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• Western Virginia Water Authority’s Blue Ridge Brawlers Wins 2016 Operations Challenge Competition

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Canada Patent 2285146, 2688012, 2690156 Others Pending
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**Finding Strength In Numbers**
The Water Advocates website makes it easier to get involved in water-related legislation and regulations.

**2016 Operations Challenge**
Western Virginia Water Authority’s Blue Ridge Brawlers win the 2016 Operations Challenge Competition at WEFTEC.

**33rd Annual Industrial Waste & Pretreatment Conference**
Please join us on March 6-7, 2017 at the Omni Charlottesville for the Industrial Waste & Pretreatment Conference. This year we will focus on “The Many Hats of the Pretreatment World.”

**WaterJAM 2016 Wrap-up**
WaterJAM 2016, held in Virginia Beach September 12-15 was another great conference.

**COVER FEATURE**

**Strong Enough? Piloting Aerobic vs. Anaerobic Treatment for Food and Beverage Wastewater**
A central Pennsylvania fruit processing facility serves as the corporate headquarters for a farmers’ cooperative and processes a wide array of fruits from local farms to produce a range of products resulting in unique and varied process wastewater. Historically combined with the facility sanitary wastewater, this stream flows through a screening facility then to unlined earthen ponds.

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Student Activities Committee 51
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Buchanan, VA 24066

**Aeromod** - Municipal and industrial wastewater treatment, biological nutrient removal (Sequox), ClarAtor clarifier

**Ambio** - Photoionisation odor control

**Amwell** - Bar screens, clarifiers, gear drives, grit removal, paddle flocculators, rectangular collectors, rotary distributors, DuraMax stainless steel chains, scum skimmers

**Aquaturobo** - Surface aerators, mechanical mixers, decanters, floatables control

**Aquionics** - Open and closed channel UV disinfection

**BDP Industries** - Belt filter presses, screw presses, gravity belt thickeners, rotary drum thickeners

**Keystone Conveyor** - Belt and screw conveyors

**Kruger** - AnoxKaldness IFAS and MBBR, ANITAmox Annamox deammonification, BIOSTYR Biological Aerated Filter, NEOSEP MBR, OASES high purity oxygen systems, ACTIFLO ballasted clarification, HydroTech Discfilter and Drumfilter Odo Watch/ Odo Sulf.

**Lobepro** - Rotary lobe pumps

**Mixtec North America** - Mixers and Flocculators for water and wastewater treatment

**PCM** - Progressive cavity pumps

**Polydyne** - Dry and emulsion polymers, Polymer feed systems.

**Prime Solutions** - Rotary Press dewatering systems

**Pulsair** - Mega-Bubble non-aerating mix systems

**Stamford Scientific** - Fine/coarse bubble diffusers, membrane diffusers, ceramic retrofits, fixed or retrievable grids

**Tasco hydro** - Dissolved air flotation lamella clarifiers, grease/concentrators, oil/water separators.

**Thermal Process Systems** - Class A thermophilic biosolids ATAD systems, mesophilic aerobic digestion, sidestream ammonia treatment

**Ultraflote** - Aluminum geodesic domes and heavy-duty flat covers.

**USEMCO** - Package water/booster stations & controls, control systems

**Wilco** - Drinking water treatment (NF/MF/UF/RO)

**Wilen** - Water and Wastewater Pumps, Submersible, Drypits, Grinders, End suction, Split case horizontal.

**WTP** - Headworks screenings and grit removal

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Focusing on Our Membership

“Leadership is a gift, given by those who follow, you have to be worthy of it.” – General Mark Welch (Ret), USAF

As leaders, we have a duty to encourage and motivate those who show passion and commitment in fullership to lead. VWEA has been successfully doing this for years. As a result, our member committees are comprised of numerous dedicated volunteers who provide education, subject matter knowledge, experience, passion, commitment, and determination to be successful in all they do. We must continue to facilitate this great achievement and provide it as a stepping stone for our future membership to build upon.

The importance of preserving water, recovering and treating wastewater, and increasing subject matter knowledge about technology advancements is forever growing in our day and time. Our vision to “preserve and enhance Virginia’s Water Environment, now and for future generations” is honorable and exceptional. Our mission to support this vision is imperative.

You might ask, how do we set goals and continue to lead? Well, we would not be true leaders if we didn’t start by giving our association members, friends, volunteers, and associates the recognition they deserve by highlighting the accomplishments of previous years. Our committees tirelessly work to provide high-quality conferences and seminars throughout the year and for that, I offer a special thank-you for a job well done. Our annual conference, the Water and Wastewater Joint Annual Meeting (WaterJAM) is the biggest conference conducted jointly with our colleagues from the Virginia American Water Works Association each year. As you can see in the chart, attendance has been growing, which is a sign that we are succeeding in our industry. We are spreading knowledge and educating our populace on the ways they can contribute to the preservation and enhancement of the environment.

For this upcoming year, we will mainly focus on our membership, specifically how we can grow it with our state-only member initiative. Another area of attention will be internal and external committee collaboration to further knowledge and enhance emotional intelligence and self-awareness among leadership. Lastly, we will maximize our presence as a membership association by educating future generations about the intricate water world we live in.

I cannot think of a better time to be engaged and involved in our industry than today. With the help of technology, we are using less and less water and consumption rates are on the decline. We are replenishing our water aquifers with treated wastewater thereby reducing pollutant discharges to our waterways. We are drinking wastewater (treated, of course), which evidently completes the water reclamation cycle.

What more can I ask for than to step in this role? All I can do is thank all of the previous VWEA presidents, board members, committee leaders and volunteers for making our association what it is today. VWEA is nothing short of a success due to the dedication of our volunteers which always play a dynamic role in pushing us forward. On behalf of the VWEA board, I thank you. I am truly honored and proud to be your president this coming year and forever thankful for this opportunity.

How else can we contribute to the health of the water environment? Please visit us on www.vwea.org and give us your feedback.
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Each year at WaterJAM we take the time to recognize and award members for their successes and contributions to VWEA, WEF, and the water environment field. Below is the list of 2016 Award winners.

**WEF Laboratory Analyst Award**  
Brandon Alexander  
Newport News Shipbuilding

**WEF William D. Hatfield Award**  
Brian McNamara  
HRSD

**Golden Manhole Award**  
Chris Wilson  
Brown and Caldwell

**VWEA Public Official Award**  
Senator Emmett Hanger

**A.H. Paessler Award**  
David Paylor  
DEQ

**Enslow-Hedgepeth Award**  
Dr. Charles Bott  
HRSD

**WEF Arthur Sidney Bedell Award**  
Grace LeRose  
City of Richmond

**VWEA/VA AWWA Outstanding Young Professional Award**  
Ryan Radspinner  
HRSD

To view award descriptions and the historical list of winners, visit our website at http://www.vwea.org/?page=Awards.

In addition, the following members were honored for their sustained, long-term service and contributions to VWEA and WEF.

**WEF Life Members**  
Thomas Decker  
Thomas Grizzard  
Allen Hogge

**VWEA Life Members**  
James Chastain  
Heyward, Incorporated  
Robert Forgione  
UOSA  
Jeanie Grandstaff  
Hopewell Water Renewal  
Andy Landrum  
Whitman, Requardt and Associates  
Liliana Maldonado  
CH2M  
Kathy Mestayer  
KMA Consulting

**5-S inductees**  
Laurissa Cubbage  
Greeley and Hansen  
Shawn Heselton  
HRSD  
Phill Yi  
Hazem and Sawyer

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“REIC is the only lab we use now. Having a point of contact at the lab is an excellent service. We don’t often have to bother them, but when we do it is nice to know who to speak to.”

“REIC samples our annual whole influent and effluent event and have always shown outstanding knowledge and commitment to proper sampling technique. This event is a multi-day, 24-hour day event.”

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* 98.4 percent of REIC clients, according to a survey conducted in June 2016, responded as satisfied with REIC services and client interactions.

* National lab ranking reported in "Maxwell/ELWR 2016 Laboratory Survey and Analysis", in the June 2016 issue of "Environmental Laboratory. Washington Report."
INTRODUCTION

A central Pennsylvania fruit processing facility serves as the corporate headquarters for a farmers’ cooperative and is the second largest facility in the fleet. It processes a wide array of fruits from local farms to produce a range of products resulting in unique and varied process wastewater. Historically combined with the facility sanitary wastewater, this stream flows through a screening facility then to unlined earthen ponds. Treatment of the pond effluent includes lime addition followed by pumping to a trickling filter and spray irrigation system located offsite northwest of the plant.

The existing treatment system did not reliably meet permit limitations for spray irrigation and posed a limitation to production volumes, so the Pennsylvania Department of Environmental Protection (PADEP) and the cooperative agreed to the construction of a new treatment system and establishment of a new surface-water discharge location.

Strong Enough?

