Recycled Water Use at the Pasatiempo Golf Club

Optimizing the Use of a Local Resource

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Water resource diversification continues to be critical

Recycled wastewater is a valuable part of a golf course water resource portfolio

Many details to consider for implementation
Some Recycled Water Use Considerations:

- **Is there enough** recycled water available when it is needed for optimal irrigation application rates and timing?
- **How will the water be treated** to meet Title 22 Tertiary Standards?
- **What happens to water not used for irrigation?**
  - Daily
  - Seasonally
- **What happens to the residuals** developed from meeting Title 22 Tertiary Standards?
Recycled Water Source

- Scotts Valley Water Reclamation Facility (SVWRF)
- Existing 1-mgd average flow capacity facility
- Produces consistent secondary effluent for ocean discharge
- Can produce tertiary effluent at additional cost
- Outfall pipeline runs adjacent to Pasatiempo Golf Course (7 miles from WWTP to Golf Course)
- Golf course planning on using up to a 2:1 Recycled Water : Potable Water blend.
SVWWTP Effluent Pipeline Overview

Discharge of secondary treated wastewater currently occurs approximately one mile from the shoreline in Monterey Bay National Marine Sanctuary at a depth of approximately 100 feet. The diffuse section of the outfall system is 2,000 feet in length with 35,400-gallon dilution tank and provides a minimum initial dilution of 189:1 parts seawater to plant effluent as determined by the State Water Resources Control Board.
Is there enough?
Is there enough?

Yes, but sometimes just enough

Requires operational flexibility

- On-site storage needed
- Ability to take recycled water 24 hr/day
How will the water be treated?

Option 1: Have SVWRF treat all effluent to Tertiary standards during irrigation periods

- This is 2-8x more tertiary recycled water than is needed on a daily basis. Overall, approximately 2x the needed water would get treated each irrigation season.
- Paying to treat 2x more water than needed is not ideal.
How will the water be treated?
How will the water be treated?

Option 2: Have SVWWTP treat only the water needed to Tertiary standards, separately pipe to the Golf Course

- 7 miles of pipeline, easements, etc. – far more expensive/time consuming
- Explored “pipe-in-pipe” alternative – expensive and problematic
Separate Pipeline?
How will the water be treated?

Option 3: Treat secondary effluent to tertiary standards at the Golf Course

- Allows treatment only what is used
- Requires local operation of a filtration and disinfection facility
- Explored different filtration options
  - Cloth
  - Microfiltration
  - Thread/Cartridge
How will the water be treated?

Based on preliminary cost assessment, decided on Option 3 – treat to tertiary standard on-site

- Preliminary selection of Amiad AMF Thread/Cartridge filter
  - Relatively inexpensive capital (although close with cloth filters)
  - Simplest/least expensive maintenance
  - Title 22 certified (certification performed at Lincoln WWTRF)
  - Good (although limited) reports from existing user (San Simeon WWTP)
  - Existing secondary effluent of consistent very high quality, making cartridge filter system seem feasible
  - Concern about performance, flux rates, backwash rates, general operating parameters and ease of operation
How will the water be treated?

- Amiad AMF Cartridge Filter

- cassettes

- cartridge
How will the water be treated?

○ Amiad AMF Cartridge Filter
Pilot Test

Performed 1-month pilot test

- Worked in concert with SVWWTP personnel
- Pilot unit supplied by Amiad (cost of pilot discounted from purchase price)
- Good, consistent treatment performance
- Optimized flux and backwash
  - Very low flux required to reduce backwash frequency to recommended rate
  - Resulted in specifying larger filters than originally anticipated
  - Still a cost saving
- Operationally very straightforward
Pilot Test

Proceeded with implementing Amiad AMF filters using operating and design parameters indicated during pilot test.
What happens to the water not used for irrigation?
What happens to the residuals?

Backwash waste

- Backwash waste has concentrated levels of any suspended solids in the secondary effluent
- Returned to secondary effluent pipeline
- Relies on blending with secondary effluent to maintain permit compliance at ocean outfall
- Difficult when Recycled Water use is near Secondary Effluent flowrate
- Currently exploring enhancing operational flexibility by adding option of some portion of sewer discharge of backwash waste, returning it to SVWWTP for re-processing of suspended solids removed by filtration.
What happens to the residuals?
Model of Filter Building
Questions? Contact

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