



# Brackish Water Desalination Project





# Agenda

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- Project background and objectives
- Project overview
- Accomplishments to date
- Funding
- Schedule



## City water supply

- The City pumps, treats and distributes raw water from the San Joaquin River utilizing its pre-1914 water rights.
- The City purchases water from Contra Costa Water District when salinity is too high at its river intake.



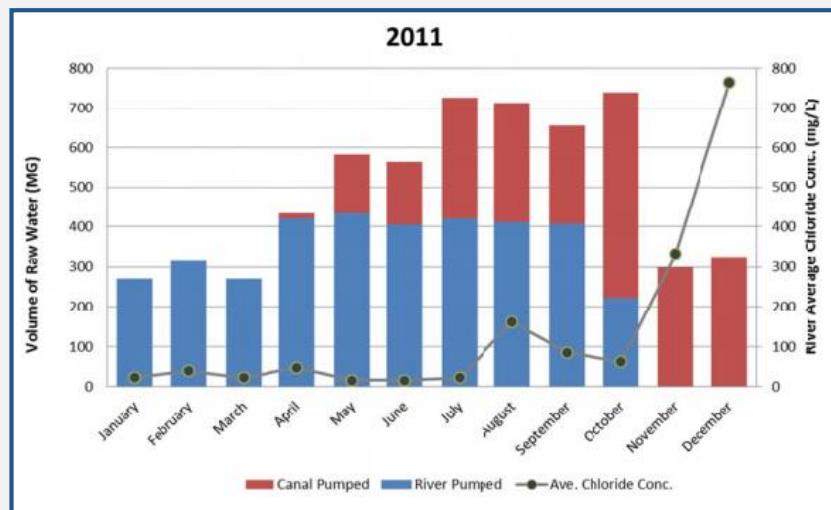


# Value of City's water rights is being eroded

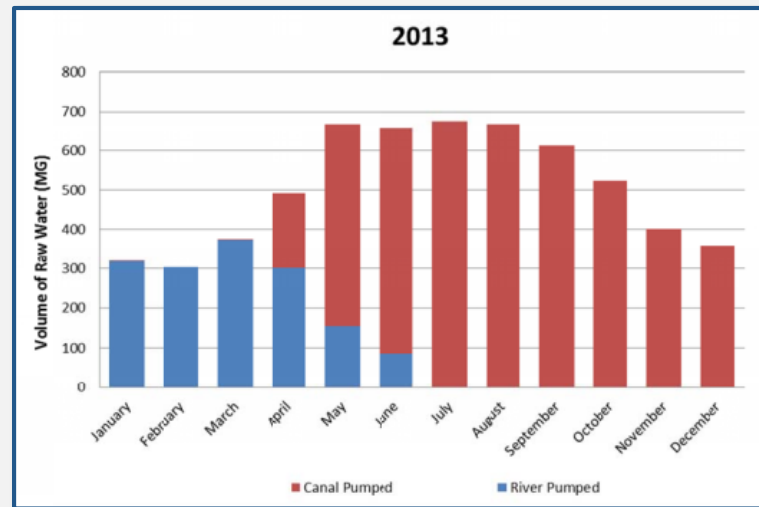
- Estimated value of City water rights: \$70-\$100M
- Changes in Delta water management: WaterFix
- Cumulative impacts of other projects degrading water quality in Western Delta
  - CCWD settlement on WaterFix
  - Freeport
  - Development in San Joaquin Valley, etc.
- Climate change: Increasing frequency of droughts



# Increasing salinity in Western Delta forces City to stop using the river earlier in year



- In typical non-drought years, 40% of the City's supply comes from the San Joaquin River



- In drought years, the City must switch to CCWD supply earlier
- As little as 25% of the City's supply may come from the San Joaquin River



## 5 years ago the City began investigating brackish water project opportunities

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- California in the middle of a 5 year drought
- Protect water quality and reliability against droughts
- Restore and maintain the value of the City's water rights
- City needed to find ways to mitigate for WaterFix



# Brackish water desalination is cost-effective

- Tidal Delta water ~50 times less salty than seawater
- One third the cost of seawater desalination
- Current cost of Antioch finished water
  - \$1600/AF (CCWD raw water charge + treatment costs)
- Estimated water cost brackish water facility
  - \$1,200/AF to \$1,500/AF (including amortized capital costs)