Piloting Aerobic vs. Anaerobic Treatment for Food and Beverage Wastewater

David Riedel1*, Octavio Casavantes2, Jay Kulowiec3

1 Arcadis, Inc.  
2 San Diego Water Authority  
3 Industrial Water/Wastewater Consultancy, LLC  
* Corresponding Author: David.Riedel@arcadis.com, T: 703-465-4238
The cooperative embarked on an evaluation to determine a viable treatment process that could achieve compliance with the proposed discharge limits (Table 1). The available process wastewater data indicated a significant organic load paired with nutrient deficiency, which favored two possible treatment methods: 1) aerobic membrane bioreactor (MBR) or 2) low-rate anaerobic treatment followed by aerobic MBR polishing.

Food processing wastewaters often contain high, readily degradable organic content that is typically amenable to anaerobic treatment. In the case of this facility’s wastewater, the historical data showed that the chemical oxygen demand (COD) and biochemical oxygen demand (BOD) were average for effective anaerobic digestion. Consequently, a definitive selection of a single treatment technology was not possible. Table 2 compares the advantages and disadvantages of the aerobic MBR (AER MBR) to the low-rate anaerobic digestion plus aerobic MBR (ANA+AER MBR).

Because neither technology definitively stood out as the front-runner after the initial conceptual evaluation, the design team recommended that the cooperative pilot test the two, side-by-side. GE’s ZeeWeed® MBR was selected as the AER MBR technology, and ADI’s BVF® low-rate anaerobic reactor coupled with an aerobic MBR was selected as the ANA+AER MBR technology for the pilot.

GE’s ZeeWeed® MBR system has a well-documented record of performance on a wide variety of industrial wastewater streams, including food processing wastewater. It uses hollow fiber ultrafiltration membranes to reject the suspended solids.

### Table 1: Historical Facility Data and Proposed PADEP Limits

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Monthly Avg</th>
<th>Monthly Min</th>
<th>Monthly Max</th>
<th>Proposed Avg Monthly Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow (m³/d)</td>
<td>403</td>
<td>---</td>
<td>---</td>
<td>Report</td>
</tr>
<tr>
<td>Wastewater pH</td>
<td>4.12</td>
<td>3.76</td>
<td>4.74</td>
<td>6 to 9</td>
</tr>
<tr>
<td>BOD (mg/L)</td>
<td>2,273</td>
<td>1,156</td>
<td>4,093</td>
<td>10</td>
</tr>
<tr>
<td>COD (mg/L)</td>
<td>4,131</td>
<td>1,840</td>
<td>6,430</td>
<td>No Limit</td>
</tr>
<tr>
<td>TSS (mg/L)</td>
<td>223</td>
<td>50.0</td>
<td>786</td>
<td>10</td>
</tr>
<tr>
<td>TDS (mg/L)</td>
<td>2,539</td>
<td>1,382</td>
<td>5,763</td>
<td>2,000</td>
</tr>
<tr>
<td>Total N (mg/L)</td>
<td>11.5</td>
<td>4.61</td>
<td>26.0</td>
<td>12</td>
</tr>
<tr>
<td>NH₃-N (mg/L)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>2.0 (¹) 6.0 (²)</td>
</tr>
<tr>
<td>Total P (mg/L)</td>
<td>4.24</td>
<td>1.90</td>
<td>11.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Total Al (mg/L)</td>
<td>1.42</td>
<td>0.460</td>
<td>2.80</td>
<td>0.536</td>
</tr>
<tr>
<td>Total Ca (mg/L)</td>
<td>358</td>
<td>22.2</td>
<td>861</td>
<td>No Limit</td>
</tr>
<tr>
<td>Total Cu (mg/L)</td>
<td>0.040</td>
<td>0.010</td>
<td>0.070</td>
<td>0.010</td>
</tr>
<tr>
<td>Total Fe(mg/L)</td>
<td>5.89</td>
<td>2.90</td>
<td>37.0</td>
<td>1.671</td>
</tr>
<tr>
<td>Dissolved Fe (mg/L)</td>
<td>2.59</td>
<td>0.49</td>
<td>5.80</td>
<td>0.334</td>
</tr>
<tr>
<td>Total Mn (mg/L)</td>
<td>0.23</td>
<td>0.10</td>
<td>0.87</td>
<td>1.114</td>
</tr>
<tr>
<td>Total Mg (mg/L)</td>
<td>9.03</td>
<td>3.32</td>
<td>14.00</td>
<td>No Limit</td>
</tr>
<tr>
<td>Total Na (mg/L)</td>
<td>80.97</td>
<td>42.00</td>
<td>130.00</td>
<td>No Limit</td>
</tr>
<tr>
<td>Total Pb (mg/L)</td>
<td>0.22</td>
<td>0.05</td>
<td>2.10</td>
<td>0.0035</td>
</tr>
<tr>
<td>Total Zn (mg/L)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>0.0856</td>
</tr>
<tr>
<td>Color (Pt-Co U.)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>91</td>
</tr>
</tbody>
</table>

¹ NH₃-N limit applies May 1 to October 31
² NH₃-N limit applies November 1 to April 31
TDS – total dissolved solids
TSS – total suspended solids
Pt-Co U. – Platinum-Cobalt Units
associated with the mixed liquor generated in aerobic, anaerobic, or anoxic activated sludge systems. In general, MBR systems can operate at a higher mixed liquor suspended solids (MLSS) concentration than conventional activated sludge systems, which makes them more resilient to changes in influent loadings, provides a more robust biomass inventory, and reduces the aerobic reactor size.

ADI’s BVF® low-rate anaerobic reactor is especially suited for readily degradable wastewaters with high organic content such as food processing waste streams. The long solids residence times (SRTs) in this low-rate system foster the growth of resilient anaerobic microbes that can withstand changes in the influent and continue to consume greater than 90 percent of the influent organic load. To polish the remaining organic load and any residual ammonia, ADI often couples the BVF® reactor with an aerobic and, if necessary, anoxic reactor with solids-liquid separation by ultrafiltration membranes. ADI typically uses flat-sheet ultrafiltration membranes like those manufactured by Kubota.

These two systems were pilot tested July through October of 2013. The selected months corresponded to several different production seasons including those for cherries, peaches, apples and teas. The design team wanted to confirm that the systems could handle the changes in wastewater associated with each production season. Additional objectives of the pilot testing included: 1) further influent characterization, 2) confirmation and refinement of design assumptions, 3) development of operational criteria, and 4) selection of the preferred treatment technology.

Table 2: Comparison of Advantages and Disadvantages of AER MBR to ANA+AER MBR for the Facility

<table>
<thead>
<tr>
<th></th>
<th>AER MBR</th>
<th>ANA + AER MBR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-rate system</td>
<td>Lower energy consumption</td>
<td></td>
</tr>
<tr>
<td>Well-established technology</td>
<td>Combined Heat and Power (CHP) opportunity</td>
<td></td>
</tr>
<tr>
<td>High-quality effluent</td>
<td>High-quality effluent</td>
<td></td>
</tr>
<tr>
<td>Optimal performance with low to medium organic load</td>
<td>Smaller aerobic system</td>
<td></td>
</tr>
<tr>
<td>Disadvantages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy intensive</td>
<td>Large anaerobic volume</td>
<td></td>
</tr>
<tr>
<td>Large aerobic volume</td>
<td>Optimal performance with high organic load</td>
<td></td>
</tr>
<tr>
<td>No CHP opportunity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1

Figure 2
METHODOLOGY
The two technologies were pilot tested at the facility in an unused vinegar plant, which provided protection from the elements and ready sources of power, water, and drains. Raw wastewater was collected over 24 hours from the screen house in 1,000-liter (L) totes and transported to the vinegar plant by fork-lift so that the pilot systems could be fed a composite of the preceding day’s screened wastewater. In this configuration, the pilot systems were afforded little equalization. Figures 1 and 2 illustrate the process configurations for each pilot system.

RESULTS AND DISCUSSION
Conventional Parameters
The following tables summarize the effluent quality sampling results and key design criteria for the two pilot systems.

Table 3 illustrates the AER MBR pilot unit was able to meet the expected discharge limits. Table 4 summarizes the pilot operating conditions compared to the design criteria. A few items to note:

- MLSS target concentration of 6,000 – 10,000 mg/L.
- The pilot unit achieved >95% COD and BOD removal when sufficient nitrogen and phosphorus species were present in the influent (with or without supplementing). However, the AER MBR did occasionally exhibit spikes in effluent BOD above the permitted 10 mg/L limit.
- pH adjustment of the influent wastewater was required throughout the pilot test because it ranged from pH 4.0 to 12.0. The target pH in the MBR was 6.8 to 8.0.
- Urea addition was required; however, there were difficulties dosing the appropriate amount due to analytical errors in the TKN measurement, largely attributed to color interference with the spectrophotometric analysis. The ultimate target nitrogen content was 3.5 mg/L for each 100 mg/L of influent COD.
- High concentrations of NO3-N due to nitrification of excess urea contributed to elevated effluent total nitrogen concentrations.

Table 5 illustrates the ANA + AER MBR pilot unit was able to meet the expected discharge limits. Table 6 summarizes the pilot operating conditions compared to the design criteria.

