NOTICE:
Correction and Clarifications in this revised Summer Newsletter

1. The Layne product LayneOx™ not properly identified - TM should be in the superscript
2. Robert Davis was appointed Director of Public Service with City of Cleveland – missing in heading
3. Dan Barr Joined ms consultants – missing in heading
4. Author - Carl Seifried, P.E., missing in Lake Erie intake article

7-20-15
WELL REHABILITATION
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WATER WELL DRILLING

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What an exciting time to be a part of the Ohio drinking water industry! The opportunities have never been greater for the industry as the challenges are constantly pushing us to new heights of performance as operators, engineers, technicians, customer service representatives, and utility managers.

Ohio, generally speaking, has abundant water resources to utilize while many other parts of the country are dealing with severe droughts. This creates an opportunity for Ohio to attract customers, both residential and commercial, to take advantage of this competitive advantage. For example, high-water use industries like water bottlers are moving production out of California to places like Pennsylvania. Why not Ohio? Is your community’s development director advertising your water resources to attract more customers? Why not? Can Ohio AWWA help with this? Let me know how and we will work together to accomplish it.

Another opportunity stems from some of the challenges in the industry. The challenges gained notoriety beginning in 2014 with the extended shutdown of Charleston, West Virginia’s water system due to a chemical spill and continuing in Ohio with shutdowns caused by harmful algae blooms (HAB) and pump or transmission main failures. The lack of drinking water for Ohioan and our neighbors caused a lot of media attention and gained national exposure. This has led to many levels of government like the Federal government, the Governor’s office, Cities, and Counties realizing how important often forgotten drinking water infrastructure is to society. This has been helpful in helping us meet the challenges also increasing in the industry. Additional funding sources, nonpoint regulations to protect against HABs, improved asset management regulations to prevent system failures, and cybersecurity enhancements are all being addressed this year. Our Water Utility Council continues to skillfully represent the Section on these subjects as they unfold. Take advantage of the increased exposure to improve your position in your community especially when dealing with the need to raise rates or disrupt the infrastructure as part of capital improvements.

Finally, there are many challenges to overcome including dealing with HABs, protecting source water against chemical spills, renewing failing infrastructure before it fails catastrophically, increasing regulations, potentially decreasing consumption, and increasing energy costs. Some are being partially addressed with legislation and regulation but all will need mitigated by the water systems themselves. Ohio AWWA has many events scheduled with training and presentations that can help deal with all of these. The preeminent opportunity will be the 2015 State Conference in Cleveland on September 15-18.

This leads me to the most important opportunity Ohio drinking water professionals have. A well-established network of professionals throughout the state who are ready and able to help in dealing with these challenges. Attend any Ohio Section AWWA event and start getting to know them. They have helped me in my career, solve problems on my projects, and feel like I am part of something bigger and more worthwhile than just a job. See you at the next Ohio Section AWWA event!

Here’s another reminder that the Ohio Section has been publishing a weekly e-newsletter called H2O in the Know. If you haven’t seen it yet, you can see back issues or subscribe by using this link: http://www.multibriefs.com/briefs/OAWWA/. Check it out!
Larry Huber was nominated Vice Chair. Larry is Manager of the City of Lima’s Utility Field Services. Larry was nominated to be Vice Chair. Larry started in Water Distribution in 1984 and moved up in the ranks to assistant supervisor. In 2005 the City of Lima combined the Water Distribution and Sewer Maintenance divisions of which he was named the Manager. Larry has been an instructor for OTCO since 1989 teaching water distribution, wastewater collections and backflow.

Larry has been an AWWA member for 28 years. He has been involved at the district level moving up the ranks to the chairs position then onto the governing board where he has been NW District Trustee for the last four years. He has been a member of the Distribution committee and the membership committee. He was privileged to receive the Operator Meritorious award for Distribution in 2006. He also has been a member of Lima’s tapping team as the copper man in the late 80s and coach the last few years.

Larry lives on a farm outside of Bluffton which he farms with his twin Terry. He is married to Judy and since he married later in life he instantly became a grandpa; he has three daughters and seven grandkids. Larry keeps busy on the farm, traveling, being involved in his church, and spending time with the grandkids.

Sierra McCreary was nominated Southeast Trustee. Sierra has 11 years of experience in the water and wastewater industry. She has been with Black & Veatch since 2005, where she is currently an Engineering Manager. Sierra is a graduate of Drexel University, with Bachelor’s and Master’s of Science degrees in Environmental Engineering. Sierra has been a member of AWWA since 2004. She began her journey with AWWA in Pennsylvania, where she received the Rising Tide Award for her service on the Conference Planning Committee and as Chair of the Young Professionals Committee. Sierra relocated to Columbus in 2010 and continued her involvement with the young professionals. She served as Chair of the Ohio section Young Professional Committee from 2011 to 2014. During that time the YP Committee revived the OSU student chapter and developed the CSU student chapter. Sierra received the Larry Valentine Recruitment Award for two consecutive years as a result of her efforts in recruiting new members to the section. She also assisted with the planning of the first joint AWWA/WEF One Water Ohio conference in 2014 as Co-Chair of the Young Professional Committee and Social Media Committee.

Sierra was born and raised in Saudi Arabia until coming to the US in 10th grade to continue her schooling. She and her husband, Nick, enjoy CrossFit, playing/working in the garden with their two year old daughter, Anya, and when she finds time to squeeze it in, Sierra breaks out the banjo.
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Twin City Water And Sewer District Development Of A Groundwater Supply And Water Treatment System

By Terry Breckenridge, Chris Savino, & Bob Curley
Layne Christensen Company, Middletown, Ohio

INTRODUCTION

In the mid-1990’s, the Twin City Water and Sewer District (Twin City) was facing a challenge that many water utility providers experience; continuing to furnish high quality finished water to their customers with an aging water treatment plant (WTP) and raw water intake structure.

Upcoming changes in water treatment regulatory requirements would necessitate an extensive upgrade to the WTP operations. A water study was conducted in the mid-1990s and it was determined that repairs and renovations to the WTP would be roughly $12,000,000 – these water source repairs would still leave Twin City with an undesirable surface water source.

The water system superintendent at that time, Mr. John Rypien, evaluated all options in order to continue providing quality, finished potable water to his customers. John’s goal was to develop a groundwater supply, but the source of the supply was not immediately obvious. It wasn’t until the mid-2000’s that a solution was formulated by Mr. Rypien and professionals from Layne Christensen’s Middletown, Ohio office. A preliminary sales call focused on Twin City’s water needs ultimately lead to a broad based project using groundwater as the source of supply. A WTP utilizing cutting-edge treatment equipment would be constructed at the new wellfield.
After the initial exploratory work was completed, the final project included three new groundwater supply wells, approximately 5,100 feet of 12-inch diameter HDPE raw water main, and a 2.5 million gallon per day (MGD) iron and manganese WTP equipped with LayneOx™ high loading rate pressure filters. Layne personnel assisted Twin City in locating a productive aquifer, developing a test drilling program to determine the aquifer’s productivity, and developing final production well design criteria.