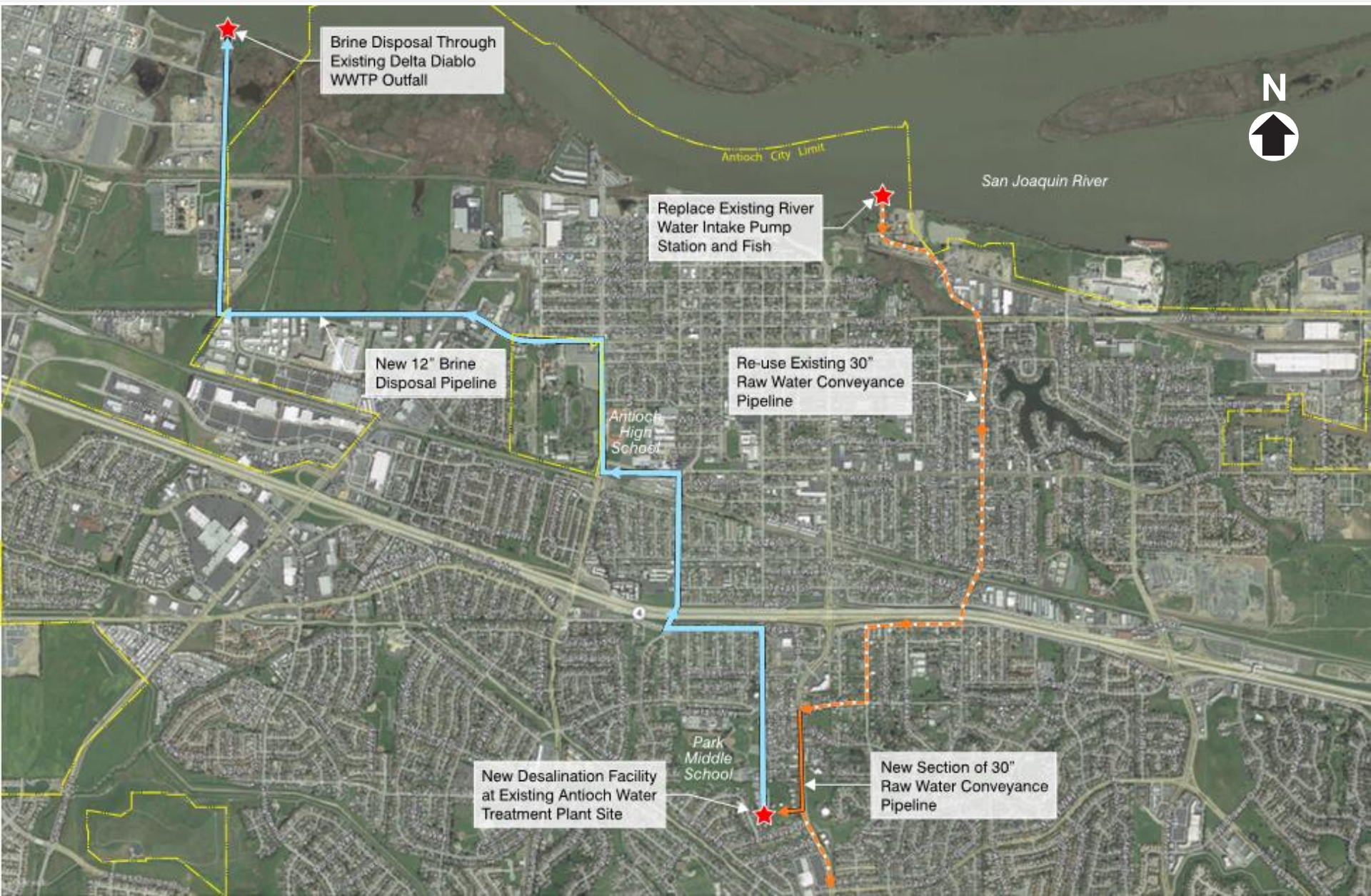


# Project overview

- Treat 8 MGD of brackish water to produce 6 MGD finished water
  - Could be as much as 16 MGD for a regional plant
- New river intake with state-of-the-art fish screens (incorporates existing CIP project)
- Desalination facility at existing Antioch WTP site
- Discharge brine at Delta Diablo existing outfall