### Table 3: AER MBR Pilot Testing Results (6/25/2013 through 10/21/2013)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum Concentration</th>
<th>Maximum Concentration</th>
<th>Average Concentration</th>
<th>Expected Limits (Monthly Avg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COD (mg/L)</td>
<td>29</td>
<td>959</td>
<td>122</td>
<td>-</td>
</tr>
<tr>
<td>TSS (mg/L)</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>VSS (mg/L)</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>TDS (mg/L)</td>
<td>112</td>
<td>4,544</td>
<td>1,122</td>
<td>2,000</td>
</tr>
<tr>
<td>pH (S.U.)</td>
<td>-</td>
<td>9</td>
<td>6</td>
<td>6-9</td>
</tr>
<tr>
<td>BOD (mg/L)</td>
<td>2</td>
<td>107</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>NH3-N (mg/L)</td>
<td>5</td>
<td>65</td>
<td>34</td>
<td>2.0 (1)   6.0 (2)</td>
</tr>
<tr>
<td>Total N (mg/L)</td>
<td>2</td>
<td>112</td>
<td>57</td>
<td>12</td>
</tr>
<tr>
<td>Total P (mg/L)</td>
<td>MDL</td>
<td>7</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Aluminum (mg/L)</td>
<td>0.23</td>
<td>1.28</td>
<td>0.6</td>
<td>0.582</td>
</tr>
<tr>
<td>Copper (mg/L)</td>
<td>0.01</td>
<td>0.05</td>
<td>0.03</td>
<td>Report</td>
</tr>
<tr>
<td>Iron (mg/L)</td>
<td>0.06</td>
<td>1.46</td>
<td>0.35</td>
<td>1.815</td>
</tr>
<tr>
<td>Manganese (mg/L)</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>Report</td>
</tr>
<tr>
<td>Lead (mg/L)</td>
<td>0.005</td>
<td>0.005</td>
<td>0.005</td>
<td>Report</td>
</tr>
<tr>
<td>Zinc (mg/L)</td>
<td>0.01</td>
<td>0.52</td>
<td>0.29</td>
<td>0.0929</td>
</tr>
<tr>
<td>FOG (mg/L)</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>15</td>
</tr>
<tr>
<td>Color (Pt-Co U.)</td>
<td>43</td>
<td>1,500</td>
<td>250</td>
<td>91</td>
</tr>
</tbody>
</table>

(1) NH3-N limit applies May 1 to October 31
(2) NH3-N limit applies November 1 to April 31
A few items to note:

- Anaerobic degradation accounted for approximately 90-96% (or greater) of the influent COD removal. The AER MBR achieved an additional 80-95% removal with an average system effluent COD of 45 mg/L. Total system COD removal efficiency was >99.5%.

- The anaerobic reactor achieved 98% BOD removal and the MBR removed the remaining 70 mg/L, resulting in a 100% BOD removal across the system. BOD was consistently < 2 mg/L.

- TSS discharge from the anaerobic reactor was typically less than 300 mg/L, with excursions occurring only when the reactor organic loading rate (OLR) was elevated. The MBR was seeded with mixed liquor at a concentration of 4,000 mg/L MLSS, with the intention of growing the biomass concentration to 7,000 to 13,000 mg/L. The membranes consistently produced permeate with < 1 mg/L TSS.

- The anaerobic reactor required approximately 1,000 mg/L as CaCO$_3$ of alkalinity during startup, which decreased to 300 to 480 mg/L as CaCO$_3$ once steady state was achieved. During peach season, minimal alkalinity was required due to the usage of potassium hydroxide (KOH) in the fruit processing operations.

- The anaerobic process prefers to operate at > 30 degrees Celsius (°C); however, COD removal did not significantly decrease when it operated at 25°C at the end of the pilot testing. The aerobic temperature ranged from 19 to 31°C with an average of 25°C.

- The target anaerobic effluent NH$_3$-N and PO$_4$-P concentrations were 10 and 2 mg/L, respectively, to ensure adequate nutrients for aerobic biomass growth. Limited urea addition and no H$_2$PO$_4$ addition were required due to sufficient nutrients in the influent. The MBR consistently nitrified the residual NH$_3$-N from the anaerobic reactor effluent to < 0.2 mg/L. To meet the 12 mg/L total nitrogen limit, the full-scale system will include an anoxic zone for denitrification. MBR effluent total phosphorus (TP) concentrations ranged from 0.4 to 13.5 mg/L, with an average of 4.4 mg/L. To meet the 0.5 mg/L TP limit, the full-scale system will use chemical phosphorus removal and/or purchasing of credits.

- Anaerobic biogas production proportionally followed the increase and decrease in organic loading rates and generally matched

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum Concentration</th>
<th>Maximum Concentration</th>
<th>Average Concentration</th>
<th>Expected Limits (Monthly Avg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COD (mg/L)</td>
<td>21</td>
<td>93</td>
<td>44</td>
<td>-</td>
</tr>
<tr>
<td>TSS (mg/L)</td>
<td>1</td>
<td>47</td>
<td>3.5</td>
<td>10</td>
</tr>
<tr>
<td>VSS (mg/L)</td>
<td>1</td>
<td>10</td>
<td>1.6</td>
<td>-</td>
</tr>
<tr>
<td>TDS (mg/L)</td>
<td>500</td>
<td>3,260</td>
<td>1,472</td>
<td>2,000</td>
</tr>
<tr>
<td>pH (S.U.)</td>
<td>6.4</td>
<td>9.4</td>
<td>8.5</td>
<td>6-9</td>
</tr>
<tr>
<td>BOD (mg/L)</td>
<td>&lt;2</td>
<td>2.4</td>
<td>&lt;2</td>
<td>-</td>
</tr>
<tr>
<td>NH3-N (mg/L)</td>
<td>0.1</td>
<td>0.9</td>
<td>0.2</td>
<td>2.0 (1) 6.0 (2)</td>
</tr>
<tr>
<td>Total N (mg/L)</td>
<td>0.7</td>
<td>49.5</td>
<td>13.3</td>
<td>12</td>
</tr>
<tr>
<td>Total P (mg/L)</td>
<td>ND</td>
<td>13.5</td>
<td>1.9</td>
<td>0.5</td>
</tr>
<tr>
<td>Aluminum (mg/L)</td>
<td>0.2</td>
<td>0.6</td>
<td>0.3</td>
<td>0.582</td>
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<td>Copper (mg/L)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
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<tr>
<td>Iron (mg/L)</td>
<td>0.2</td>
<td>1.0</td>
<td>0.6</td>
<td>1.815</td>
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<tr>
<td>Manganese (mg/L)</td>
<td>ND</td>
<td>0.1</td>
<td>ND</td>
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</tr>
<tr>
<td>Lead (mg/L)</td>
<td>report MDLs</td>
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<td>ND</td>
<td>Report</td>
</tr>
<tr>
<td>Zinc (mg/L)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
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</tr>
<tr>
<td>FOG (mg/L)</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
<td>15</td>
</tr>
<tr>
<td>Color (Pt-Co U.)</td>
<td>64</td>
<td>710</td>
<td>183</td>
<td>91</td>
</tr>
</tbody>
</table>

(1) NH3-N limit applies May 1 to October 31
(2) NH3-N limit applies November 1 to April 31

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Design</th>
<th>Pilot Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>BVF Organic Loading Rate, Avg</td>
<td>(kg COD/m³-d)</td>
<td>0.37</td>
<td>0.51</td>
</tr>
<tr>
<td>BVF Organic Loading Rate, 3-Day Peak</td>
<td>(kg COD/m³-d)</td>
<td>0.83</td>
<td>1.37</td>
</tr>
<tr>
<td>BVF Hydraulic Retention Time, Avg (d)</td>
<td></td>
<td>21.4</td>
<td>17.3</td>
</tr>
<tr>
<td>BVF Hydraulic Retention Time, 3-Day Peak (d)</td>
<td></td>
<td>7.8</td>
<td>---</td>
</tr>
<tr>
<td>MBR Membrane Flux Rate, Avg (m³/m²-d)*</td>
<td></td>
<td>0.27</td>
<td>0.38</td>
</tr>
<tr>
<td>MBR Membrane Flux Rate, Peak (m³/m²-d)</td>
<td></td>
<td>0.36</td>
<td>---</td>
</tr>
<tr>
<td>MBR Hydraulic Retention Time, Avg (hr)*</td>
<td></td>
<td>14.2</td>
<td>12.5</td>
</tr>
</tbody>
</table>
Theoretical production rates. The average influent sulfate (SO\textsubscript{4}) concentration was 13 mg/L, which resulted in an average biogas SO\textsubscript{4} concentration of 400 parts per million by volume. Average carbon dioxide (CO\textsubscript{2}) and methane (CH\textsubscript{4}) content of the biogas were 31.3 and 68.7 percent, respectively.

- No anaerobic solid wasting occurred during the pilot test; therefore, the calculated yield was 0.015 kg VSS/kg COD. The calculated aerobic solids yield was 0.14 kg VSS/kg COD, and wasting only occurred through sample collection. In the full-scale system, aerobic solids will be wasted to the anaerobic reactor for digestion, and the low system yield will require infrequent wasting to disposal.

