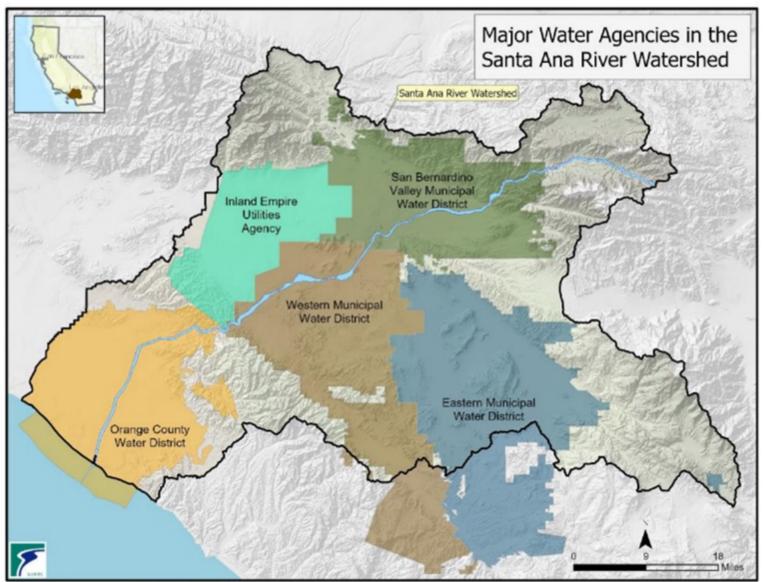


Inland Empire Brine Line

Jeff Mosher
General Manager
Santa Ana Watershed Project Authority

2-24 Annual Salinity Summit Multi-State Salinity Coalition February 29, 2023

SAWPA Member Agencies





SAWPA Activities

- Inland Empire Brine Line
- One Water One Watershed (OWOW) Program
- Regional Roundtables and Task Forces

2

Inland Empire Brine Line

- 73 miles (~\$400M value)
 - Plus ~60 miles of laterals
 - Plus ~20 miles in OC
- ~14 MGD Flow (30 MGD capacity)
- Direct dischargers
- Indirect (trucked disposal)
- Brine and high saline wastewater
 - Desalters (~70% of flows)
 - Industrial/Commercial/WW RO
- Salinity is ~6,000 TDS
- Removes 500,000 lbs/day of salt
- OC San Partner
 - Conveyance
 - Treatment (segregated train)
 - Ocean discharge





Benefits of Inland Empire Brine Line

Purpose

- Provide public agencies and commercial industries with a cost-effective salinity management option
- Allows for salt removal from the watershed
- Help achieve long-term, watershed-wide salinity balance

WWTP Benefits

 Disposal of emergency wastewater discharges from local WWTPs (avoids non-compliant discharges to the environment)

Water Supply Benefits

- Supports the use of groundwater desalters (brine disposal)
- Protects the Santa Ana River and groundwater basins

Recycled Water Benefits

- Supports the use of recycled water projects
- Keeps industrial effluent with high salinity out of wastewater collection systems

List of Desalters

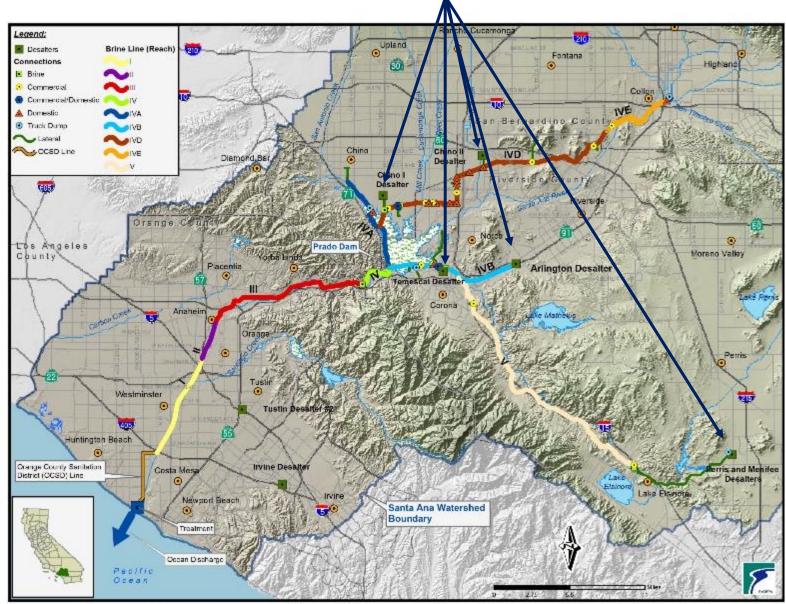
Desalter (Owner/Operator)