**BACKGROUND**

**History**

Twin City is located in Tuscarawas County, in northeastern Ohio, primarily serving the villages of Dennison, Uhrichsville, and surrounding area. They currently have approximately 3,600 service taps. Twin City maintains a potable water treatment plant and distribution system, and a sewage treatment plant and collection system.

The origins of the water system are somewhat unique in that it was originally established as the Dennison Water Supply Company in the early part of the 1900’s to provide water to the steam railroads of that era, as well to the two local communities. The WTP was rebuilt in 1964. Operational issues, politics, and declining railroad use resulted in the Dennison Water Supply Company transitioning into the Twin City Water and Sewer District in 1979.

**Geology**

The new Twin City Wellfield is located in an unglaciated region of eastern Ohio. Thousands of years ago, however, as glaciers to the north in Stark County and surrounding areas retreated, vast quantities of glacial meltwater filled the ancestral Tuscarawas River valley with permeable outwash deposits. These deposits consist of sand and gravel. Together they form the Tuscarawas buried valley aquifer system from which Twin City now obtains its water supply.

Public water supply wells in the Tuscarawas buried valley aquifer have been developed with individual capacities as high as 1,500 gpm. Most of these high-producing wells, however, are located in the central part of the buried valley. Yields of select wells in the vicinity of the Twin City site on the flanks of the valley range from 250 to 1000 gpm.

Neither of the Twin Cities, Dennison nor Uhrichsville, overlie the Tuscarawas buried valley aquifer system. The aquifer system is located approximately 1.5 miles west of Uhrichsville. In addition the valley is narrow with relatively steep valley walls in this area. Test drilling was essential in order to locate a portion of the aquifer suitable for Twin City’s needs.

Funding for the project was provided by grants and loans from the Ohio EPA’s Water Supply Revolving Loan Account. The Rural Community Assistance Program (RCAP) assisted Twin City in identifying and obtaining the funding. Approximately five years passed from the initial development of the project scope until Twin City received the funding.

**FUNDING**

WE Quicksall and Associates, Inc. in New Philadelphia, Ohio was the consulting engineer for Twin City and prepared the plans and specifications for the final water system improvements. Quicksall was also the consultant during the test drilling phase of the contract.

Diagram 1: Map of area
LayneOx™

Iron and manganese occur naturally in groundwater and are particularly ubiquitous in the glacial buried valley aquifers of Ohio. Historically, direct filtration of iron and manganese was accomplished using manganese greensand. Typically, potassium permanganate or chlorine in combination with potassium permanganate is used for an oxidant.

LayneOx™ is a proprietary oxidation / filtration technology that exhibits superior catalytic properties to manganese greensand. In addition, it requires only chlorine as the primary pre-oxidant. LayneOx™ takes advantage of the fact that iron and manganese are readily oxidized in the presence of pre-oxidized manganese in the media.

The concept of Liquid Loading Rate (LLR) is essential to understanding the efficiency of a media. The LLR is the flow rate per unit area of media, expressed in gallons per minute per square foot (gpm/sf), at which a media can treat a contaminant.

The 10 State Standards adopted by Ohio and surrounding states place a limit of 3.0 gpm/sf on pressure filters for iron and manganese removal. However, these limits can be relaxed if the capability of a technology is demonstrated through pilot testing. The LLR of LayneOx™ is 6 to 12 gpm/sf, or two to four times the limit established in the 10 State Standards. Traditional green sands, including GreenSand+, are limited to 3 to 4 gpm/sf.

A highly efficient media benefits the public water purveyor by allowing them to use smaller or fewer filter media vessels than if using a traditional media. This in turn allows the purveyor to design a water treatment plant with a smaller footprint. Ultimately, this results in lower capital costs.

Other advantages of LayneOx™ over a traditional greensand media include:

- less downtime due to backwashing;
- longer running times between backwashes;
- reduced waste generation during backwash;
- no media replacement;
- resistance to degradation because of high particle hardness;
- no long reaction time required for chlorine gas, which is typically injected 10 to 30 seconds ahead of the filter inlet;
- no pink water concerns because potassium permanganate is not used; and,
- modular, skid-mounted units provide flexibility for future expansion.

While relatively new to the Ohio market, the first LayneOx™ treatment system was installed in the United States in 2003. Layne currently has over 40 such systems throughout the Midwest.

PHASE I: WELLFIELD EXPLORATION

Layne’s initial investigation involved a review of records and data relative to the groundwater availability and an evaluation of a property selected by Twin City as a potential site for a public water-supply wellfield. After consulting with Twin City, Quicksall, and Ohio EPA regulators, well site acceptance was granted for a prospective wellfield. The site was along the eastern edge of the Tuscarawas River buried valley, approximately 600 feet from the river bank. As noted earlier, the Tuscarawas River buried valley is very narrow and the limits of the permeable water bearing materials were unknown.

The initial phase of the field work for the wellfield exploration began in mid-2010. Eight test holes were drilled using a hollow-stem auger truck-mounted drilling rig. It was a concern that this site may be on the eastern flank of the buried valley and that developing a high capacity well at this location may be difficult. Subsequent testing at this site ultimately verified this.
The depth of the test holes varied from 8 to 71 feet deep. PW-1 was selected as the location for a 12- x 24-inch diameter gravel packed test pumping well, to be equipped with 15 feet of stainless steel, 80 slot (0.08-inches) screen set from 55 to 70-feet deep. It was drilled using a cable-tool drilling rig.

A step test and a 48-hour constant rate pumping test was conducted, the latter at 1,204 gallons per minute (gpm). Based on this, it was determined that PW-1 had a long term safe yield of approximately 800 gpm. PW-1 proved more than adequate from a quantity standpoint; however, high sulfates and iron concentrations made it unsuitable as a potable water well. These water quality issues were attributed to nearby quarrying operations.

PHASE II: WELLFIELD EXPLORATION

The area for the second phase of the exploratory test drilling was selected upriver and generally southwest of PW-1, closer to the Tuscarawas River and presumably closer to the center of the buried valley. The field testing was conducted in early November of 2010. Three sites were selected, all located approximately 75-feet east of the river bank in a heavily wooded portion of the floodway. Regulatory approval was obtained for these sites from Ohio EPA and the Tuscarawas County Flood Management Agency. All three sites proved promising for the development of high capacity water supply wells.