**Unexpected Considerations**
The pilot testing revealed several unexpected considerations:
- The wastewater contained significant TDS concentrations throughout the testing; however, a majority appeared to be susceptible to degradation at long SRTs. The exception was the KOH used during peach processing, which was not removed by either system.
- Although both systems removed significant amounts of color, it was not enough to meet the stringent permit limit (91 Pt-Co U).

To address the concerns of TDS and color limits, the full-scale design incorporates a large influent equalization system upstream of the biological systems. This equalization will likely dampen the influent color and TDS loads and decrease the probability that supplemental color and/or TDS removal will be necessary. Additionally, the regulating agency has allowed a grace period after WWTP start-up for collection of three years of monitoring data before any effluent polishing for TDS and color would be potentially required.

**CONCLUSIONS**

Based on the results of the pilot testing, the cooperative selected the ANA+AER MBR as the preferred technology due to its robust nature and consistent performance. Although not a deciding factor, the generation of biogas in the system has allowed the cooperative to capitalize on green energy credits by installing a combined heat and power system. This will also allow the cooperative to divert some of the other fruit waste streams from offsite disposal to the anaerobic reactor to increase biogas production.

Ultimately, pilot testing provided the following value to the cooperative:
- Increased understanding of the influent wastewater characteristics.
- Demonstrated the operation of the two treatment systems to the operations staff and gave them confidence in the selected system.
- Revealed several unexpected design considerations, including color and TDS treatment requirements.
- Refined system design criteria and ensured appropriate sizing without requiring overly conservative design safety factors.
- Opened the door to an alternative energy source and a beneficial use for a portion of another waste stream.
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Finding Strength in Numbers
The Water Advocates website makes it easier to get involved in water-related legislation and regulations

The Water Environment Federation (WEF; Alexandria, Va.) has launched a new website and online grassroots advocacy tool for the Water Advocates program that features important legislative and regulatory matters and calls-to-action on issues impacting the water sector.

The website offers a number of free grassroots tools to help WEF members engage with their elected officials. Although the website is accessible to all water professionals, WEF invites members to join the Water Advocates program to increase their effectiveness in advocating for the water sector. WEF members can join the Water Advocates community on wefcom.org, as well as the Water Advocates website.

Automated letter writing to congress
The Water Advocates website currently has two calls-to-action on significant bills pending in Congress that connect users to a “Write your Congressman” tool on the website. The tool electronically submits pre-drafted letters to Senators and Representatives. The tool uses the official Congressional correspondence

Save the Date: WaterWeek 2017
Mark your calendars! WaterWeek 2017 is happening in Washington, D.C., on March 20-25, 2017. At WaterWeek, the National Water Policy Forum, Fly-In, and Expo will be hosted by WEF, NACWA, WE&RF, and WateReuse from Tuesday, March 21, through Thursday, March 23. Other partner organizations such as AWWA and WWEMA are also hosting their annual fly-ins the same week.
process so the emailed letter will not get marked as spam.

The first call-to-action urges the House and Senate to increase funding for water infrastructure in FY2017 appropriations bills. The letter asks Congress to fund the Clean Water and Drinking Water State Revolving Fund (SRF) programs at $2 billion each. In addition, the letter includes a link to a new report by WEF and the WaterReuse Association that states that for every $1 million in SRF funding, $930,000 is returned to the federal treasury in tax revenues, 16.5 high-paying jobs are created, and $2.95 million in economic growth is generated in the U.S. economy.

The second call-to-action urges the Senate to pass the Water Resources Development Act of 2016 (WRDA). The Senate version of this bill includes a number of important policy and funding provisions that benefit water infrastructure investment. The bill was passed out of committee earlier this year, but now needs to go to the Senate floor. The draft letter asks Senators to urge Senate Majority Leader McConnell to bring the WRDA bill to the floor and pass it with the water infrastructure provisions.

Sign-up for This Week in Washington

If you’d like to get all the latest news from Washington, D.C., and elsewhere around the country on important legislation, regulations, legal action, and national policies and programs, sign up for WEF’s weekly government affairs e-newsletter, This Week in Washington.

Every Friday afternoon you will receive a brief report on important issues affecting the water sector as well as upcoming events, webcasts, and publications. And best of all, it’s free to subscribe. Sign up at http://www.wef.org/GovernmentAffairs/ThisWeekInWashington/.

Grassroots Advocacy Toolkit

Members and member associations have another toolkit for their grassroots advocacy efforts. This toolkit explains the benefits of grassroots advocacy at the federal, state, and local levels, and provides advice and guidance on how to engage with elected officials and the public on important issues affecting the water sector. The toolkit outlines essential steps to grassroots advocacy, as well as provides quick tips on calling, writing, and meeting with elected officials. Also, the toolkit includes useful links to Congressional and federal agency websites and directories.

WEF members can download the PDF version of the toolkit at the Water Advocates website. Member associations are urged to share it with members as a resource.

Since 2011 Steve Dye has served as Legislative Director for the Water Environment Federation (WEF). In his government relations role Steve represents the Federation before Congress, monitors key legislation and federal policies, develops and executes legislative strategies and proposals, and maintains WEF’s excellent reputations before public and private interests in the water sector. He also leads WEF’s Water Advocates Program, a grassroots program designed to mobilize and train WEF members to advocate before federal, state, and local officials.

The information provided in this article is designed to be educational. It is not intended to provide any type of professional advice including without limitation legal, accounting, or engineering. Your use of the information provided here is voluntary and should be based on your own evaluation and analysis of its accuracy, appropriateness for your use, and any potential risks of using the information. The Water Environment Federation (WEF), author and the publisher of this article assume no liability of any kind with respect to the accuracy or completeness of the contents and specifically disclaim any implied warranties of merchantability or fitness of use for a particular purpose. Any references included are provided for informational purposes only and do not constitute endorsement of any sources.
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Did you know, 51% of millennials would rather have no job, than a job they hate? This makes hiring millennials and retaining them extremely difficult. Most supervisors and managers are considered baby boomers who have a difficult time relating to millennials and perceive them to be insubordinate. The Lunch and Learn covered strategies on how to manage expectations, mentor younger employees, and increase retention among millennials.

The Saratoga Institute surveyed over 20,000 employees over 17 industries and determined that poor leadership causes greater than 60% of turnover in the workforce. The presentation discussed best practices that can be utilized by management and supervisors to ensure their employees are happy, engaged and given the opportunity to improve skills.

NVRAC is hoping to increase participation by all water and wastewater professionals in the Northern Virginia region. For more information about the committee, please contact Thom Lipinski at tlipinski@loudounwater.org.
The Blue Ridge Brawlers of the Virginia Water Environment Association pulled off a dramatic win on Tuesday, September 27 at the 29th annual Operations Challenge competition. The fun-filled, high-energy event took place at WEFTEC 2016, the Water Environment Federation’s 89th annual technical exhibition and conference, in New Orleans, Louisiana.

First place Division 1 team members Randy Williams (coach), Lacy Burnette (captain), Wayne Brown, Stephen Lofaro, and Kevin Thomasson, and first place Division 2 team members Orren West (coach), Kelsey Gedge (captain), Matt Duncan, Lance Wenholz, and Josh Mallory, competed against 40 hard-working teams from the U.S., Canada, and Argentina. Both teams are first-time winners at WEFTEC.

As one of the most engaging events on the exhibition floor, Operations Challenge is a unique and fast-paced test of the essential skills needed to operate and maintain wastewater treatment facilities, their collection systems, and laboratories – all vital to the protection of public health and the environment.

Over the course of nearly three decades, Operations Challenge has steadily grown from the original 22-team event to this year’s 42-team, two-division format. Teams are judged on the best combination of precision, speed, and safety. The winners are determined by a weighted point system for five events including collection systems, laboratory, maintenance, safety, and process control, which was enhanced this year by new modeling software from Hydromantis.

A big congratulations to the Blue Ridge Brawlers!

“As one of the most engaging events on the exhibition floor, Operations Challenge is a unique and fast-paced test of the essential skills needed to operate and maintain wastewater treatment facilities, their collection systems, and laboratories – all vital to the protection of public health and the environment.”
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Do you work in the pretreatment field or work with pretreatment professionals? Are you on the industrial end and wonder why your pretreatment contact is worried about a particular item? Do you feel like the pretreatment world has evolved to cover a wide array of topics? We in the Industrial Waste & Pretreatment Committee feel this way, and want you to know you are not alone. Please join us on March 6-7, 2017 at the Omni Charlottesville for the Industrial Waste & Pretreatment Conference. This year we will focus on “The Many Hats of the Pretreatment World.”

On Monday, March 6 there will be a four-hour training workshop which will include discussions on Categorical Standards, Permitting as a Shield, Local Limits, and more. On Tuesday, March 7 updates from EPA and DEQ will be provided along with presentations on: wipes, alternatives to high strength waste treatment, PCB TMDLs and Strengthening Sewer Use Ordinances. Presentations by NACWA and other industry professionals are expected to be given as well. Though the agenda is still taking shape, there will be plenty of educational opportunities and information exchanges to help expand or refresh one’s knowledge base. Please check the VWEA website for the most up-to-date information on the agenda and registration.

