DATE: November 21, 2019
TO: Water Commission
FROM: Amanda Flesse, Wastewater System Manager
SUBJECT: El Estero Operations Update Following the Completion of the Secondary Aeration Basin Improvement Project

Recommendation:

That Water Commission receive an update on operations at the El Estero Water Resource Center following the completion of the Secondary Aeration Basin Improvement Project.

Background:

El Estero Water Resource Center processes approximately six million gallons of wastewater each day. El Estero was originally constructed in 1952; however, a majority of its current infrastructure was constructed in 1978 to meet 1972 Clean Water Act requirements. El Estero was originally designed to provide a high-rate activated sludge treatment system. While this system provided secondary effluent quality suitable to meet all regulatory requirements, the final effluent still had a higher level of turbidity than is desired for subsequent use in tertiary treatment or future advanced water treatment projects.

The Secondary Aeration Basin Improvement Project was intended to address longstanding issues with highly variable secondary effluent quality, operational inflexibility, and energy inefficiencies. The work consisted of modifications to El Estero’s secondary treatment process to a nitrification/denitrification system, upgrades to the existing aeration and secondary clarifier sludge withdrawal systems, and implementation of nitrate return to address odor control issues and clarifier performance issues.

Discussion:

In February 2019, the new secondary treatment process at El Estero went into commission. Since the system went online, treatment has improved substantially. One measure of water’s quality is its turbidity, or clarity. Turbidity is measured in NTU. Previously, the effluent from El Estero ranged between 8 and 10 NTU. Currently, our effluent is averaging 2 NTU, with periods in the morning near 1 NTU. The new nitrification/denitrification process produces a more stable secondary effluent, create higher-quality process water for the succeeding production of recycled water, and will yield a higher quality of treated effluent discharge into the Pacific Ocean.

As a result, the filterability of the water has increased substantially. The tertiary reclaimed water system works by pushing the clarified water through a series of straw-like filters with pores that are .01 microns in diameter, or “ultrafiltration” grade. If there are too many compounds in the water, these pores become plugged and will not allow water to pass through. This blockage requires operators to clean the system, and the frequency of these cleanings is indicative of the quality of the influent water to the system, which
results in limited production of recycled water. Since the Project has been completed, the frequency of tertiary cleanings has decreased noticeably, and the ability to reliably produce recycled water to our customers has increased. The better effluent water quality and the increased reliability of recycled water production is indicative of the success of the Project.

A video about this Project is available here:  
https://www.youtube.com/watch?v=ESK3Lg3dmm4&feature=youtu.b
Presentation Overview

- Construction
- Operations
- Optimizing the process
- SRF Video
CONSTRUCTION
CONSTRUCTION

• Began May 2016
• Commissioning began February 2019
• Construction Costs
  - $25,168,886 (Stanek)
  - $5,024,845 (Consultant Services)
  - $442,442.81 (Staff Support)
• SRF Loan - $32,000,000
PROJECT GOALS

• Change from Carbonaceous Mode to Nitrification and Denitrification
• Distribute flow equally
• Upgrade existing equipment
• Provide redundancy
• Address Odor Control Issues
• Improve energy efficiency
SUCCESSFUL

• Improved Turbidity
  - 1-3 NTU
• Improved flow distribution to basins
• Improved operations of Tertiary
Water Bears

- Tardigrade aka “Water Bears”
- Highly Resilient in most extreme environments
- Been found to survived in space, volcanoes, tropical rainforests, and in the Antarctic under layers of ice.
- Consumes the dissolved organic materials to produce a better quality effluent.
EEWRC Water Bears
OPTIMIZING PROCESS
Optimizing Operations

• Sealing Aeration Basin Gates
• Leveling Flumes
• Raising Gates
• Eliminating Dead Ends in the Process Channels
• Re-routing of Air Piping
• Seasonal Process Changes
SRF VIDEO

video link
Discussion