Groundwater samples were collected from the test holes following development in November 2010 using a small diameter, low flow sampling pump. The samples were analyzed by an OEPA approved laboratory for key parameters including: sulfate; alkalinity, total; calcium; manganese; pH; residue, total filterable; total organic carbon; and Langelier index. The key laboratory results were:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>SMCI (mg/l)</th>
<th>TW-9</th>
<th>TW-10</th>
<th>TW-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfates</td>
<td>mg/l</td>
<td>250</td>
<td>377</td>
<td>360</td>
<td>616</td>
</tr>
<tr>
<td>Iron</td>
<td>mg/l</td>
<td>0.3</td>
<td>1.440</td>
<td>0.960</td>
<td>2.600</td>
</tr>
<tr>
<td>Manganese</td>
<td>mg/l</td>
<td>0.05</td>
<td>0.610</td>
<td>0.666</td>
<td>0.576</td>
</tr>
<tr>
<td>pH</td>
<td>SU</td>
<td>7.0-10.5</td>
<td>7.6</td>
<td>7.61</td>
<td>7.48</td>
</tr>
</tbody>
</table>

Because the groundwater quality at all three Phase II test holes was substantially better than PW-1, and because of the potential productivity of the aquifer, it was determined to drill a test pumping well at site TW-9.

Well PW-2 was drilled approximately 15-feet from TW-9, the southernmost test well. The well is a 16-inch x 24-inch diameter gravel packed well drilled to a depth of 126-feet below grade. It is equipped with a 20-foot long stainless steel, 80 slot (0.08 inch) screen set from 106 to 126 feet below grade. The well was drilled using a cable-tool rig.

A three-hour step-drawdown and 48-hour constant-rate pumping test were conducted. The constant rate test began immediately at the end of the step test. The well was pumped at 1,808 gpm. Pertinent groundwater levels below the top of the 16-inch casing were:

<table>
<thead>
<tr>
<th>Static Water Level</th>
<th>Pumping Level</th>
<th>Drawdown</th>
<th>Water Level Above Well Screen</th>
<th>Specific Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.05 feet</td>
<td>22.85 feet</td>
<td>15.86 feet</td>
<td>82.15 feet</td>
<td>114 (gpm/ft/ drawdown)</td>
</tr>
</tbody>
</table>
Water level in PW-2 recovered to 7.66 feet below the TOC within one minute after pumping stopped (96% recovery).

Groundwater samples collected at the end of the 48-hour test were analyzed for parameters required by Ohio EPA for new public drinking wells at an Ohio EPA approved laboratory. Results for key parameters were:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Concentration (mg/l)</th>
<th>SMCI (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>2.07</td>
<td>0.3</td>
</tr>
<tr>
<td>Manganese</td>
<td>0.668</td>
<td>0.05</td>
</tr>
<tr>
<td>Sulfate</td>
<td>467</td>
<td>250</td>
</tr>
</tbody>
</table>

Based on the test pumping and water quality analysis, PW-2 (later re-designated as PW-3) was deemed more than satisfactory for a future water supply well. Given the favorable subsurface conditions, two more production wells were drilled along the Tuscarawas River.

**WELLFIELD DEVELOPMENT AND TESTING**

In 2013 Layne drilled the two additional water supply wells. The wells were drilled using a combination of bucket auger and cable tool drilling techniques. A bucket auger was used for the Twin City wells, drilled to 110 feet (production well No. 2) and 120-feet (production well No. 1) below grade, respectively. Both are equipped with 20 feet of stainless steel, 80 slot (0.08 inch) screen, set in the lower 20 feet of the well.

Four-hour step-drawdown and 24-hour constant-rate pumping tests were conducted at well Nos. 1 and 2. Pertinent test pumping and groundwater levels below the TOC were as follows:

<table>
<thead>
<tr>
<th>Well No.</th>
<th>Static Water Level (feet)</th>
<th>Flow Rate (gpm)</th>
<th>Pumping Level (ft)</th>
<th>Drawdown (feet)</th>
<th>Water Above Screen (feet)</th>
<th>Specific Capacity (gpm/ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.90</td>
<td>1.602</td>
<td>26.60</td>
<td>15.70</td>
<td>73.40</td>
<td>102</td>
</tr>
<tr>
<td>2</td>
<td>8.15</td>
<td>1,548</td>
<td>20.10</td>
<td>11.95</td>
<td>69.90</td>
<td>130</td>
</tr>
</tbody>
</table>

Groundwater samples were collected and analyzed for parameters required by Ohio EPA for new public drinking wells at an Ohio EPA approved laboratory. Results for key parameters were:

<table>
<thead>
<tr>
<th>Production Well No.</th>
<th>Parameter</th>
<th>Concentration (mg/l)</th>
<th>SMCI (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iron</td>
<td>5.66</td>
<td>0.3</td>
</tr>
<tr>
<td>1</td>
<td>Manganese</td>
<td>0.983</td>
<td>0.05</td>
</tr>
<tr>
<td>1</td>
<td>Sulfate</td>
<td>642</td>
<td>250</td>
</tr>
<tr>
<td>2</td>
<td>Iron</td>
<td>1.19</td>
<td>0.3</td>
</tr>
<tr>
<td>2</td>
<td>Manganese</td>
<td>0.763</td>
<td>0.05</td>
</tr>
<tr>
<td>2</td>
<td>Sulfate</td>
<td>372</td>
<td>250</td>
</tr>
</tbody>
</table>

All three new wells were equipped in April 2013 with 1,000 gpm well pumps, 75 hp submersible motors, and Baker pitless adaptors. All wells were completed on 15-foot tall steel towers.
PILOT TESTING

LayneOx™ was pilot tested at the Twin City Water & Sewer District (Twin City) on September 28 through October 5, 2011 in accordance with protocols approved by the Ohio EPA. The purpose of the testing was three-fold:

1) to confirm the ability of LayneOx™ media to remove iron and manganese in the well water to acceptable concentrations using a Liquid Loading Rate (LLR) higher than the established Ohio EPA standard;

2) to document this ability to the satisfaction of the Ohio EPA; and,

3) to determine the appropriate sizing of filters required for full scale treatment of the water supply.

During the testing, Layne provided the LayneOx™ media, diluted bleach (used as a pre-oxidant) and a full time technician.

Water from Test Pumping Well No. 2 was conveyed to the dedicated Layne pilot trailer using a submersible pump. The water was chlorinated immediately prior to the treatment column inside the trailer. It was pumped continuously throughout the duration of the testing, with the exception of a backwash cycle at the end of each filter run. A total of ten runs were conducted.

The LLR for the testing ranged from 6.5 gallons per minute per square foot of media (gpm/sf) to 9.7 gpm/sf. The established Ohio EPA standard for traditional greensand media is 3.0 gpm/sf.

Pilot testing results are summarized below. The LayneOx™ media removed the iron and manganese from the well water. Iron breakthrough typically ended each filter run prior to manganese breakthrough. Differential pressure buildup in the filters did not cause the end of any filter runs.

continued on page 12
The initial LLR of 9.7 gpm/sf yielded a filter run of 8.5 to 9 hours. At a LLR of 6.5 gpm/sf, a filter run between 19 to 20 hours was achieved. The differential pressure across the filter increased about 10 psi during this run, resulting in a total pressure drop throughout the system of 15 psi.

