An Innovative and Cost-Effective Solution for Updating Your Reclaimed Filter Needs

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Presentation Outline

• Service Area
• Treatment Facilities
• Reclamation Facilities
• Filtration Needs
• Filter Evaluations
• Water Quality Data
• Capital Costs
Palm Bay Utility Service Area

- 97 square mile service area
- 104,000 population
- Two treatment plant facilities
  - WWTP: 4.0 mgd
  - Troutman Water Reclamation Facility: 1.2 mgd
- Acquired from GDU in 1992
## FDEP Permitted Facilities

<table>
<thead>
<tr>
<th>Facility Component</th>
<th>Permitted Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater Treatment Plant</td>
<td>4.0 MGD</td>
</tr>
<tr>
<td>Water Reclamation Facility</td>
<td>1.2 MGD</td>
</tr>
<tr>
<td>Reuse System</td>
<td>2.3 MGD</td>
</tr>
<tr>
<td>Deep Injection Well</td>
<td>5.0 MGD</td>
</tr>
</tbody>
</table>
Wastewater Treatment Plant Facility

- 4.0 mgd permitted capacity
- Conventional activated sludge treatment plant
  - Pre-treatment (screening & grit removal)
  - Aeration (1.3 MG)
  - Secondary clarification
- Effluent disposal - 5.0 mgd deep injection well or pumped to WRF
Troutman Water Reclamation Facility

- 1.2 mgd AADF capacity
- Screening
- Aeration / Clarification
- Filtration
- Chlorination
# Reclaimed Water Users

<table>
<thead>
<tr>
<th>Permitted User</th>
<th>User Type</th>
<th>Capacity (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Harris Corporation</td>
<td>Irrigation</td>
<td>0.570</td>
</tr>
<tr>
<td>2. Intersil</td>
<td>Irrigation &amp; Cooling Tower</td>
<td>0.440</td>
</tr>
<tr>
<td>3. Sandy Pines (3 Phases)</td>
<td>Irrigation</td>
<td>0.260</td>
</tr>
<tr>
<td>4. Palm Bay WWTF &amp; WRF</td>
<td>Irrigation</td>
<td>0.100</td>
</tr>
<tr>
<td>5. Palm Bay Greens</td>
<td>Future Development</td>
<td>0.210</td>
</tr>
<tr>
<td>6. Knecht Park</td>
<td>Irrigation</td>
<td>0.097</td>
</tr>
<tr>
<td><strong>TOTAL REUSE</strong></td>
<td></td>
<td><strong>1.677</strong></td>
</tr>
</tbody>
</table>
Original Filtration Design

- 4 DynaSand® upflow sand filters
- Gravity fed from secondary clarifiers
- Tank dimensions:
  - 12’-7” (L) x 8’-2” (W) x 15’ (D)
- Rated capacity = 0.67 mgd/filter (4.55 gpm/ft²)
- Total Filter Capacity = 2.68 mgd (4 filters)
New Filter Drivers

- Future capacity = 4.4 mgd
- Rising O&M costs (existing filters)
- Maintain existing hydraulic profile
- Use existing tankage (capital $ savings)
  - Rehab 3 existing filter banks
  - Use 4th filter bank as a pump or equipment room
- Retrofit a single filter while others remain on-line
Filter Evaluations

• Three manufacturers evaluated:
  • Kruger/Hydrotech Discfilter
  • Nova Water Technologies
  • Aqua-Aerobic Systems

• Aqua-Aerobic (AquaDisk®)
  • Installed into existing tankage
  • Operate in a submerged environment
  • Maintains existing hydraulics
  • Minimal structural modifications required
AquaDisk® Cloth Media Filter

Maintained existing hydraulic profile at average daily & peak hour flow rates.
AquaDisk® Cloth Media Filter

- No major structural modifications required
- No modification of the influent channel necessary
- Weir boxes installed for even flow distribution and to avoid hydraulic overloading on a single filter unit
AquaDisk® Cloth Media Filter

- Filter Surface Area – 2 disks provide 646 ft²
- Design Capacity = 1.5 MGD (ADF); 3.0 MGD (PHF)
- Hydraulic loading rate = 3.25 gpm/ft² (ADF); 6.5 gpm/ft² (PHF)
Project Timeline

- Planning – 2006
- Design – 2007
- Permit Issued – Jan. 2008
- Owner Purchase – Spring 2008
- Construction – Spring 2009
- Commissioning – Nov. 2009
Influent Water Quality – CBOD$_5$ & TSS

Troutman Water Reclamation Facility

- 10-yr period of record: 2002 – 2012

- Annual Average Influent CBOD$_5$
  - Concentration range: 110 – 190 mg/L
  - Loading range: 854 – 1,471 lbs/day

- Annual Average Influent TSS
  - Concentration range: 88 – 187 mg/L
  - Loading range: 590 – 1,230 lbs/day
CBOD$_5$ & TSS Effluent Monitoring Data

![Graph showing CBOD$_5$ and TSS effluent concentrations over time.]
Filter Rehabilitation Project Costs ($526K)

- Owner Purchased Equipment: $362K
- Construction: $85K
- Engineering: $69K
- Misc. Fabrication: $10K
Conclusions/Summary

- An economical solution for the City’s future filtration needs
- Increased reclaimed water production
- Low capital costs
  - Utilized existing structural components
  - Maintain existing hydraulic profile
- Provided a phased approach for future filtration demands