- Arlington (WMWD)
- Chino I (CDA / IEUA)
- Chino II (CDA / JCSD)
- Menifee (EMWD)
- Perris (EMWD)
- Perris II (New) (EMWD)
- Temescal (Corona)

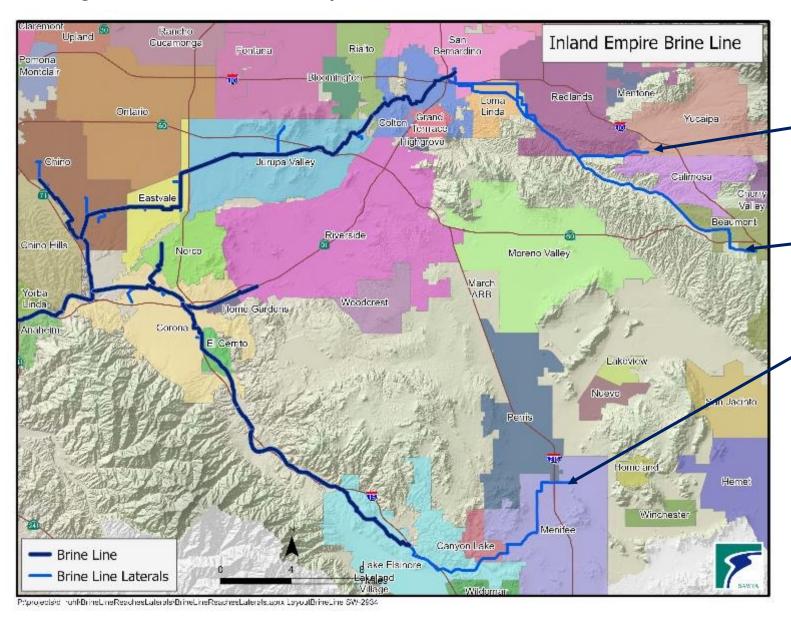
Capacity of Desalters

• 50 MGD

Desalters (brine discharges)



Major "laterals" (extensions to the Brine Line)

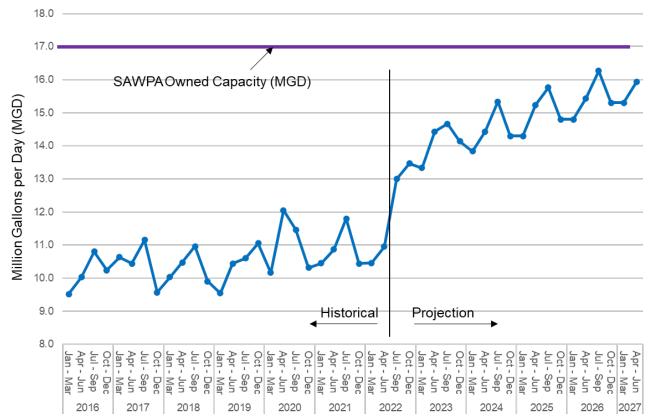


- Wastewater RO Concentrate Dischargers
 - Yucaipa Valley Water District Henry Wochholz Regional Water Recycling Facility (~13 miles)
 - City of Beaumont Wastewater Treatment Plant (~24 miles)
- Menifee and Perris Desalters (~20 miles)

Brine Line Flows and Costs

SAWPA Flow to OC San SARI Metering Station

Historical Quarterly Average (2016 - July 2022) Quarterly Average Projections (August 2022 – June 2027)



- Costs of disposal based on:
 - Treatment
 - Volume discharged
 - Pounds of BOD
 - Pounds TSS
 - Fixed pipeline capacity charges
 - But not TDS!
- \$170 per 100,000 gal based on 5 BOD and 5 TSS

Brine Line – Current Activities

Brine Line Master Plan (in progress)