Final design parameters were based on a treatment rate of 1560 gpm. At this rate, four 108-inch diameter filters with LLRs of 6.13 gpm/sf were specified. At an LLR of 6.5 gpm/sf, the average iron effluent concentration prior to breakthrough was 0.12 mg/L. The secondary maximum contaminant level (SMCL) for this parameter is 0.30 mg/L. The average manganese effluent concentration prior to breakthrough was 0.017 mg/L, less than half the SMCL of 0.05 mg/L.

In a letter from the Ohio EPA on November 23, 2011, Twin City was permitted to use LayneOx™ with an LLR of 8.2 gpm/sf. Backwash frequencies of 20 to 24 hours were stipulated. The pilot testing was a success.

### Run # | LLR (gpm/sf) | Filter Run (hours) | Avg Fe Influent (mg/L) | Avg Fe Effluent (mg/L) | Avg Mn Influent (mg/L) | Avg Mn Effluent (mg/L) |
---|---|---|---|---|---|---|
1 | 9.7 | 8.5 | 2.3 | 0.10 | 0.605 | 0.014 |
2 | 9.7 | 9 | 1.9 | 0.10 | 0.61 | 0.010 |
3 | 8.8 | 9-10.0 | 2.3 | 0.06 | 0.64 | 0.016 |
4 | 6.5 | 19.5 | 1.7 | 0.14 | 0.62 | 0.019 |
5 | 6.5 | 19.5 | 1.9 | 0.12 | 0.64 | 0.016 |
6 | 6.5 | 20 | 2.2 | 0.10 | 0.65 | 0.015 |
7 | 9.5 | 8 | 2.7 | 0.10 | 0.66 | 0.011 |
8 | 9.5 | 8-9.0 | 2.7 | 0.09 | 0.66 | 0.011 |
9 | 9.5 | 8.5-9.0 | 2.6 | 0.10 | 0.66 | 0.012 |
10 | 8.8 | 9 | 2.7 | 0.07 | 0.66 | 0.015 |

The services of two engineering firms were used in the design phase of the Twin City project, W.E. Quicksall and Associates, Inc. (Quicksall) from New Philadelphia, Ohio, and Wilson & Company (Wilson) from Salina, Kansas.

In the early stages of the project, Twin City personnel visited an existing LayneOx™ plant in Minneapolis, Kansas designed by Wilson. During this meeting they decided that the Minneapolis plant was a perfect fit for their needs. The consultant for Twin City, Quicksall, subsequently engaged Wilson to help expedite the project. The two engineering firms worked together in developing the final plant design.

A process flow diagram of the Twin City treatment process is presented in Diagram 2. Water from the Twin City wellfield is pumped from the wells at a maximum rate of 1,560 gpm to the WTP. The plant consists of one treatment train comprised of four 108” diameter by 64” tall vertical pressure filters. Each filter contains 191 cubic feet of LayneOx™ media underlain by support gravel and an underdrain. Each unit is designed to treat 390 gpm. Ten to thirty seconds ahead of the filter inlet, chlorine gas is fed to the raw
water as a pre-oxidant in a concentration of 2.0 to 2.5 ppm in order to maintain a 0.3 to 1.0 ppm chlorine residual in the effluent.

The pre-oxidant and the LayneOx™ facilitate the oxidation of iron and manganese to the insoluble, filterable state. The site then further oxidizes the next iron and manganese ion it encounters. The media adsorbs the now insoluble iron and manganese while the spent site is re-activated by fresh incoming oxidant.

Filtering continues as the manganese dioxide and ferric hydroxide are trapped in the interstitial spaces in the media. This continues until either the manganese dioxide and/or ferric hydroxide pass into the effluent (breakthrough) or the precipitates cause head loss in the filter to unacceptable levels. At the time of this article backwashing is required every 20 to 22 hours.

The purpose of the backwash is to loosen and rid the filters of accumulated solids. It involves a high volume of water over a relatively short duration. This is accomplished by pumping a maximum of 25 gpm/sf in the up-flow mode for approximately five minutes. The in-service filters provide the backwash water. The return water is conveyed from the system to a 50,000-gallon backwash holding tank. From there it is pumped, via a force main, to the Twin City wastewater collection system.

The treated water goes from the filters to an 85,000-gallon clearwell located adjacent to the plant for discharge to the distribution system. From this point the finished water is pumped by the two high-service pumps to the system storage and distribution.

A summary of the treatment system parameters and a tabulation of the plant design parameters follows:

### Influent and Effluent Water Conditions

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Influent Concentration</th>
<th>Effluent Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron (total as Fe)</td>
<td>2.7 mg/L</td>
<td>&lt;0.15 mg/L</td>
</tr>
<tr>
<td>Manganese (as Mn)</td>
<td>0.65 mg/L</td>
<td>&lt;0.01 mg/L</td>
</tr>
<tr>
<td>pH</td>
<td>&lt;7.2</td>
<td>6.8 to 7.2</td>
</tr>
</tbody>
</table>

### Process Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Loading Rate</td>
<td>6.13 gpm/sf</td>
</tr>
<tr>
<td>Design System Flowrate</td>
<td>0 to 1560 gpm</td>
</tr>
<tr>
<td>Capacity per Filter</td>
<td>390 gpm</td>
</tr>
<tr>
<td>Normal System Flowrate</td>
<td>1560 gpm</td>
</tr>
<tr>
<td>Normal Flowrate per Filter</td>
<td>390 gpm</td>
</tr>
<tr>
<td>Backwash Flowrate</td>
<td>1590 gpm (25 gpm/sf)</td>
</tr>
<tr>
<td>Pre-Oxidant Feed Rate</td>
<td>2.0 to 2.5 ppm (variable)</td>
</tr>
<tr>
<td>LayneOx™ Media per Filter Cell</td>
<td>191 cubic feet</td>
</tr>
<tr>
<td>Maximum System Pressure</td>
<td>75 psig</td>
</tr>
<tr>
<td>System Design Head Loss</td>
<td>15 psig</td>
</tr>
<tr>
<td>Clean Bed Pressure Drop</td>
<td>5.0 psig</td>
</tr>
<tr>
<td>Maximum Differential Pressure</td>
<td>10.0 psig</td>
</tr>
<tr>
<td>Terminal Differential Pressure</td>
<td>15.0 psig</td>
</tr>
</tbody>
</table>
Construction of the Twin City project proceeded in multiple phases:

- Plans and specifications were then developed by Quicksall that for equipping all three viable wells with pumps and appurtenances, approximately 5,100 feet of 12-inch diameter HDPE raw water main, and a water treatment plant (see below).

