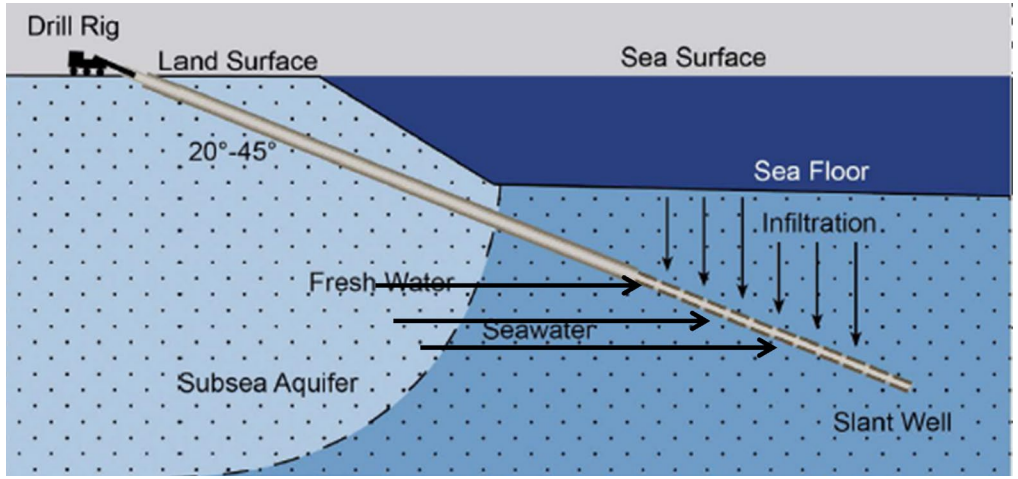
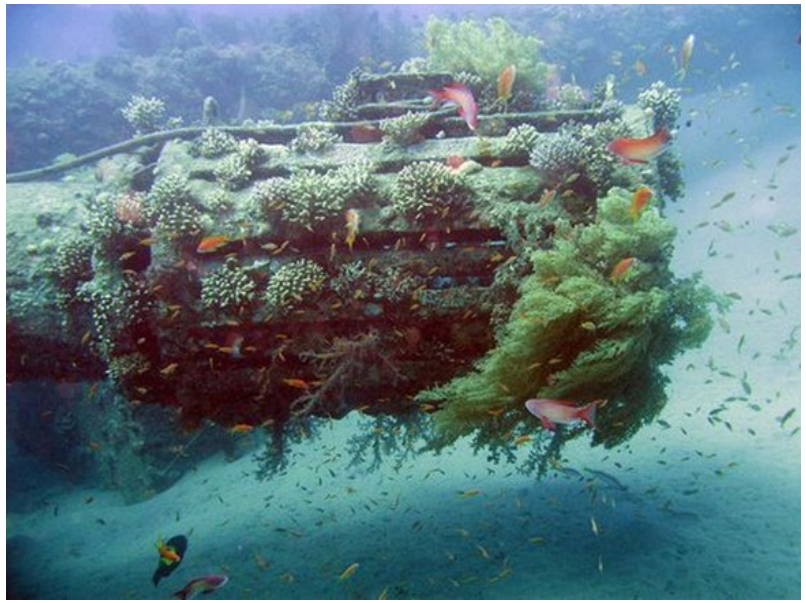


Figure 4-5. Projected Water Supply Need for OC Basin in Year 2040



Install Subsurface Intakes

- Are Proven Feasible
- Eliminate Operational Marine Life Mortality
- Eliminate Pretreatment Needs: More Cost-Effective through the Life of the Project & Less Energy Intensive
- Subsurface Intakes will Streamline and Expedite the Permitting Process



1MM Screens Do Not Work

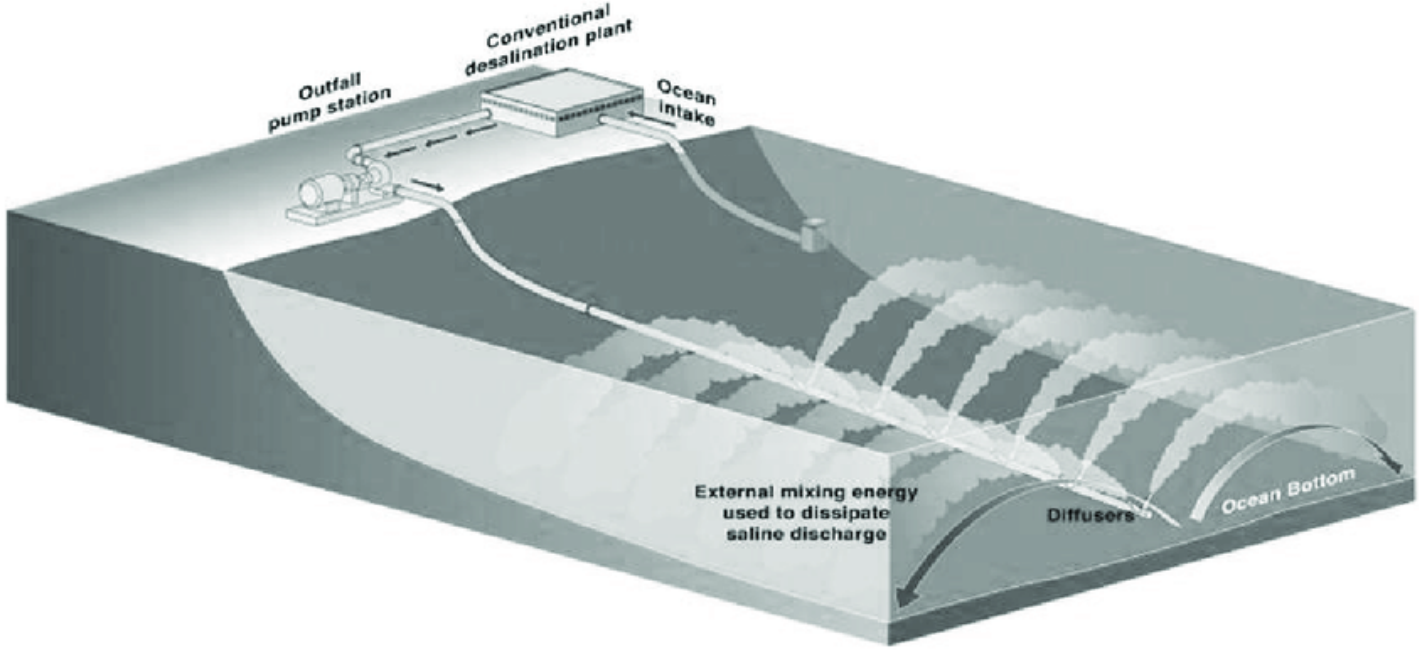
Screened intakes result in **ONLY a 1% reduction of entrainment**

