San Elijo Joint Powers Authority



Protecting the environment. Preserving the coast.

SAN ELIJO JOINT POWERS AUTHORITY Recycled Water Program Advanced Water Treatment

Michael T. Thornton, P.E. General Manager

Who We Are...

San Elijo JPA
≻Member Agencies
• City of Encinitas
• City of Solana Beach

➢ Board of Directors

- Chair Tom Campbell
- Vice-Chair Mark Muir
- Teresa Barth
- David Zito



What We Do...

Vision - "We pursue innovative practices to produce clean water in an environmentally, socially, and fiscally responsible manner."



A History of Coastal Stewardship

Until the early 1950's, sewage was discharged into the lagoon and coastal waters for Cardiff and Solana Beach.

San Elijo Water Pollution Control Facility was built in 1965 in response to water pollution in the San Elijo Lagoon.



Serving Today, Planning for Tomorrow.

Moving beyond wastewater treatment & disposal paradigm; the San Elijo JPA is focusing on maximizing recycling.

RECYCLED WATER PROGRAM

- Produces approx. 1350 AFY
- Operated in Partnership with other local districts and cities
 - San Dieguito Water District
 - Santa Fe Irrigation District
 - Olivenhain Municipal Water District
 - City of Del Mar
- Reduces Ocean Discharge by 40%
- Strong Community Support

San Elijo Water Reclamation Facility

Recycled Water Monthly Demands



RECYCLED WATER SERVICE AREA



RECYCLED WATER SERVICE AREA

Customer Include: ✓ Del Mar Fairgrounds ✓ Golf Courses ✓ Caltrans

- Schools
- Parks
- Business ParksHOAs



RECYCLED WATER SERVICE AREA



PROGRAM CHALLENGES

Maintain Financial Sustainability
 Develop & Grow the Program
 Maintain Excellent Water Quality



TOTAL DISSOLVED SOLIDS (TDS)

Measurement of dissolved salts and minerals (e.g. calcium, magnesium, sulfate, chloride, sodium, etc.) in the water.

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Not a risk to human health
 Most plants have a limited tolerance
 Can impact some industrial processes
 Can limit the use of recycled water

ADVANCED WATER TREATMENT (AWT)

Treatment System

- ✓ Microfiltration (PALL)
- ✓ Reverse Osmosis



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AWT parallels existing recycled water sand filtration system

New RW capacity = 3.0 MGD ✓ (expandable to 3.5 MGD)

ADVANCED WATER TREATMENT

Build Footprint: ~5,000 sq ft System Startup: April 2013 Cost: \$5 million Grant: \$850,000



Existing RW Treatment Train

Wastewater Treatment







Existing RW Treatment Train



New RW Treatment Train

Existing RW Treatment Train

DynaSand

Filtration

AWT

Filtration

Chlorine

Disinfection

Wastewater Treatment

Design provides:

- ✓ Operational flexibility
- ✓ Cost effective (E&C)
- ✓ Expandability
- ✓ New Opportunities

New RW Treatment Train

Existing RW Treatment Train

Chlorine

Disinfection

IPR

Wastewater Treatment

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Future Opportunities?

DynaSand

Filtration

AWT

Filtration

Better Wastewater = Better Recycled Water

Addition of an Anaerobic Selector in the Activated Sludge Bioreactor has removed P from an average of 4.8 mg/l to less than 0.5 mg/l



IMPROVING COST EFFECTIVENESS

Wastewater treatment process was improved to produce "best water quality" for membrane filtration.

RESULTS:

- Low turbidity/more filterable water
- Reduced levels of orthophosphate (reduces scaling)
- Reduced chemical and energy use in secondary treatment process
- Improved treatment process stability (reduced variance in treated water quality)









Current cost of biological treatment: 45.6 kW/MG (61 hp/MG) \$109/MG, \$107/acre-ft

Maximizing Treatment Performance: Temperature for SRT Target



Seasonal Treatment Performance

----2008/2009# **---**2009/2010# **---**2010/2011#



Secondary Effluent Improvements



PHOSPHOROUS REMOVAL

Anaerobic Selector resulted in biological removal of phosphorous.

Reduces: Chemicals & labor associated w/filter cleaning.



Treatment Optimization Results – Better Treatment - Lower Cost

- Energy use reduced by ~800,000 kWh annually (or 40% reduction to achieve 61 HP/MG)
- Well flocculated biology no need for chemical addition to control settling (no polymer or NaOCl)
- Temperature adjusted SRT produces consistent effluent quality without nitrifying
- Significant improvements to water quality reduces the need for chemicals for filtration
- Provides bio-P removal at low SRT

MAXIMIZING COMMUNITY BENEFITS

- AWT provides the ability to do more than just produce "really clean" recycled water.
- New opportunity to strategically capture and treat urban runoff
- Urban Runoff is one of the leading reasons for Beach and Lagoon pollution.
- Impacts the City's storm water permit compliance
- Collaborated with the cities on a solution that leverages the treatment capacity of the proposed AWT.

San Elijo Water Reclamation Facility

Ave Encinitas

San Diego Fu

Storm Water System San Diego r



Construct diversion systems
 Use existing sewer system
 Treat at the SEWRF
 Protect coast waters

New water to recycle



PROJECT PROGRESS

- Design Completed (Kennedy/Jenks)
- Peer Review (Trussell Technology)
- ✓ Financial Feasibility Analysis (GDH)
- ✓CEQA documentation completed (DUDEK)
- ✓Grant funding awarded
- ✓ Project financing secured
- ✓Construction Initiated



SAN ELIJO JOINT POWERS AUTHORITY

Questions

Wastewater, storm water, recycled water... Providing Clean Water for the Future.