- The four contracts that bid in May 2012 were 1) well field improvements; 2) raw water and finish water transmission line, WTF force main, and access roads; 3) WTF; and 4) booster station and county road 28 waterline. Layne was awarded Contracts 1 and 2, and provided equipment for Contract 3.

Water Treatment Plant

The modular LayneOx™ filter units were delivered, two per skid, via two flat-bed trucks in March 2013. The four pre-piped and pre-wired filters were rolled into the plant on construction-grade rollers through an overhead door to their proper position in the plant. Because of the modular design, the entire process was completed in one day.

Layne personnel then monitored the installation of the media. This was followed by piping and wiring connections to the system. Finally, Layne personnel were present and assisted during the start-up. The entire plant was completed and went online in July 2013. Since that time Twin City has enjoyed lower operating costs and a much more consistent raw water quality.

SUMMARY

The Twin City project is a wonderful example of what can happen when a water purveyor, engineers, and a contractor, Layne, come together with open minds, a new technology, and a common purpose. LayneOx™, the filter media with a superior liquid loading rate, was essential to the success of this project.

Twin City knew that their existing water source was subpar and their water treatment plant was antiquated. And although a timely solution was important, they had the foresight to begin planning for an alternative supply before it was too late. This left the door open to considering new, cost-effective, and cutting edge options.

Picture 3 Assembled LayneOx™ filters
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You are Invited to Attend!

Make plans to attend the 77th Annual Ohio Section AWWA Conference and Expo September 15 – 18, 2015, at the new Cleveland Convention Center and the Cleveland Marriott Downtown at Key Center. We hope you will take advantage of this opportunity to network with and learn from the best in Ohio’s Drinking Water community.

An excellent technical program will highlight the latest trends and accomplishments in Distribution System Management, Water Quality, Treatment Techniques, Planning and Asset Management, Research, Capital Projects, Regulatory Compliance and System Operation. A Tuesday morning water plant tour will highlight the recent capital improvements and techniques used at Cleveland Water’s Garrett A. Morgan Water Treatment facility and the Research Committee is providing a Pre-Conference Workshop on Emerging Contaminants and Alternative Treatment Methods. An expansive expo area featuring the industry’s top Consultants, Suppliers and Distributors showcasing the latest equipment and services awaits your perusal in the new Cleveland Convention Center, where you will also have the opportunity to cheer on your favorite competitors in our annual Tapping, Meter Madness, Top Ops and Water Taste Tests.

A variety of networking events await your participation and enjoyment, whether on the golf course or at the Cleveland Chop on Tuesday, the MAC Luncheon and Mixer on Wednesday or the Reception and Gala on Thursday. Our Spouses & Guests won’t be left out either as they will have the opportunity to explore a number of venues throughout the Greater Cleveland area, including the Rock and Roll Hall of Fame, Cleveland Botanical Gardens, The Cuyahoga Valley Railroad and a sightseeing tour on Lolly the Trolley, as well as some other surprises!

**PRE-CONFERENCE RESEARCH COMMITTEE WORKSHOP**

The Research Committee continues its tradition of offering a high-quality pre-conference workshop this year. This year’s focus will be on *Emerging Contaminants and Alternative Treatment Methods*. Come hear about some of the latest Research and take the opportunity to learn from your fellow water professionals in this value added workshop. The full agenda and total number of contact hours will be published on the Ohio Section AWWA website, oawwa.org when speakers have been finalized.
WATER PLANT TOUR
The Garrett A. Morgan Water Treatment Plant was originally called The Division Avenue Pumping and Filtration Plant. The facility was constructed in 1916 on the site of the original Cleveland Water System of 1856. The plant was rededicated in 1991 in honor of the inventor (Garrett A. Morgan) who successfully rescued several workers trapped by toxic fumes while digging the intake tunnel. Garrett A. Morgan WTP has an Ohio EPA approved capacity of 150 MGD. Recent renovations and upgrades include a new finished water pump station, a new 15 MG reservoir, a central chemical facility, basin chain & flight sludge collectors, residuals handling/storage, and raw water pump station improvements. The Plant Tour will be held on Tuesday, September 15. 1.5 Contact Hours have been applied for.
Transportation to and from Morgan provided Courtesy of Hazen & Sawyer.

PRE-CONFERENCE WELCOME GATHERING
It’s time to touch base with all your Water Industry friends and start the Ohio Section Annual Conference off on a social note! Come join us at The Cleveland Chop on Tuesday, September 15th from 7:00 pm – 10:00 pm for three hours of meeting and greeting old friends and new. You’ll be provided with lots of tasty hors d’oeuvres and a fun atmosphere a short walk away from the Marriott in the heart of the popular Cleveland Warehouse District. This event is expected to sell out quickly – so get your ticket to fun early! Early registration is $40 until August 15. If any spots are left open, the price will rise to $50 beginning August 16.

COMMITTEES & COUNCILS
Planning to meet at the 2015 Ohio Section Annual Conference? Reserve Your Meeting Room Now!

Committee/Council: ____________________________ Anticipated Attendance: __________________
Chair: ____________________________ Contact Info for Chair: ______________________

Please select 1st and 2nd choices for your Committee/Council Meeting

Tuesday, September 15
Wednesday, September 16
Thursday, September 17
Friday, September 18 (end by 12:00)

Preferred Time:
8:00 – 10:00
9:00 – 11:00
10:00 – 12:00
1:00 – 3:00
2:00 – 4:00
3:00 – 5:00

Deadline for requests for Council/Committee Meetings is August 15, 2015. Please return your meeting requests to Melinda Raimann at melinda_raimann@clevelandwater.com or by fax to 216-664-2378.

Planning on an Exhibit? Please submit the exhibitor registration form to reserve your space. Use your Committee/Council name as the Company Name. All requests will be filled first come, first served.
PRELIMINARY SCHEDULE

TUESDAY, September 15, 2015
8:30 am – 6:00 pm    Golf Outing – Sweetbriar Golf Course
7:00 am – 7:00 pm    Registration – Marriott
9:00 am – 12:30 pm   Morgan Plant Tour
9:30 am – 4:00 pm    Research Workshop – Marriott
3:00 pm – 5:00 pm    Exhibit Setup – Convention Center
7:00 pm – 10:00 pm   Welcome Gathering – Cleveland Chop

WEDNESDAY, September 16, 2015
7:00 am – 7:00 pm    Registration – Marriott
7:30 am – 9:30 am    Exhibit Setup – Convention Center
8:00 am – 10:00 am   Kick-Off Breakfast & Awards – Marriott
9:30 am – 4:00 pm    Spouse/Guest Program
10:00 am – 5:00 pm   Exhibit Expo Open – Convention Center
10:00 am – 5:00 pm   Tapping, Top Ops, Taste Competitions
12:30 pm – 2:00 pm   MAC Luncheon in Exhibit Hall
5:00 pm – 7:00 pm    MAC Mixer & Awards – Exhibit Hall
5:00 pm – 7:00 pm    Meter Madness

