



## STAFF REPORT TO THE CITY COUNCIL

**DATE:** Regular Meeting of December 12, 2017

**TO:** Honorable Mayor and Members of the City Council

**SUBMITTED BY:** Scott Buenting, Project Manager *SB*

**APPROVED BY:** Lynne B. Filson, Assistant City Engineer II *LBF*

**SUBJECT:** Update on the Brackish Water Desalination Project (P.W. 694)

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### **RECOMMENDED ACTION**

It is recommended that the City Council receive and file.

### **STRATEGIC PURPOSE**

This item supports Strategy K-1 in the Strategic Plan by ensuring well maintained public facilities and Strategy K-2 by delivering high quality water to our customers. By investigating and pursuing alternative potable water sources, especially in times of severe drought and to improve treated water reliability, this project is an important part of maintaining a highly functioning and reliable water system.

### **FISCAL IMPACT**

The total cost of environmental certification, design and construction of this project is estimated to be \$60,000,000. The City has obtained a \$1,000,000 low interest planning loan from the State Water Resources Control Board (SWRCB) Drinking Water State Revolving Fund (SRF) Loan program for planning and preliminary design activities. Design and construction of this project is currently unfunded, however the City continues to seek funding opportunities through various sources including local funds, grants, loans or bonds. Staff has met with SWRCB staff and confirmed the project is eligible for low interest financing up to \$50,000,000.

### **DISCUSSION**

As the purveyor of the Antioch water system, the City treats and distributes raw water obtained from two sources; the San Joaquin River and the Contra Costa Canal. The City's ability to divert water from the San Joaquin River is dependent upon the concentration of chlorides in the water. There are times in every year when the salt concentration in the river water rises and the elevated chloride levels cause the water to be unusable by the City's existing water treatment facility. At these times, the City relies solely upon the Contra Costa Water District through the Contra Costa Canal for our raw water.

With pre-1914 adjudicated water rights to divert water for the needs of Antioch from the San Joaquin River, the City is in a unique and fortunate position of being able to pursue alternative means for treating water with high chloride levels. Over the last three years the City has made significant progress in developing a Brackish Water Desalination Project

with a goal of continuing to provide a high quality and reliable water supply during times of fluctuating River water quality.

Utilizing the SWRCB SRF loan, a proposed location and layout of a brackish water desalination facility has been established within the footprint of the City's existing Water Treatment Plant (WTP). An area on the southern end of the plant appears suitable for the construction of a 6 million gallons per day (MGD), reverse osmosis, brackish water desalination facility with available area to expand the facility to 16 MGD if regional partnerships are developed. This setting would allow the brackish water desalination facility to utilize portions of the existing WTP for pretreatment. The installation of a new pipeline segment that would connect the City's River Pump pipeline on Lone Tree Way to the WTP provides a cost effective means of conveying raw water to the new facility. A brine disposal pipeline within existing City rights of way is contemplated from the WTP to Delta Diablo located off of the Antioch/Pittsburg Highway. The brine could be discharged through the existing Delta Diablo outfall.

The Brackish Water Desalination Project would also assist the City in completing another project within its Capital Improvement Program (CIP). The CIP includes plans to upgrade the existing intake and fish screens. The Brackish Water Desalination Project would include constructing a new intake and fish screens at the location of the City's existing intake.

On July 25, 2017, the City Council authorized the City Manager to submit an application to the California Department of Water Resources for grant funding up to \$10,000,000 for the design and construction of the Brackish Water Desalination project from the Proposition 1 Water Desalination Grant Program. Although the City has not completed the EIR and selected a project, this application allows the City to continue to explore this funding opportunity. The final award decision for this grant opportunity is expected in December 2018.

A Notice of Preparation of an Environmental Impact Report (EIR) for this project was circulated from August 15, 2017 to September 14, 2017. This document was sent to the State Clearinghouse, Responsible and Trustee Agencies and other interested parties, and provided information describing the project and its potential environmental effects. A public scoping meeting was held on September 5, 2017 to discuss the proposed project and receive comments concerning the scope of the EIR. Staff is currently developing a draft EIR. It is anticipated City Council will be able to consider the EIR and select a preferred project in early summer 2018. The project implementation schedule will depend on funding obligations and the project delivery method. The project could be online in late 2019 or early 2020.