If you would like to get involved with the committee, please contact Chris Carlough at ccarlough@hrsd.com.
It was a beautiful week to come and learn about One Water! Several new and previous attendees joined us and enjoyed the great conference which had a record 1,607 registrants, including 277 first-time attendees.

Pre-conference activities started on Sunday with the Water Taste Test. The Water Taste Test was held on the boardwalk just behind the wine festival by the Neptune Statue and was a great success. In a blind taste test, Virginia Beach Department of Public Utilities tap water was the preferred choice.

On Monday, 44 people enjoyed one of two workshops available including Lab Practices and Wateropolis. At the same time over 120 golfers enjoyed perfect weather at the WaterJAM golf tournament held at the Signature at West Neck. While some attended workshops or golfed more than 24 people practiced their marksmanship at the clay shoot held at Old Forge Sporting Clays. This year was also the first year the YP Service Event has held on a Monday. The event was a joint-partnership between the Young Professionals Committee, the Elizabeth River Project, and HRSD. Over 40 participants helped plant oyster beds in the Elizabeth River. After the golf, clay shoot, workshops, and service event, everyone headed over to the Meet & Greet at the Hilton. Over 350 attendees came out for food, drink and camaraderie, and set the stage for an exciting week.

Tuesday began with the 5K WFP Fun Run and walk along the Virginia Beach boardwalk. There were a total of 34 runners (see 5K WFP Fun Run/Walk article for more details). Following the 5K was the Orientation Breakfast. The highlight of the breakfast was the JAM-Pardy game show pitting three sets of WaterJAM committee members and former co-chairs against one another on JAM trivia. The orientation breakfast set the stage for the Opening Session which opened with Will Sessoms, the mayor of the City of Virginia Beach, followed by our Feature Speaker, Ted Henifin, with the Hampton Roads Sanitation District (HRSD) who supported our theme of One Water! with an introduction to HRSD’s Sustainable Water Initiative for Tomorrow (SWIFT). The Keynote Speaker, Ph.D. student Siddhartha Roy of Virginia Tech, gave a powerful presentation on the efforts of the Flint Water Study team related to the Flint Water Crisis, which reminded everyone of the importance of our industry and the need for transparency and a focus on protecting public health. Our keynote was followed by updates from the association-level representatives from
AWWA and WEF, Jeanne Bennett-Bailey and Lynn Broaddus, respectively.

The Exhibit Hall opened after the keynote sessions and was a huge attraction as always. Cornhole continues to be a staple in the Exhibit Hall and many attendees were able to interact with exhibitors to learn more about the latest trends in our industry. Technical sessions began on Tuesday afternoon and lasted through Thursday. Hundreds of attendees listened to top-notch technical presentations divided into 39 sessions addressing many aspects of our industry. The YP Workshop on Tuesday afternoon, Hot Topics, was also a huge hit and YPs were able to learn from industry experts on a variety of interesting topics.

Two new events debuted at JAM this year: SWAG and Junior JAM. The Sewer and Water Art Gallery (SWAG) showcased strange and unusual things found in the field by member utilities, consultants and contractors. People were given the opportunity to cast votes for the most interesting item. First place went to Newport News Waterworks for a service connection log book from the early 1900s, second place was awarded to the City of Virginia Beach Department of Public Utilities for PVC bored into during gas line installation, and third place went to the Chesapeake Department of Public Utilities for a “mystery item.” Junior JAM organizers invited students in grades 6 to 8 to visit WaterJAM and get a tour of the exhibit hall with exhibitor demonstrations of their products. Although there were only three students in attendance along with their mothers, brothers and sisters, everyone had a great time learning about the water industry. There is more information and a message from one of the parents in a subsequent article.

WaterJAM struck big at the Awards Banquet and Fun Night. A wonderful dinner with friends and colleagues started with Scott Dewhirst and John McGettigan (our VA AWWA and VWEA chair and president) and was tapped off with
a number of awards. At the conclusion of the awards, Fun Night started with a grand opening of fun on the WaterJAM cruise ship. Just like any cruise liner there were great games like shuffleboard, life-size Jenga, and casino games.

Thursday finished the conference with a number of additional technical presentations followed by facility tours at the HRSD Nansemond Treatment Plant and City of Norfolk’s 37th Street Water Treatment Plant. Also on Thursday afternoon was the third annual Stormwater Workshop. In addition, behind the scenes, the WaterJAM committee met after the conference to start planning for 2017 to be held in Hampton, VA.

On behalf of this year’s WaterJAM Committee, we’d like to thank all attendees for coming to learn more about One Water in Virginia Beach and we hope it was worth your valuable time and resources. We look forward to seeing everyone in 2017 in Hampton.

Your WaterJAM 2016 Co-Chairs,

Stewart Lassiter and Phill Yi

Junior JAM

As part of their outreach efforts to K-12 students, the Work for Water Committee hosted Junior JAM. Local middle school students (6th to 8th grade) were invited to visit JAM on Wednesday afternoon to learn more about career opportunities in the water industry, get a tour of the exhibit hall with select exhibitor demonstrations of their products, and watch the Rapid ‘Tappin’ competition. Attendance was only three students in this inaugural year, along with their moms and siblings, but everyone had a great time learning about the water industry. We received a very gracious thank-you from one of the participant’s mothers (see below) and look forward to growing this event next year.

“We had a great time today… Jed spent time talking to his mom and sister about the afternoon and quizzed them on what that small black plastic thing was (the bug condo, hahahaha). My daughter shared everything with her brothers and showed her certificate to them. I posted on homeschool site what a great time it was and how they needed to plan on going next year! Thanks again. So happy we came. Everyone was so gracious and willing to share, you three hosts were incredible! We felt so welcome in a water world we had no clue about. Have a great week!”
This year marked the first Sewer and Water Art Gallery (SWAG) at WaterJAM and it was a huge success! Sixteen items from seven municipalities/agencies in Virginia were on display for conference attendees to view and learn about, including a mystery item which was only guessed correctly by six people out of the hundreds who came through the exhibit. A wide variety of visitors, from seasoned professionals to students, were asked to vote for their three favorite items on display. Congratulations to Newport News Waterworks for their first-place entry of a Service Connection Book dating to before 1900. Second place went to Virginia Beach Public Utilities with an interesting sewer cross-bored with a gas line, and third place went to the mystery item from Chesapeake Public Utilities which was filter media collected from a residential faucet. Thanks to the other agencies that contributed items including HRSD, James City Service Authority, New Kent County Public Utilities, and Norfolk Department of Utilities. We look forward to collecting and displaying a new batch of SWAG items for WaterJAM next year! (Contact Danny Maas at DMaas@BrwnCal.com if you have an item to contribute.)

**FIRST PLACE:**
Service Connection Book, Newport News Waterworks (Formerly Newport News Light and Water)

---

On early Monday morning, a little after sunrise, you could hear it building. If you listened for it, between the soft pulses of the sprinklers and the over the low hum of the lawn mowers you could hear it. It was the sound of excitement in the air at the Signature at West Neck golf course. Over 120 golfers decided the most exciting way to kick off their 2016 WaterJAM experience was with a great round of golf on a beautiful sunny day in Virginia Beach – and no one was disappointed with their decision. For the second year in a row, a beautiful late summer day provided the perfect backdrop for a wonderful day of golf, laughter, friendly competition and benevolent giving. Thanks to this great group of participants, as well as our volunteers, over $4,000 was raised through the golf tournament for Water For People.

As is customary, the day started with a relaxed continental breakfast and some time for practice. With coffee and juice in hand, many headed over to the driving range to loosen up and plan their strategy for the day. For some, the strategy was figuring out how best to play Signature in a slight breeze with soft greens, while others contemplated how many mulligans they could use on the first tee and how best to manage their game between adult beverage stops. However, all were pondering if putting on a silly costume and posing for a picture out on the course would really be worth an extra 50-yard advantage on the tee. Trust us, it was!

The field was a complete mix of foursomes with great golfers and duffers, alike. Though everyone was having fun on the course, the pace of play was smart and after the golf ended, the laughter and friendly competition continued through lunch, which was the perfect time to present WaterJAM Water For People Golf Tournament a Huge Success!

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the day’s awards. No matter their skill level, many took home awards and prizes either from course competitions or from the fundraising prize raffle benefitting Water For People. The course contests included awards for team lowest score in each of three flights and individual awards for hitting it closest to the pin on the par three holes (and a few of those winners were a complete shocker to many in attendance) and bombing the longest drive on a par five hole.

A big thanks goes out to all of the very generous corporate sponsors that donated many of the raffle prizes and to our volunteers that made the day’s events fun. The WaterJAM Water For People Golf Tournament is a perennial favorite of all participants, and this year was no different.

On Monday afternoon as the sun lowered in the sky, if you listened, over the low hum of the golf carts being garaged, you could still hear it, the sound of excitement.

Forty-four VWEA and VA AWWA members participated in the WaterJAM 2016 Clay Shoot held at Old Forge Sporting Clays in Providence Forge on September 12. This is the finest sporting clays facility in Virginia, and we were once again treated to 100 challenging targets, delicious food, and an overall great time together.