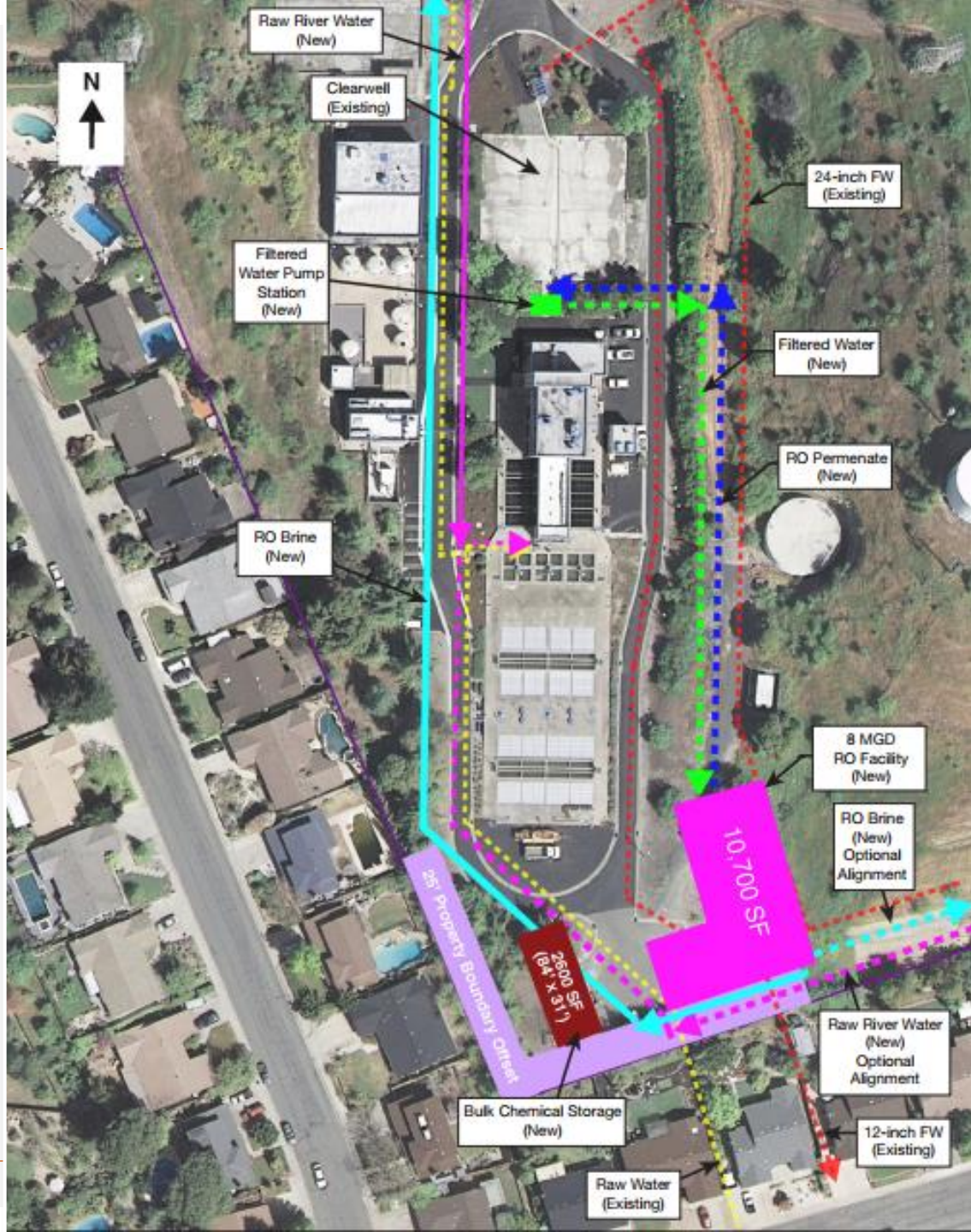
# Brackish Water Project makes cost-effective use of existing facilities