THURSDAY, September 17, 2015
7:00 am – 6:00 pm    Registration – Marriott
8:00 am – 11:45 am   Technical Sessions – Convention Center
8:00 am – 3:30 pm    Spouse/Guest Program
12:00 pm – 2:00 pm   Business Luncheon & Awards – Convention Center
2:00 pm – 4:30 pm    Technical Sessions – Convention Center
6:00 pm – 7:00 pm    Reception – Marriott
7:00 pm – 9:00 pm    Gala & Awards – Marriott

FRIDAY, September 18, 2015
7:00 am – 10:00 am   Registration – Marriott
7:00 am – 8:00 am    Awardees Breakfast – Marriott
8:00 am – 11:45 am   Technical Sessions – Marriott
9:30 am – 12:00 pm   Spouse/Guest Program
10:00 am – 12:00 pm  Governing Board Meeting – Marriott
**SPOUSES & GUESTS PROGRAM**

**WEDNESDAY, September 16, 2015**  Board Bus at 9:30 a.m., Return at approximately 4:00 p.m.
- Rock N Roll Hall of Fame
- Lunch at the House of Blues – please select your choice for lunch:
  1. *Certified Angus Beef Burger with Chef’s Choice of Cheese Served on a Potato Bun with French Fries
  2. Smoked Pulled Pork Sandwich with Smoked Tomato BBQ Sauce and Citrus Champagne Slaw, Served on a Potato Bun with French Fries
  3. Southwestern Chicken Sandwich Grilled Citrus Marinated Chicken Breast topped with Pepper Jack Cheese, Oven Roasted Tomatoes, Diced Green Chiles, Avocado Slices and Chipotle Mayo Served on a Potato Bun with French Fries
  4. Caesar Salad Whole romaine leaves sprinkled with Parmesan and Croutons Served with or without a Blackened Chicken Breast
- Lolly the Trolley Tour of Cleveland

**THURSDAY, September 17, 2015**  Board Bus at 8:00 a.m., Return at approximately 3:30 p.m.
- Cuyahoga Valley Scenic Railroad
- Lunch at the Cleveland Botanical Gardens
  1. Deli Italian Sandwich with Cappicola, Salami, Pepperoni, provolone, basil Aioli, Lettuce, Tomato on Crusty Italian Bread with chips
  2. *Smoked Turkey & Aged Cheddar Sandwich with Smoked Turkey, White Cheddar, Whole Grain mustard, Lettuce Tomato on 12 Grain Bread with chips
  3. Santa Fe Chicken Wrap with Grilled Free Range Chicken, Chipotle Spread. Cucumber, Tomato, Shredded Lettuce in Tomato Wrap with chips
  4. Grilled Vegetable Salad with Portabella Mushrooms, Zucchini, Squash, Tomatoes Grilled and bedded on Romaine Lettuce, Balsamic Vinaigrette
- Cleveland Botanical Gardens Tour

**FRIDAY, September 18, 2015**  Board Bus at 9:30 a.m., Return at approximately 11:45 a.m.
Playhouse Square Tour

*Default lunch if no selection is made

Name (please print): ____________________________________________

Phone (in case menu options change): ________________________________

Please send lunch selection to: Karen_cooney@clevelandwater.com
Phone: 216-664-2444 ext. 5709  Fax: 216-664-2378
TECHNICAL PROGRAM

Thursday, September 17, 2015 Morning Concurrent Sessions at the Cleveland Convention Center

Distribution Session
8:00 – 8:30  Akron’s Hydraulic and Water Quality Modeling Calibration through Real-Time Modeling
         Jim Cooper – ARCADIS U.S., Inc.

8:30 – 9:00  Preventing Pipeline Failures and Protecting Public Health Through Implementation of Surge Improvements
         Bo Copeland – Hazen and Sawyer, P.C.

9:00 – 9:30  Putting a Round Plug in a Square Hole
         Captain Travis M. Clower – Integrity Aquatic, LLC

9:30 – 10:00 Water Distribution Asset Inventory: An Asset Management Approach for Valves & Hydrants
         Paul Schumi – Wachs Water Services

10:00 - 10:15 BREAK

         Kristin Knight – Brown and Caldwell

10:45 – 11:15 Water Meter Replacement Project Registers Savings for Client
         Carl M. Seifried – Burgess & Niple

11:15 – 11:45 Trenchless Technology: Using Slip-Lining with Fusible PVC to Rehab a Large Diameter Water Main
         Timothy M. Antos – Burgess & Niple

Treatment Session
8:00 – 8:30  Water Treatment Plant Site Master Plan - Remember the Future
         Michael Giangiodano – CH2M Hill

8:30 – 9:00  Scale Woes
         Nichole Sajdak – Hazen and Sawyer, P.C.

9:00 – 9:30  Lake Erie Western Basin HAB Event; Fast Track Ozone Treatment Studies to Address Algal Toxin Concerns
         John L. Kane – ARCADIS U.S., Inc.

9:30 – 10:00 Residuals Handling at the Cleveland Division of Water
         Scott Moegling - Cleveland Division of Water

10:00 – 10:15 BREAK

10:15 – 10:45 Student Paper
         Student – University TBA
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:45</td>
<td>Design, Permitting and Construction of an RO Plant with a Discharge to</td>
<td>Jeremy Cook – AECOM</td>
</tr>
<tr>
<td>11:15</td>
<td>a Scenic River and State Resource Water</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lessons Learned during Toledo’s Do Not Drink Event</td>
<td>Edward A. Moore and Janet J. Schroeder – Toledo</td>
</tr>
<tr>
<td></td>
<td>Department of Public Utilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Sourcewater Session</strong></td>
<td></td>
</tr>
<tr>
<td>8:00</td>
<td>Using the Entire Monitoring Methods Tool Kit to Enhance Both Source</td>
<td>Stuart Smith – Ground Water Science</td>
</tr>
<tr>
<td>8:30</td>
<td>Water Protection and Asset Management</td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td>Yes, It’s True - Your Residuals Can Help Control Cyanobacteria Blooms</td>
<td>James DeWolfe – Hazen and Sawyer, P.C.</td>
</tr>
<tr>
<td>9:30</td>
<td>Great Miami River Streambank Stabilization</td>
<td>Jonathan Scheibly – Stantec Consulting</td>
</tr>
<tr>
<td>10:00</td>
<td>Southwestern Ohio Urban Resource Review</td>
<td>Elizabeth Downs – Butler County</td>
</tr>
<tr>
<td>10:15</td>
<td><strong>BREAK</strong></td>
<td></td>
</tr>
<tr>
<td>10:45</td>
<td>Student Paper</td>
<td>Student – University TBA</td>
</tr>
<tr>
<td>10:45</td>
<td>Watershed Management Strategies that Cost-Effectively Reduce Drinking</td>
<td>Lorraine W. Krzyzewski – Columbus Department of Public</td>
</tr>
<tr>
<td>11:15</td>
<td>Water Risks</td>
<td>Utilities</td>
</tr>
<tr>
<td>11:15</td>
<td>Getting to the Source: Reservoir Oxygenation to Control Manganese in</td>
<td>Bob Schreiner – Burgess &amp; Niple</td>
</tr>
<tr>
<td></td>
<td>Raw Water</td>
<td></td>
</tr>
</tbody>
</table>