Team Champion honors were grabbed by Greeley and Hansen #2 (Roger Cronin, Jeff Sullard, Ed Overman, and Tom Alford) while Tencarva Machinery Company (Tom Thomas, Matt Longshore, Richard Kinchloe, and Taylor Morris) claimed second place honors. The third place team was CHA Consulting, Inc. (Doug Hudgins, Steve Clary, Jamie Hall, Ryan Hendrix, Justin Pruitt and Mike Ward).

Greg Everhart was the Shoot Champion with a score of 76 and Jeff Sullard placed second with a score of 65. Ed Overman and Bryce Carter shared third place honors, both breaking 64 targets. Unlike golf, the highest score wins in sporting clays.

Everyone enjoyed a fine lunch of BBQ sandwiches and seafood gumbo followed by the awards ceremony. As always, each shooter went home with a door prize for participating.

We were able to include a grand prize drawing again this year. Quinton Nottingham was the envy of the shoot as the lucky winner of a RTIC Cooler.

Special thanks to Roger Cronin and George Guhse of Greeley and Hansen for their continued support, bringing 13 shooters to the event.

We are already making plans for next year at Water JAM 2017 and hope you can join us for another great day of shooting.
Water For People WaterJAM 5K Fun Run/Walk

By Michael Demko

Thirty-four runners made it to the starting line of the 2016 Water For People WaterJAM 5K Fun Run/Walk at the King Neptune Statue on the boardwalk. The runners checked in and received some last-minute instructions from the volunteer organizers Jamie Bondurant (Hazen and Sawyer), Andrea Edgerton (Hazen and Sawyer), John Millspaugh (Arcadis), and Alan Roberson (Corona Environmental Consulting). Prior to the run, the participants stretched and enjoyed some refreshments and free reusable water bottles while enjoying the sunrise over the ocean.

Last year’s champ, Brandon Matthews (Ferguson Enterprises), was back to defend his crown. As was the former four-time champ Mike Demko (CDM Smith). Promptly at 7:00 a.m. the run started and Brandon was off like a bolt of lightning. Mike tried to keep up but was distanced within a few strides. Within the first half mile, Mike was passed by first-timer Amanda Scott (GE) who had her eyes on tracking down Brandon.

The runners ran down the boardwalk to 10th Street where Andrea Edgerton directed them to turn around a cone and took some photos. At this point Brandon was in the lead with Amanda close in second and Mike well behind followed closely by David Wilkes (O’Brien and Gere) in fourth.

Amanda was gaining on Brandon on the home stretch, but his speed was too much and he took the win at 17:11 to her 17:20. Mike finished third at 19:05, followed by David at 19:32. Adriano Vieira (SUEZ) was the second place woman in 23:29.

For their efforts Brandon and Amanda took home $25 Running Etc. gift certificates. Kathryn Bourke (Kimley Horn) and Katherine Linares (HRSD) were the lucky raffle winners of the $50 Dick’s Sporting Goods gift cards. All the runners that registered by the WaterJAM early registration deadline took home custom race technical shirts. All finishers also received finisher’s flags to display on their name badges for the conference.

The Fun Run/Walk raised over $2100 for Water For People. Water For People works to share the heartfelt vision of a world where all people have access to clean water, adequate sanitation, and basic health services.

Water For People works with people and partners to develop innovative and long-lasting solutions to the water, sanitation, and hygiene problems in developing nations all over the world. The Virginia Chapter of Water For People hosts many events throughout the year to promote awareness and working together towards a common goal of clean water for all. To learn more about Water For People please visit, www.waterforpeople.org.

Thank you so much to all volunteers, sponsors, and participants of this year’s 5K fun run. We couldn’t have done it without you! We are looking forward to seeing you at next year’s WaterJAM 5K in Hampton.
YP Service Event

The Young Professionals Committee hosts a Service Event every year during WaterJAM. This year, we teamed with the Elizabeth River Project and HRSD to install an oyster reef in the Elizabeth River near Norfolk, Virginia. The oyster reef is part of the Elizabeth River Project’s goal for the Eastern Branch to engage the community in environmental stewardship, increase public awareness of this section of the river, and take a step towards restoring 10 acres of native oysters.

These specially designed concrete blocks or oyster bergs were constructed before the day of the service event by both the Elizabeth River Project and HRSD. They have four “legs” and a central hole that, when placed in rows on top of each other, interlock and create sturdy structure of bergs for the baby oysters to latch on to. Those participating in the YP Service Event would help install the last 200 bergs as part of Elizabeth River’s Project’s ongoing restoration efforts.

The day of the service event, over 40 volunteers helped unload the oyster bergs from the trucks, move them closer to the water, and wore their rain boots and waders to help install the oyster bergs in the water. A majority of those volunteers were those attending the WaterJAM conference later that week, including young professionals, students from universities, those working in local engineering firms, the AWWA president, the VWEA president, HRSD, and the Elizabeth River Project. This collaborative volunteer effort was a fun, unique, hands-on opportunity and a great way to spend the afternoon outdoors to help restore a natural habitat.
VWEA WaterJAM is a Certified Virginia Green Event Two Years Running

By Christel Dyer, Stephanie Spalding and Matthias Wittenberg

The VWEA WaterJAM Conference achieved the distinction as a certified Virginia Green Event for the second year in a row. The 2016 WaterJAM Planning Committee partnered with the Sustainable Utilities Committee to make this initiative a success. Items incorporated into WaterJAM that supported the certification included:

- A new and improved WaterJAM App reduced the number of printed planners.
- Online registration.
- Use of recycled paper products throughout the conference to include the planner and board inserts.
- Use of water- or soy-based ink in printing materials.
- Conference boards are designed for reuse each year.
- Conference attendees were encouraged to turn in lanyards and plastic name tag holders at the end of the conference, for re-use at future conferences.

The LEED certified Virginia Beach Conference Center provided:

- Recycling throughout the venue.
- Reusable water bottle filling stations.
- Bulk packaging of condiments where applicable.
- Disposable food service items were made out of recycled or sustainable materials.
- Uneaten food was donated to a local homeless shelter.
- Food waste was hauled off-site to N.O.P.E. (Natural Organic Process Enterprise) for composting.
- Restroom paper products were made from recycled paper.

This year there were eight recipients of the Tidy Otter Exhibitor Award, which requires exhibitors to meet a minimum number of green initiatives. The exhibitors who met these requirements and contributed to the green event include Evoqua Water Technologies, EW2 Environmental Inc., Gannett Fleming, Luck Enterprises, OBG, The Perkinson Co., Wendel, and Whitman, Requardt & Associates, LLP. Thank you to these exhibitors for your participation and for reducing your impact on the environment.

The Sustainable Utilities Committee and the 2017 WaterJAM Planning Committee welcome all additional ideas for making the next conference even more sustainable. Please send ideas to Christel Dyer, HRSD, at cdyer@hrsd.com, or contact via phone at 757-374-1332.

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Virginia Department of Environmental Quality (DEQ) Director David Paylor led the leadership of the DEQ at the Government Affairs session at WaterJAM on Tuesday September 13. Joining the director was Melanie Davenport of the Permits Division, Jutta Schneider of the Planning Division, John Kennedy of the Office of Ecology, and Jamie Bauer from the MS4 Program. Director Paylor addressed a packed room of 90-plus attendees.

Director Paylor laid out his highest priorities for DEQ in the coming years. Topping his list was the issue of unsustainable withdrawals from the Potomac Aquifer. He stated that the head available in the aquifer was dropping at a rate of 2.5 feet per year, and he believes that in 30 years irreparable damage will be done to the structure of the aquifer. Salt intrusion is becoming a serious problem. Fourteen facilities account for 90 percent of the permitted withdrawal from the aquifer. DEQ is in discussions with those facilities to limit their pumping rates. Another positive development Director Paylor mentioned was the Hampton Roads Sanitation District (HRSD) plan to treat wastewater to drinking water levels and pump that reclaimed water to recharge the aquifer. However, he believes there are technical issues to solve, such as determining the correct water quality to prevent clogging of the aquifer. He does not expect the HRSD plan to come to
fruition for 15 years. In a separate conversation, Ted Henifin, HRSD General Manager, indicated he believed HRSD’s efforts could be under way considerably faster, but scheduled to complete in the year 2030.

Director Paylor’s second priority was streamlining of the stormwater program. The last General Assembly session made modest progress on this topic. However, Director Paylor feels that much more could be done to coordinate the MS4 stormwater regulations with the Erosion and Sediment regulations. Also, there is some confusion between municipalities that have taken over the program (opt-in), those that have opted out, and jurisdictions that have taken a hybrid approach. In all cases, DEQ is supplying technical assistance to municipalities. DEQ will be working toward a legislative package to further streamline the regulations in coming General Assembly sessions. Also, a stakeholder group has been setup to consider stormwater fee structures.

The third priority on Director Paylor’s list was the Chesapeake Bay program. He stated that the wastewater sector was over performing due to facilities operating below design capacity. He also indicated that the HRSD groundwater recharge program could reduce TN discharges to the Bay by an additional 3.5 million pounds. In the short term, DEQ needs to develop the Phase 3 Watershed Implementation Plan (WIP). The agriculture and stormwater programs will receive the bulk of their attention. The Phase 3 WIP must be submitted to EPA by 2018.