- Long-term planning document that addresses facility needs
 - Serve the watershed, Member Agencies, and BL dischargers
- System Evaluation
 - Focus resources and prioritize projects (in reaching 30 MGD capacity)
 - Maintain system reliability (operations)
 - Accommodate future growth
 - Meet future regulatory requirements
- Opportunities
 - Enhanced resiliency (emergencies, climate, etc.)
 - Included in revised Reserve Policy (2022)
 - Brine concentration facilities
 - Centralized or regional
 - Investigate treatment opportunities
 - BOD and/or TSS



Brine Line – Challenges and Opportunities

Scale Formation



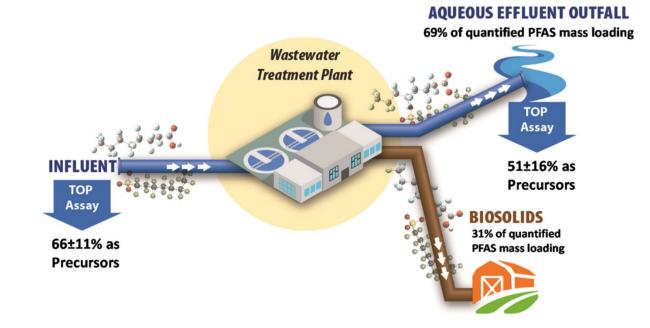






PFAS in Brine Flows

- OC San is our partner on brine treatment and discharge
- 2021 Sampling Study
 - 6 monthly sampling events
 - 38 chemicals
- Findings
 - 10 chemicals found in <u>all</u> samples



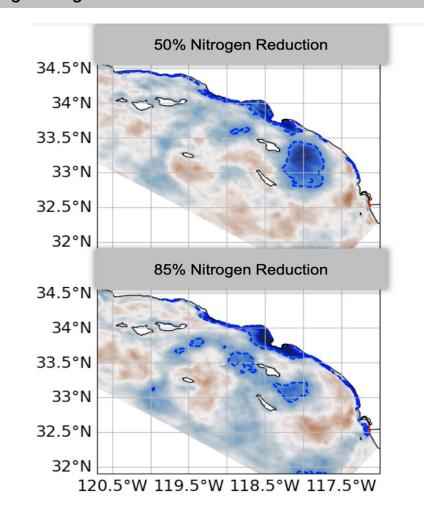
Source: Schaefer et al. (2023) Occurrence of quantifiable and semiquantifiable PFAS in united states wastewater treatment plants

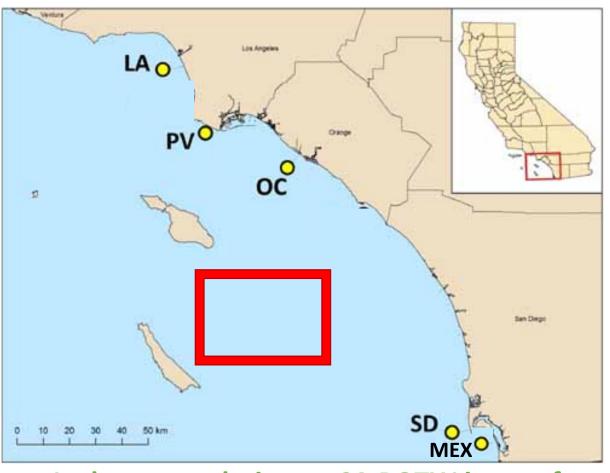
Chemical	Average (ng/L)	Maximum (ng/L)	Wastewater (Avg ng/L) (Schaefer et al., 2023)
PFOA	106	130	8-69
PFOS	136	170	7-83
Other 8 chemicals	6-81	7-90	

Nutrients in Ocean Outfalls: Assessing Ocean Acidification and Hypoxia (OAH) Impairments Using ROMS-BEC (SCCWRP Study)