## **ATTACHMENTS**

A. PowerPoint Presentation





# Brackish Water Desalination Project

Update to Antioch City Council  
December 12, 2017



ATTACHMENT "A"





# Agenda

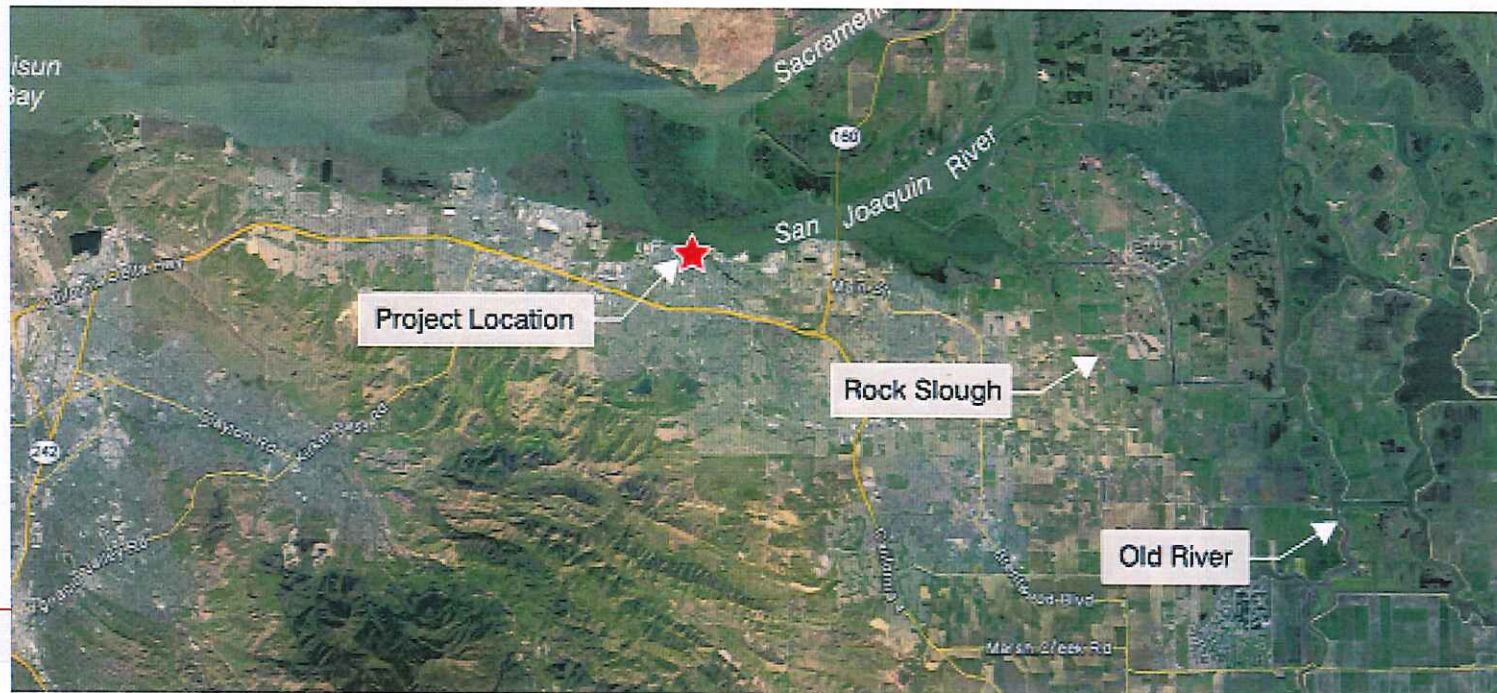
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- Project Background and Objectives
- Project Overview
- Accomplishments to Date
- Funding Update
- Schedule Update
- Upcoming Council Decisions



# City Water Supply

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



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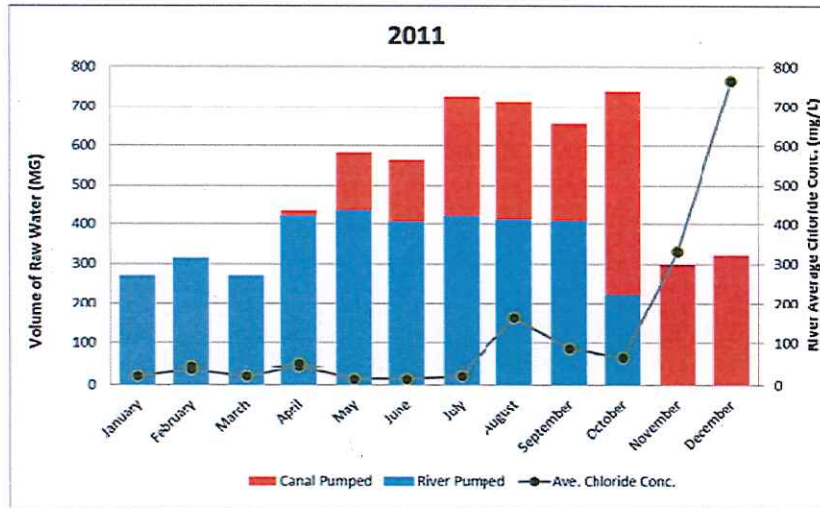
## Value of City's Water Rights is Being Eroded

