WASTEWATER PRETREATMENT PANEL DISCUSSION

An occasion to discuss our common equipment preferences, challenges, and best practices.

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TOPICS OF DISCUSSION

• Pumping Stations
• Point Source Treatment
• Grit Removal
• Screening
• EQ Tanks
• DAF
• Air Dissolving System
• Chemical Pretreatment
• Operators and Better Practices
• DAF Sludge Processing
• DAF Sludge Disposal
• Instrumentation and Control
• Facility Design
PUMPING SYSTEMS

• Type
• Size
• Preventative Maintenance
POINT SOURCE TREATMENT

- Evaporator
- Dry Cleanup
- Liquid Hauloff
- Grease/Water Separator
- Micro screening
GRIT REMOVAL

- Type
- Waste stream types
- Size
- Disposal
- Operating experiences
SCREENING

- Type
- Opening size
- Spray Bar
- Water Temperature
- Screening Press/Disposal
- Operating experiences
EQUALIZATION BASIN

- Mixing Type
- Volume
- Aeration vs. No Aeration
- Covered vs. Uncovered
- Tank Material and Design
- Level Monitoring
- Operating Experiences
DAF

- 1 vs. 2 Stage
- High Rate vs. Conventional
- Recirculation/Pressurization System
- Typical Design Criteria
- Materials
- Bottom Solids Removal
<table>
<thead>
<tr>
<th>Type of Facility</th>
<th>DAF Description</th>
<th>Air System</th>
<th>GPM flow</th>
<th>Total Recycle GPM</th>
<th>Chemical Program</th>
<th>Chemical Program 1</th>
<th>Typical Influent TSS, mg/l</th>
<th>Typical Effluent TSS, mg/l</th>
<th>% Removal, TSS</th>
<th>Volume, gallons</th>
<th>Surface Area, ft²</th>
<th>Detention Time, hrs</th>
<th>Hydraulic Loading Rate, gpm/ft²</th>
<th>HLR with Recycle, gpm/ft²</th>
<th>Solids Loading, TSS lbs/hr/ft²</th>
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<td>1500</td>
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<td>2 concrete DAFs in parallel</td>
<td>Air Whip (one on each DAF)</td>
<td>2500</td>
<td>600</td>
<td>Partial</td>
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<td>1200</td>
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<td>Full</td>
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<td>ETS whitewater</td>
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<td>2.04</td>
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</table>

1: Partial = typically an organic flocculant and maybe an organic coagulant, but we do not need to run DAF effectively.
2: Full = typically an organic flocculant and coagulant and sometimes an inorganic coagulant, and due to permit limits or other DAF must run effectively.

2: Detention Time, hrs is calculated without recycle flow.
Beef Plants - Hydraulic & Solids Loading vs. TSS Removal

Poultry Plants - Hydraulic & Solids Loading vs. TSS Removal

Pork Plants - Hydraulic & Solids Loading vs. TSS Removal
AIR DISSOLVING SYSTEM

- Types
- Air Control
- Operating Experiences
CHEMICAL PRETREATMENT

• Mixing
• pH Control
• Coagulants
• Polymers
• Dosage Control
• Operator Experience
OPERATORS AND BETTER PRACTICES

- Number of Operators
- What Dept. is Responsible?
- Operator Qualifications
- How many shifts?
- Full Coverage vs. Part Time
- Other Operator Duties
- Process Control Best Practices
<table>
<thead>
<tr>
<th>Type of Facility</th>
<th>Number of Operators per Shift</th>
<th>Responsible Department</th>
<th>Certifications</th>
<th>Shift Coverage</th>
<th>Process Control</th>
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<tbody>
<tr>
<td>Harvest</td>
<td>1-3</td>
<td>Maintenance/WWTP/Rendering</td>
<td>Varies</td>
<td>Full and Part Time</td>
<td>Influent/Effluent TSS every 15 mins</td>
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<td>All Shifts</td>
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<td>pH interlock/monitoring</td>
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<td>Chemical feed rates</td>
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<td>EQ tank levels</td>
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<td>Ground Beef</td>
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<td>Maintenance</td>
<td>None</td>
<td>Part Time</td>
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<td>pH monitoring</td>
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<td>Grease trap pumping frequency</td>
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<td>Part Time</td>
<td>pH interlock/monitoring</td>
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<td>EQ tank levels</td>
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<td>Grease trap pumping frequency</td>
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DAF SLUDGE PROCESSING

- Float Transfer
- Bottom Solids Pumps
- Processing Machinery
DAF SLUDGE DISPOSAL

• Land Application
• Landfill
• Rendering/Grease Recovery
• Compost
• Anaerobic Digestion
• Chemical Considerations
INSTRUMENTATION & CONTROL

- Level Instruments
- High Level Alarms
- Flow Meters
- EQ/DAF feed control
- Automated Chemical Dose
FACILITY DESIGN

• Building Construction
• Process Piping
• Metals Coating
• HVAC
• Door Materials