# Conceptual site plan at Antioch WTP





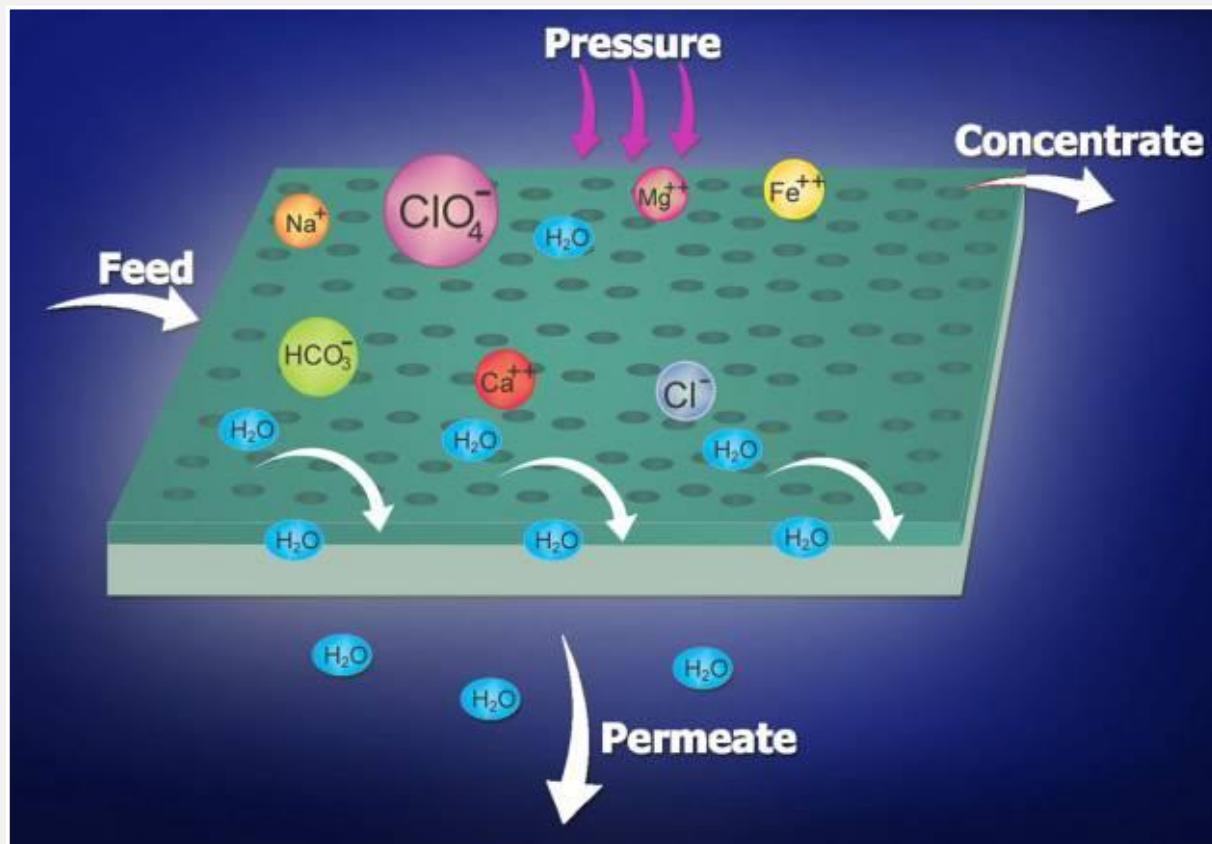
**Desalination facility utilizes reverse osmosis membranes that are housed inside pressure vessels supported on racks**







# Pressure is applied to water passing through the RO membranes to “filter out” salts



- Produces high-quality finished water called permeate
- (Brine) stream is discharged to the wastewater plant



## Environmental and economic benefits

- Improvements at the City's intake would reduce its impact on the river
- State-of-the-art fish screens and variable speed pumping provide net environmental fish benefits
- New pumps will allow operational flexibility/efficiency in the timing and rate at which water is diverted
- The more reliable a community's water supply, the better the prospects for industrial and commercial growth (jobs)



# Accomplishments to date

- Received \$1M in State financing for planning effort
- Completed EIR
- Awarded \$10M grant from DWR
  - Funding Agreement underway
- Submitted \$53M State low-interest loan application
  - Approval pending
- Developed project concepts and budgets
- Evaluated alternative ways to deliver project
- Continuing to pursue outside funding



# Project schedule

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- Complete preliminary design and permitting in late 2019
- Secure low-interest loan and select design-build team in early 2020
- Project online in early 2022





## Project website

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Visit the Antioch Brackish Water Desal Project website for additional information and project updates.

<http://www.antiochbrackishdesal.com/>