In California, “data for two of the most prevalent larva in California waters showed that all northern anchovy larva less than 8 mm in length (74.5% of the population) and all CIQ gobies less than 6 mm (92.2% of the population) would be entrained using a 1 mm wedgewire screen.”

Expert Panel on Intakes Conclusion: “intake screens reduce entrainment of all organisms present in seawater by no more than one percent.”

Brine Impacts

- Impacts to Marine Life:
  - Benthic marine life can "have increased exposure to the brine and other potentially toxic constituents, which may have deleterious effects."
  - "Lab and field studies have shown the potential for acute and chronic toxicity and small-scale alterations to community structure after being exposed to concentrations of brine near discharge sites."
- Preferred Brine Technology – the preferred method for disposing of brine is to comingle it with treated wastewater.
- High-Pressure Diffusers – are the next best method for discharging brine when treated wastewater is not available.
- Flow Augmentation – is illegal for all facilities using an open-ocean intake except Carlsbad.



What To Do About the Brine Discharge?

- Dilute with wastewater discharges – What about water recycling goals?
- Spray Brine Diffusers – Increases marine life mortality
- Need to site away from protected areas
- Need to ensure proper mitigation of unavoidable impacts

A Tale of Two Projects

Poseidon – Huntington Beach

Vs.

Doheny

Poseidon – Huntington Beach

Poseidon requested to operate the SAME PROJECT PROPOSED 20 YEARS AGO despite the adoption of the OTC Policy and the Desalination Amendment.

- Exact same OTC intake pipe
- Exact same Poseidon-determined co-located facility
- Exact same Poseidon-determined design capacity
- Exact same Poseidon-determined production capacity despite change in demand/need

- "Need for additional water supplies is fairly small (and) OCWD has a number of pending projects that would provide significant supplies to meet the remaining gaps."
- Poseidon Huntington Beach was the "least cost effective" of the alternatives reviewed.
- The Poseidon Huntington Beach project poses the most significant financial risk of the alternatives studied.
- According to the Santa Ana Regional Water Board, the project would kill 108 million small ocean animals each year.
- The project would discharge more than 18 billion gallons of toxic wastewater into the ocean each year.

Scenario	2030 Max Supply Need (AFY)	2040 Max Supply Need (AFY)	2050 Max Supply Need (AFY)	Max Supply Need Over Entire Period (AFY)	Assumed 10% Demand Curtailment (AFY)	Remaining Supply Need (AFY)
1 A) Minimal Climate Impacts with Low-Cost MET Investments	56,000	35,000	41,000	56,000	40,000	16,000
1 B) Minimal Climate Impacts with High-Cost MET Investments	22,000	0	5,000	22,000	40,000	0
2 A) Significant Climate Impacts with Low-Cost MET Investments	62,000	62,000	62,000	62,000	40,000	22,000
2 B) Significant Climate Impacts with High-Cost MET Investments	56,000	28,000	39,000	56,000	40,000	16,000
					Average of Four Scenarios	**13,500**
					Range of Four Scenarios after Demand Curtailment: 0 to 22,000 AFY	

Poseidon – HB: 56,000 AFY

Doheny Project

The Doheny desalination project should set the precedent for desalination plants in California.

In 2022, the project received unanimous votes for a Coastal Development Permit from the California Coastal Commission and a General Land Lease from the California State Lands Commission.

Before construction, South Coast Water District must consult with local tribes, find solutions to decrease the financial impact on low-income ratepayers, and create a clear plan to reduce the potentially large greenhouse gas emissions from the plant.

The Future?

Was Poseidon the death knell for ocean desalination in California?

- ✓ Smaller facilities with subsurface intakes
- ✓ Direct Potable Reuse will dominate
- ✓ Brackish desalination a preferred investment

Existing and Planned Potable Reuse Projects

- Permitted Groundwater Augmentation
  207,545 AFY
- Planned Groundwater Augmentation
  388,764 AFY
- Planned Reservoir Water Augmentation
  119,031 AFY
- Planned Raw Water Augmentation
  32,000 AFY

Total Existing and Planned Permitted Use
747,340 AFY

Information from WRCA 2019 survey

Conclusion

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