Climate change was the next issue on Director Paylor’s list. Currently, DEQ is not working on a plan, as a court action is under way that could have serious implications for any state plan. However, Director Paylor stated that Virginia carbon dioxide (CO₂) emissions are down 30%. This reduction is primarily due to natural gas prices being very low leading many electric generating facilities to switch from coal to natural gas. And on another positive note, DEQ had received twenty applications for solar generating facilities. Wind facilities applications were lagging due to local concerns with viewscape and bird impacts.

Finally, Director Paylor spoke about the issues surrounding coal ash ponds. He said there were six facilities with legacy coal ash ponds. The DEQ has taken intense criticism regarding permits for dewatering these ponds. He stated that there was a lot of disinformation being circulated, particularly on social media. Of concern to almost all VPDES permit holders is the opposition to mixing zones that this subject has elicited. Director Paylor stated that DEQ would, “Stick to the law and stick to the science.” ☺
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This year at WaterJAM attendees had the opportunity to participate in a new, interactive workshop designed to provide utility organizations with a tool to engage stakeholders and help enhance community understanding and support through a demonstration of the value of water. Sponsored by the Utility Management Committee, the Wateropolis workshop is an interactive engagement experience and is modeled on the very successful North Carolina School of Government’s Budgetopolis game. Budgetopolis is an innovative and engaging tool that allows role playing as public officials are asked to make strategic, long-term budget choices, and help citizens (stakeholders) understand the complexity of the local budgeting process. Wateropolis is a water-and wastewater-specific version of Budgetopolis that allows participants to consider the expanding list of priorities and challenges that face a growing number of utility organizations throughout the United States.

The Wateropolis workshop is structured around the Effective Utility Management (EUM) framework and leads participants, who work in teams, through a myriad of issues and choices that regularly confront local utility providers such the need to make budget cuts and/or increase revenues to address various operating and capital needs. Workshop participants at WaterJAM explored many of the key issues and choices faced by 21st century utility organizations and developed an increased awareness of various stakeholder perspectives as utilities struggle to meet needs and react to changes. Wateropolis also provided participants an opportunity to increase their understanding of the value and flexibility of the Effective Utility Management Framework.

Wateropolis is a fun way to explore the complex challenges that utility organizations face and offers a meaningful educational experience that helps key stakeholders better understand the value of water. It has been successfully conducted with both large and small groups including various levels of utility staff, executive leadership, and elected officials.

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On September 15, 2016, the Virginia Water Environment Association conducted a tour of the 37th Street Water Treatment Plant as part of WaterJAM’s weeklong program. The plant receives its water from a number of reservoirs in the western portions of the Hampton Roads and provides treated water to the majority of Norfolk and portions of Chesapeake.

Ryan Maslyn, with the City of Norfolk, and Doug Noffsinger with CH2M, led the tour of the newly constructed filter building. The tour included the modifications to the sedimentation basin clear well and intermediate pump station, the new settled water pump station, and the new UV disinfection building. Close coordination and extensive planning with design team and plant personnel has been crucial in maintaining minimum finished water supply throughout construction of the project, which has a projected completion date of December 2016.

“Space limitations at the plant site, construction sequencing and maintenance of plant operations during construction were amongst the biggest challenges and PC Construction was very collaborative in working through them and helping us meet our goals and get the plant ready for this tour,” said Maslyn.

The $25 million project, which was designed by CH2M and is under construction by PC Construction, will enhance water quality by implementing new deep-bed filtration and UV disinfection. This is only the third implementation of UV disinfection technology in the Commonwealth of Virginia.
The VWEA Stormwater Committee hosted its third JAM workshop on September 15 at the Virginia Beach Convention Center. Established in 2012, the Stormwater Committee’s primary mission is to help educate the public about stormwater issues and regulations while facilitating the exchange of knowledge and experience among stormwater professionals throughout the Commonwealth. This year’s workshop, attended by MS4 managers, industry environmental personnel, and consultants, was titled, The “Other” Stormwater: Managing Industrial Runoff. The workshop focused on stormwater challenges facing industrial facilities in Virginia as well as MS4s with high priority facilities within their boundaries. Attendees were provided an overview of industrial permitting by VDEQ’s Allan Brokenbrough (Manager, Office of VPDES Permits) followed by presentations from two panels of VPDES permittees and MS4s, including:

**PANEL I – INDUSTRIAL STORMWATER PERMITTEES**

Kyle F. Madden, Environmental Engineer, Newport News Shipbuilding  
Brian M. Powell, Senior Water Program Manager, Naval Facilities Engineering Command (NAVFAC)  
Jason P. Ericson, Environmental Projects Advisor, Dominion Environmental Services

**PANEL II – MS4S**

Joseph Battiata, Stormwater Program Manager, City of Hopewell  
Scott Flanigan, Water Quality Manager, Chesterfield County

The presentations detailed ongoing compliance challenges and initiatives related to industrial stormwater. The remaining segments of the workshop were dedicated to open discussion by all attendees and presenters.

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The Student Activities Committee is a joint committee between VWEA and VA AWWA. Members of both organizations should be so proud of the work you all have done to make possible the following wonderful activities and accomplishments of our students, our future, in Virginia.

VWEA Student Design Competition
Three teams met in Richmond on April 27, 2016 to compete against each other in our Student Design Competition, where each team was required to present their wastewater/environmental project to a group of judges who considered the merit of their project, their knowledge on the subject, and their presentation.

Second place was awarded to VMI Team No. 2, who was awarded $500 and a plaque. VMI Team No. 1 won the event and was awarded $1,200, a plaque, and a travel grant for $5,200 to travel to WEFTEC in New Orleans this year to represent VWEA in the national competition. I am proud to announce they won 2nd place in the Environmental category at WEFTEC. Way to go VMI!!

VA AWWA Student Water Challenge
The 13th Annual Student Water Challenge was held on Wednesday, September 14 at Water-JAM 2016. This year, four teams competed to solve a city’s increased water demand issue due to redevelopment.

The teams were given the problem statement on the morning of the competition and had approximately five hours to develop a solution to the problem and present it to a panel of judges.