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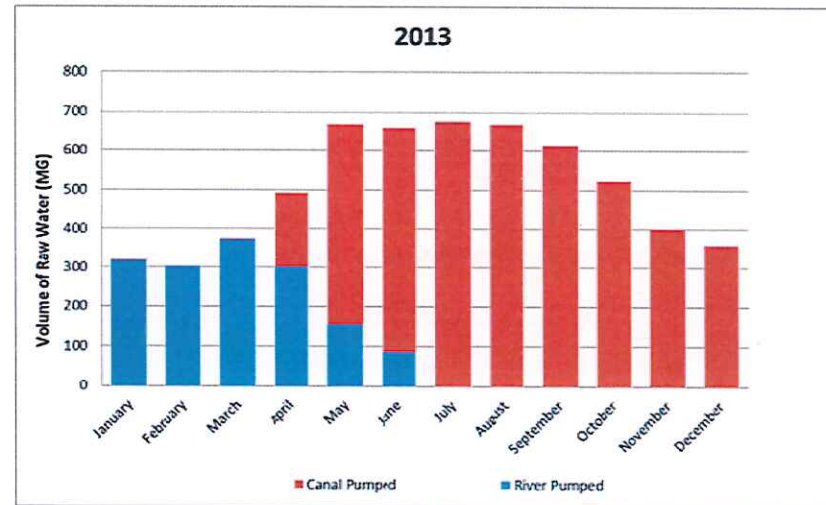
- Estimated Value of City Water Rights: \$70-\$100M
- Changes in Delta Water Management: WaterFix
- Cumulative Impacts of other projects degrading water quality in Western Delta
  - CCWD Settlement on WaterFix
  - Freeport
  - Development in San Joaquin Valley, etc.
- Climate Change: Increasing Frequency 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





## 3 Years Ago the City Began Investigating Brackish Water Project Opportunities

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- California in middle of 5yr drought
- City needed to find ways to mitigate for WaterFix
- Restore and maintain the value of the City's water rights
- Protect water quality and water reliability against future droughts
- Provide flexibility for City's needs and possible regional expansion
- Provide environmental and economic benefits





## 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
  - \$1000/AF (CCWD raw water charge + treatment costs)
- Estimated Water Cost Brackish Water Facility
  - \$920 to \$1,150/AF



## Project Overview

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- Treat 7.5MGD of brackish water to produce 6MGD finished water. Could be as much as 16MGD for a regional plant.
- New river intake with state-of-the-art fish screens (incorporates existing CIP project)
- Treatment facility at existing WTP site.
- Current plan is to discharge at DDSD existing outfall (Antioch owns 50% capacity). Negotiations underway.





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

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## 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

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- Received \$1M in State financing for planning effort
- Preparing EIR
- Developing project concepts and budgets
- Evaluating alternative ways to deliver project
- Pursuing outside funding – State grants and loans
- Identifying potential regional partners



# Funding Opportunities

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Total cost of environmental certification, design and construction of this project is estimated to be \$60M

- **Obtained:** \$1M low interest loan SWRCB State Revolving Fund program to cover the planning activities currently underway.
- **Applied:** \$10M Prop 1 Brackish Water Grant  
(State limit for grants is \$10M per project)
- **Future Potential:** Up to \$50M in State low interest loans specifically available for the brackish water project





# Project Schedule

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- Environmental Review Underway
  - Public Scoping Period Aug-Sept 2017
  - Draft EIR under development
  - EIR for Council consideration Summer 2018
- Preliminary Planning and Design Ongoing
- Final Design and Permitting late 2018
- Project Online late 2019/early 2020 depending on delivery method



# Upcoming City Council Decisions

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- Certify EIR
- Select Preferred Project
- Authorize acceptance of grants and loans from the state
- Approve, if any, regional partnership agreements
- Authorize proceeding with design and construction