**Thursday, September 17, 2015** Afternoon Concurrent Sessions at the Cleveland Convention Center

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:15</td>
<td>Student Paper</td>
<td>Student – University TBA</td>
</tr>
<tr>
<td>2:45</td>
<td>Operators Perspective on Preliminary Design: Day 1 Planning for Year 20</td>
<td>Gary Hopkins – Columbus Department of Public Utilities</td>
</tr>
<tr>
<td>3:15</td>
<td><strong>BREAK</strong></td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>Comprehensive Capital Improvement Program at the Toledo Water System</td>
<td>Warren Henry – Toledo Division of Water Treatment</td>
</tr>
<tr>
<td></td>
<td>Adapts to Incorporate Response to HAB’s and to Coordinate Multiple</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Projects</td>
<td></td>
</tr>
<tr>
<td>4:00</td>
<td>Cleveland Water Dead Zone Investigations</td>
<td>Maggie Rodgers – Cleveland Division of Water</td>
</tr>
<tr>
<td>4:30</td>
<td>Tiffin WTP Experience in Reducing TTHMs - Busting the Bubble for a Better</td>
<td>Thomas Schwing – Aqua Ohio</td>
</tr>
<tr>
<td></td>
<td>Solution</td>
<td></td>
</tr>
</tbody>
</table>
Utility Management Session

2:15 - 2:45  Developing a Pipeline of Leaders in Utilities
            Maiaryun Wright – RAMA Consulting Group

2:45 - 3:15  Developing a Comprehensive Asset Management Plan by Consistently Assessing
            Asset Condition, Consequence of Failure and Risk
            Kevin Slaven – ARCADIS U.S., Inc.

3:15 - 3:30  BREAK

3:30 - 4:00  Aqua Ohio Plans for the Future
            Pete Kusky – Aqua Ohio

4:00 - 4:30  No Risk, No Reward: Employing Construction Manager at Risk Project Delivery to
            Save Millions
            Todd Danielson – Avon Lake Regional Water

4:30 - 5:00  Extending the Useful Life of Underground Structures through Asset Management
            and Rehabilitation
            Kyle Schwielerman – HDR

Customer Service Session

2:15 - 3:15  How the Do Not Drink Advisory Affected Toledo’s Call Center Operations
            Abby M. Arnold – Toledo Department of Public Utilities

3:15 - 3:30  BREAK

3:30 - 4:30  Rate Making: Understanding the Process and Goals
            Glenn Marzuf – Del-Co Water Company

4:30 - 5:00  TBD
            TBD - TBD

Friday, September 18, 2015 Concurrent Sessions at the Marriott Downtown at Key Center

Regulatory Session

8:30 - 9:00  Ohio EPA Director Update
            Craig W. Butler – Ohio EPA

9:00 - 9:30  Ohio EPA DDAGW Chief Update
            Mike Baker – Ohio EPA

9:30 - 10:00 OEPA Topic
            TBD – Ohio EPA

10:00 - 10:15 BREAK

10:15 - 10:45 Air Gaps, High Rating and Emerging Technologies: How the Technology
            Committee is Trying to Make it Easier to Build a Cost-Effective Water Plant in Ohio
            Matt Steele – Columbus Department of Public Utilities

10:45 - 11:15 Identifying and Solving Lead Issues from Water Systems with Materials/Device
            Replacement in Schools and Other Buildings
            Michael R. Schock – US EPA
11:15 – 11:45 **OEPA Topic**

TBD – Ohio EPA

**Treatment Session**

9:00 – 9:30  **Balancing Treatment for DBP Precursor and Heavy Metal Removal**

Stan Zachopoulos – MWH

9:30 – 10:00  **UVICl2 Advanced Oxidation Processes for Taste and Odor Control**

James Springer – Greater Cincinnati Water Works

10:00 – 10:15  **BREAK**

10:15 – 10:45  **Optimizing Algal Toxin Removal**

Kent Bryan – CT Consultants

10:45 – 11:15  **Water Utilities Security – Lessons Learned 15 Years After 9/11**

Jose Hernandez – Cleveland Division of Water

11:15 – 11:45  **A Commitment to Customer Service and Environmental Protection: The City of Miamisburg's Plan to Implement Softening**

Christopher Hill – ARCADIS U.S., Inc

**COMPETITIONS**

**TOP OPS**

Calling all District Teams! Do you have what it takes to be crowned the Ohio Section Top Ops Champion for 2015 and go on to Chicago in 2016? The annual competition will be held on Wednesday, September 16, 2015 and will feature the winners of the summer District meeting competitions. Contact Mike Gradoville at mgradoville@aymcdonald.com or Kevin Gleich at kgleich@columbus.gov for more information.

**2015 OHIO SECTION AWWA TAPPING CONTEST**

The Ohio Section Tapping Committee would like to invite Ohio Water Utilities to send a tapping team to the Section Tapping Contest. This year’s contest will be held on Wednesday, September 16th in Cleveland. The winner of our Section contest will be given the opportunity to represent the Ohio Section at the Annual Conference & Exhibit (ACE) in Chicago, June 19 – 22, 2016.

**Tapping Contest Entry Form**

___ Men’s Tapping Contest  ___ Women’s Tapping Contest

Utility Name: ___________________________________________

Contact Name: _________________________________________

Address: ____________________________________________

City: ___________________ State: ____ Zip Code: __________

Phone: __________________ Fax: _______________________

E-mail: __________________

To register your team for this event, please complete this form (one form per team) and submit by August 17, 2015 to: Mike Gradoville  e-mail: mgradoville@aymcdonald.com

190 Newport Dr.  fax: 330-266-7622

Youngstown, OH 44512
The winners of the District Competitions at the April Southern Ohio Utility EXPO (SE & SW) and the Northern Ohio Water & Wastewater EXPO (NE & NW) have been determined. They will compete head-to-head during the District champion as they compete to represent the Ohio Section at the Annual Conference & Expo (ACE) in Chicago in June 2016.