It was an excellent competition this year. In the end, Team Virginia Tech (VT) No. 2 received the first place award which included a cash reward of $1200, a plaque, and a traveling trophy. Team University of Virginia (UVA) received the second place award which included a cash reward of $500 and a plaque. Congratulations to both teams, and to all who participated. 😊
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<td><a href="http://www.ferguson.com/">www.ferguson.com/</a> waterworks</td>
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<tr>
<td>Franklin Miller, Inc.</td>
<td>40</td>
<td>973-535-9200</td>
<td><a href="http://www.franklinmiller.com">www.franklinmiller.com</a></td>
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<tr>
<td>Gannett Fleming, Inc.</td>
<td>53</td>
<td>703-222-3704</td>
<td><a href="http://www.gannettfleming.com">www.gannettfleming.com</a></td>
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<tr>
<td>Greeley and Hansen</td>
<td>48</td>
<td>804-355-9993</td>
<td><a href="http://www.greeley-hansen.com">www.greeley-hansen.com</a></td>
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<tr>
<td>Hazen and Sawyer</td>
<td>IFC</td>
<td>703-218-2034</td>
<td><a href="http://www.hazenandsawyer.com">www.hazenandsawyer.com</a></td>
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<tr>
<td>HDR</td>
<td>49</td>
<td>757-222-1500</td>
<td><a href="http://www.hdrinc.com">www.hdrinc.com</a></td>
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<td>Heyward Incorporated</td>
<td>IBC</td>
<td>804-965-0086</td>
<td><a href="http://www.heywardinc.com">www.heywardinc.com</a></td>
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<td>Hydro International</td>
<td>9</td>
<td>866-615-8130</td>
<td><a href="http://www.hydro-int.com">www.hydro-int.com</a></td>
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<td>InfoSense, Inc.</td>
<td>45</td>
<td>877-747-3245</td>
<td><a href="http://www.infosenseinc.com">www.infosenseinc.com</a></td>
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<td>JDV Equipment Corporation</td>
<td>53</td>
<td>973-366-6556</td>
<td><a href="http://www.jdevquipment.com">www.jdevquipment.com</a></td>
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<tr>
<td>Johnson, Mirmiran &amp; Thompson</td>
<td>50</td>
<td>757-499-1895</td>
<td><a href="http://www.jmt.com">www.jmt.com</a></td>
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<td>Kemira</td>
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<td>800-879-6353</td>
<td><a href="http://www.kemira.com">www.kemira.com</a></td>
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<td>Kerr Environmental Services Corp.</td>
<td>25</td>
<td>757-963-2008</td>
<td><a href="http://www.kerrenv.com">www.kerrenv.com</a></td>
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<tr>
<td>Kimley-Horn and Associates, Inc.</td>
<td>46</td>
<td>757-548-7300</td>
<td><a href="http://www.kimley-horn.com">www.kimley-horn.com</a></td>
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<tr>
<td>Lord &amp; Company, Inc.</td>
<td>50</td>
<td>803-802-0060</td>
<td><a href="http://www.lordandcompany.com">www.lordandcompany.com</a></td>
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<tr>
<td>Medora Corporation (SolarBee and GridBee brands)</td>
<td>19</td>
<td>866-437-8076</td>
<td><a href="http://www.medoraco.com">www.medoraco.com</a></td>
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<td>Michael Baker International, Inc.</td>
<td>53</td>
<td>757-631-5442</td>
<td><a href="http://www.mzbakerintl.com">www.mzbakerintl.com</a></td>
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<td>Mid Atlantic Storage Systems, Inc.</td>
<td>53</td>
<td>740-335-2019</td>
<td><a href="http://www.midatlanticstorage.com">www.midatlanticstorage.com</a></td>
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<td>Mott MacDonald</td>
<td>53</td>
<td>571-451-0950</td>
<td><a href="http://www.mottmac.com/">www.mottmac.com/</a> americas</td>
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<tr>
<td>O’Brien &amp; Gere</td>
<td>8</td>
<td>757-285-8116</td>
<td><a href="http://www.obg.com">www.obg.com</a></td>
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<td>Pittsburg Tank &amp; Tower Maintenance Co., Inc.</td>
<td>25</td>
<td>270-826-9000</td>
<td><a href="http://www.watertank.com">www.watertank.com</a></td>
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<td>Pollardwater</td>
<td>27</td>
<td>800-437-1146</td>
<td><a href="http://www.pollardwater.com">www.pollardwater.com</a></td>
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<td>Preload</td>
<td>26</td>
<td>631-231-8100</td>
<td><a href="http://www.preload.com">www.preload.com</a></td>
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<td>REI Consultants, Inc. (REIC Labs)</td>
<td>12</td>
<td>800-999-0105</td>
<td><a href="http://www.reiclabs.com">www.reiclabs.com</a></td>
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<td>RK&amp;K</td>
<td>32</td>
<td>800-787-3755</td>
<td><a href="http://www.rk.com">www.rk.com</a></td>
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<td>Sherwood-Logan &amp; Associates</td>
<td>OBC</td>
<td>804-560-5410</td>
<td><a href="http://www.shenwoodlogan.com">www.shenwoodlogan.com</a></td>
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<td>Smith &amp; Loveless Inc.</td>
<td>20</td>
<td>913-888-5201</td>
<td><a href="http://www.smithandloveless.com">www.smithandloveless.com</a></td>
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<td>Tencarva Machinery Company</td>
<td>37</td>
<td>336-665-1435</td>
<td><a href="http://www.tencarva.com">www.tencarva.com</a></td>
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<td>Timmons Group</td>
<td>46</td>
<td>804-200-6500</td>
<td><a href="http://www.timmons.com">www.timmons.com</a></td>
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<td>Tri-State Utilities</td>
<td>18</td>
<td>757-366-9505</td>
<td><a href="http://www.tristateutilities.com">www.tristateutilities.com</a></td>
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<td>Utility Service Co. Inc.</td>
<td>53</td>
<td>855-526-4413</td>
<td>www'utilityservice.com</td>
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<td>Wendel</td>
<td>34</td>
<td>703-299-8718</td>
<td><a href="http://www.wendelcompanies.com">www.wendelcompanies.com</a></td>
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<td>Whitman, Requardt &amp; Associates, LLP</td>
<td>4</td>
<td>804-272-8700</td>
<td><a href="http://www.waralp.com">www.waralp.com</a></td>
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<td>Wiley/Wilson</td>
<td>14</td>
<td>434-947-1901</td>
<td><a href="http://www.wileywilson.com">www.wileywilson.com</a></td>
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<td>Winschel Environmental</td>
<td>6,10</td>
<td>804-545-3115</td>
<td><a href="http://www.winenv.com">www.winenv.com</a></td>
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**Proudly representing the following Companies in Virginia**

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<thead>
<tr>
<th>Company Name</th>
<th>Products/Services</th>
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<tbody>
<tr>
<td><strong>ASA ANALYTICS</strong> - ChemScan Process Analyzers, Online Titration Systems</td>
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<tr>
<td><strong>BORGER</strong> - Rotary Lobe Pumps, Multichoppers®, Multicrusher® Sewage Grinders</td>
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<tr>
<td><strong>CAMBI</strong> - Thermal Hydrolysis for Anaerobic Digestion &amp; Energy Recovery</td>
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<tr>
<td><strong>CORNELL PUMPS</strong> - Centrifugal Water &amp; Sewage Pumps</td>
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<td><strong>CST CONSERVATEK &amp; TEMCOR</strong> - Aluminum Covers &amp; Domes</td>
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<tr>
<td><strong>DENORA</strong> - TETRA® Water and Wastewater Deep Bed Filtration Systems</td>
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<td><strong>ENVIRO MIX</strong> - Compressed Air Tank Mixing Systems</td>
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<tr>
<td><strong>EVOQUA</strong> - Daveco Products, Davis/RJE Odor Control, Envirex Products, Jet Tech, Memcor CMF, Wallace &amp; Tiernan Disinfection Equipment, Rex Traveling Water Screens</td>
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<td><strong>FILTER MAGIC</strong> - Gravity Filter Control Systems; Zero-2-Waste®</td>
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<td><strong>FORCE FLOW</strong> - Floquip Scales &amp; Chemical Management Systems</td>
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<td><strong>FORD HALL</strong> - Weir Wolf Clarifier Brush Cleaning Systems</td>
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<td><strong>GARDNER DENVER BLOWER PRODUCTS</strong> - Hoffman &amp; Lamson Multistage Centrifugal Blowers</td>
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<td><strong>GNA</strong> - Flushing Gates, Tipping Buckets &amp; Flow Regulators for CSO</td>
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<td><strong>HUBER TECHNOLOGIES</strong> - Bar Screens, Rotamat Screens, Screening Treatment, Grit Treatment, Screw Presses &amp; Tertiary Filters</td>
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<td><strong>INOVAIR</strong> - High Speed Packaged Blowers</td>
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<td><strong>JIM MYERS &amp; SONS, INC.</strong> - Flocculators, Belt Conveyors, Screw Conveyors, Slide Gates &amp; Hoppers, Inclined Plate Separators, Mega Vac Sludge Collectors</td>
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<td><strong>JOHNSON SCREENS</strong> - Passive Intake Screens, Triton Underdrains</td>
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<td><strong>KOMLINE-SANDERSON</strong> - Belt Filter Presses, Gravity Belt Thickeners, Dryers</td>
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<td><strong>MARCA B</strong> - Digester Gas Cleaning Systems</td>
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<td><strong>MARLEY</strong> - Marpak, Biotower &amp; Trickling Filter Media</td>
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<td><strong>NEFCO, INCORPORATED</strong> - Clarifier Density Current Baffles, FRP Weirs &amp; Baffles</td>
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<td><strong>NEWTERRA</strong> - MBR Package Plants</td>
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<td><strong>ONEWATER</strong> - Algaewheel Fixed Film System</td>
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<td><strong>OSTARA</strong> - Nutrient Recovery Systems</td>
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<tr>
<td><strong>PARKSON CORPORATION</strong> (Except Arlington &amp; Fairfax Counties) - DynaSand Filters, Biolac, Aquaguard &amp; RotoGuard Screens, Lamella Plate Settlers, Vapex Odor Control Systems, Solar Dryers, Equanox® Bioreactor Systems</td>
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<tr>
<td><strong>PROMINENT FLUID CONTROLS</strong> - Chemical Metering Pumps &amp; Analytical Instrumentation</td>
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<td><strong>PUTZMEISTER AMERICA</strong> - Biosolids Cake Pumping System</td>
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<td><strong>ROBUSCHI</strong> - Positive Displacement Blowers</td>
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<td><strong>SALNSNES</strong> - Solids Separation for Municipal, Commercial and Industrial Wastewater</td>
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<tr>
<td><strong>TROJAN UV</strong> - UV Disinfection and UV- Oxidation Systems for Municipal Water and Wastewater</td>
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<tr>
<td><strong>TURBLEX</strong> - Single-Stage High-Speed Centrifugal Blowers &amp; Aeration Control Systems</td>
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<td><strong>UGSI- CHEM FEED PRODUCTS</strong> - Polyblend and Encore Chemical Feed Equipment</td>
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<td><strong>VAUGHAN COMPANY, INC.</strong> - Dry-pit &amp; Submersible Chopper Pumps, Rotamix Digester &amp; Tank Mixing Systems</td>
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<td><strong>VIRTUAL POLYMER COMPOUNDS</strong> - Parshall Flumes, RFP Manholes &amp; Enclosures</td>
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<td><strong>WESTFALLIA SEPARATOR</strong> - Solid Bowl Centrifuges</td>
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<td><strong>WESTFALL</strong> - In-line Static Mixers</td>
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<td><strong>WILCO USA</strong> - EMU Submersible Pumps and Submersible Mixers</td>
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<td><strong>WORLD WATER WORKS</strong> - Demon BNR Process, IFAS/MBBR &amp; DAF Systems</td>
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<td><strong>WSG &amp; SOLUTIONS</strong> - Rex &amp; Link Belt Screens, Grit Collectors &amp; Classifiers</td>
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