Change in Algal Production from OCEAN+ LAND-BASED Scenario

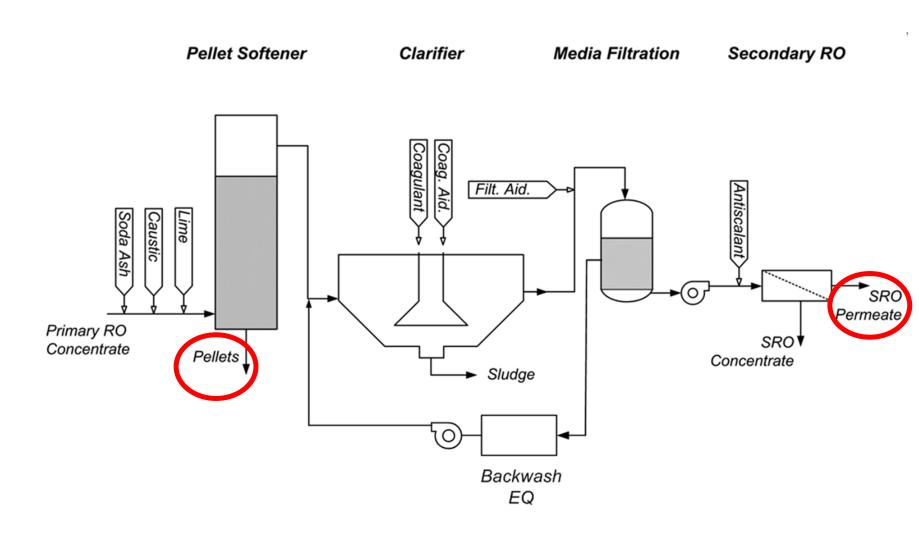




Is there correlation to CA POTW inputs for predicted offshore impacts?

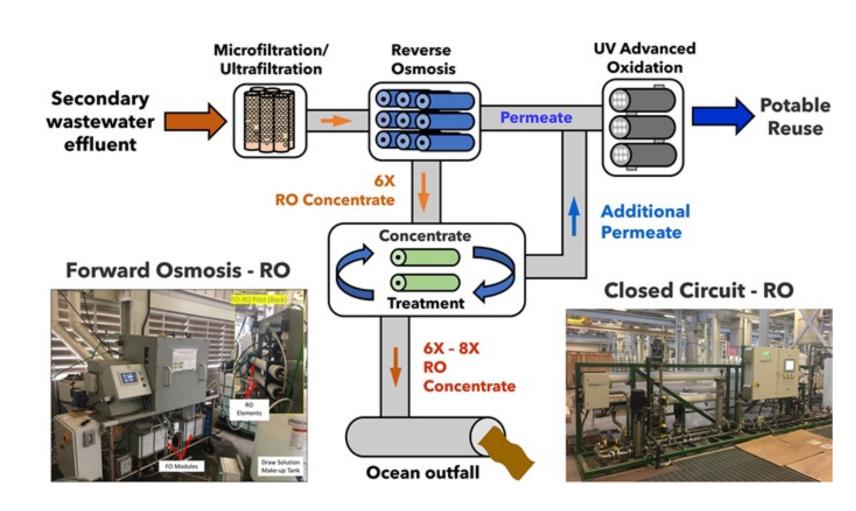
Concentrate Treatment

- Chino Basin
 Desalter Authority
- Concentrate
 Reduction Facility
 (CDF)
- Purpose:
 - Reduces scale
 - Water supply
 - Reduces brine flow
 - Beneficial byproduct (pellets)



Concentrate Treatment Studies in Watershed

- EMWD
 - Brine Concentration
 Pilot Project
 - Closed Circuit Reverse Osmosis (CCRO)
- OCWD
 - CCRO
 - Forward Osmosis



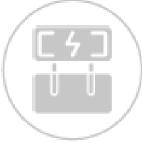
Clean Hydrogen (for train locomotives and trucks) "Angeles Link" – SoCal Gas Feasibility Study



25-35 GW Curtalled/New/Solar/Wind 2 GW Batterles

Start with 100%

renewable electricity
that is on the grid,
new build, or being
curtailed to
provide power to
the electrolyzer.



10-20 GW Electrolyzers

Then use it to make

clean, renewable
hydrogen
with electrolyzers.
Electrolysis splits water
into hydrogen and
oxygen with virtually
zero greenhouse gas
and criteria
pollutant emissions.



Mileage of hydrogen infrastructure is preliminary at this time and will be addressed in study.

SoCalGas safely delivers hydrogen from outside of the LA Basin to Industries that need it most.



14.3 million tons of CO₂ emissions eliminated

Use clean, renewable hydrogen to decarbonize hard-to-electrify sectors such as dispatchable electric generation, heavy-duty transportation and industrial processes while driving job creation.



Thank you!