For more information please contact Mike Gradoville at mgradoville@aymcdonald.com

**BEST OF THE BEST – Ohio Section Water Taste Test**

**Date:** Wednesday, September 16, 2015  
**Time:** Afternoon  
**Location:** Exhibit Hall, Cleveland Convention Center

**Entry forms must be received by July 31, 2015.** Water samples are to be dropped off at the Exhibit Hall between 10:00 - 11:30 AM the day of the Competition. Two samples should be brought, each in approximately a 1-liter container. The suggested container is a glass, Teflon-capped container with no air at the top. Each container must clearly identify the name of the water system. **All participants must be a Member of AWWA, with no state or federal drinking water violations (MCL, monitoring, recordkeeping, etc.) during the previous calendar year.**

<table>
<thead>
<tr>
<th>Official Water System Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water System Address</td>
<td></td>
</tr>
<tr>
<td>Contact Name</td>
<td></td>
</tr>
<tr>
<td>Contact Email</td>
<td></td>
</tr>
<tr>
<td>On Site Representative</td>
<td></td>
</tr>
<tr>
<td>and mobile phone number</td>
<td></td>
</tr>
<tr>
<td>Treatment and Source Water</td>
<td></td>
</tr>
<tr>
<td>(for informational purposes only – will not be made available to judges)</td>
<td></td>
</tr>
<tr>
<td>By signing the box to the right, you certify that the water will not be altered, and that the water will be potable for consumption</td>
<td></td>
</tr>
</tbody>
</table>

Submit entry form to Cliff Shrive at cliff.shrive@stantec.com or by fax at 513.842.8274.  
Phone 513-824-6744  Mobile 513-646-4886
# GOLF OUTING REGISTRATION

Golf Team Contact Name ____________________________________________ Title ____________________________

Company Name ___________________________________________________ Address ____________________________________________

City ____________________________ State ________________ Zip ____________ Email: ____________________________ Phone# ____________________________

**Golf Outing, Tuesday, September 15, 2015 at Sweetbriar Golf Course (Legacy & Sweetbriar Courses)**

Course will be assigned on a first come, first served basis.

<table>
<thead>
<tr>
<th></th>
<th>Early registration (By August 15)</th>
<th>Late Registration (Starting August 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team of Four Golfers</td>
<td>$360 per team</td>
<td>$400 per team</td>
</tr>
<tr>
<td>Individual Golfers</td>
<td>$90 each</td>
<td>$100 each</td>
</tr>
<tr>
<td>Hole Sponsor</td>
<td>$200 each</td>
<td></td>
</tr>
<tr>
<td>Refreshment Sponsor</td>
<td>$150 each</td>
<td></td>
</tr>
<tr>
<td>Prize Sponsor</td>
<td>$125 each</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL DUE**

---

**Golfer Names (Please print)**

1. ____________________________________________  2. ____________________________________________

3. ____________________________________________  4. ____________________________________________

5. ____________________________________________  6. ____________________________________________

7. ____________________________________________  8. ____________________________________________

---

**Form of Payment**

___ Check #_______________________________ Make Checks payable to OAWWA

___ Credit Card  [ ] Visa  [ ] Master Card  [ ] AMEX  [ ] Discover

Name on Card ____________________________________________

Credit Card Number______________________________ Expiration Date ____________ 3 digit CVV code ______

Authorized Signature_____________________________

---

**Send Registration form and payment to:**

Ohio Section AWWA  Fax: 614-221-1989

Attn: Professional Services Manager  oawwa@AssnOffices.com

17 S. High Street

Suite 200

Columbus, OH 43215

---
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pmgconsulting@bex.net

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For Northern & Central Ohio Contact: The Craun Liebing Company
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11801 CLIFTON BLVD. CLEVELAND, OH 44107
PH: 216.228.7900  FX: 216.228.7905  www.craunliebing.com

For Southern Ohio Contact: SOUTHERN SALES COMPANY
SOUTHERN SALES COMPANY
3516 GANDER DR. JEFFERSONVILLE, IN 47130

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CRAUN LIEBING COMPANY
11801 CLIFTON BLVD. CLEVELAND, OH 44107
PH: 216.228.7900  FX: 216.228.7905  www.craunliebing.com

For Southern Ohio Contact: SOUTHERN SALES COMPANY
SOUTHERN SALES COMPANY
3516 GANDER DR. JEFFERSONVILLE, IN 47130
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- Concrete Coating Applications
- New Tank Construction
- Antenna Installation
- Cathodic Protection
- Welding/Repair

**Engineering Services**
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- Specification Review
- Cathodic Protection Specifications
- Antenna Design and Review
- Tank Structural Repair Specifications
- Tank Raising and Relocation
- Tank Demolition
- Coating System Failure Analysis
- Treatment Plant Coating Specifications

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Riehl Systems Co., Middlefield OH 44062
Barry Sutphin – BERMAD – (304) 551-3504
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2015 REGISTRATION CATEGORY EXPLANATIONS

The early registration deadline is August 15, 2015. Your AWWA membership number is required on the registration form to qualify for the member rate. To obtain the retiree rate, you must be recognized as a retiree on your AWWA membership. To obtain the student rate, a current student ID is required. Your receipt will be in the registration packet at the conference.

Full Registration: This includes Technical Sessions (Thursday and Friday), the Exhibits & Educational Tours, the Kick-Off Breakfast, The MAC Luncheon and Mixer, the Business Luncheon, and the Annual Reception & Gala. The Research Committee Workshop, Plant Tour, Golf and Tuesday’s Social event are not included.

One-Day Registration (Wednesday): This includes the Kick-Off Breakfast, the Exhibits & Educational Tours, and the MAC Luncheon and Mixer.

One-Day Registration (Thursday): This includes the Technical Sessions, The Business Luncheon, and the Annual Reception & Gala.

One-Day Registration (Friday): This includes the Friday Technical Sessions.

Full Spouses/Guest Program: This includes all Spouse/Guest Activities and Tours, The Hospitality Suite, the Kick-Off Breakfast, The MAC Mixer and the Annual Reception & Gala.

Limited Spouse/Guest Program: This includes all Spouse/Guest Activities and Tours, the Hospitality Suite and the MAC Mixer. It does not include the Kick-Off Breakfast, Business Luncheon or the Annual Reception & Gala.

Research Committee Pre-Conference Workshop: This includes the technical program, lunch and break refreshments. This workshop has an additional fee and is not included in the Full Conference Registration package.

Water Plant Tour: This includes a technical tour of the Garrett Morgan Water Treatment Plant, transportation to and from the water plant, and refreshments at the plant. This tour has an additional fee and is not included in the Full Conference Registration package.

Budget Options: This includes the technical sessions for the day selected or for the entire conference (Wednesday – Friday), as well as break refreshments. It does not include any meal functions, mixers or receptions.

Exhibitor Registration: This includes Exhibit booth fees for three persons working the booth, three MAC Luncheon Tickets, three Technical registrations, six MAC Reception tickets and a $25.00 donation to Water for People. Further information is available in the Exhibitor Registration Packet.
## Attendee Registration

Submit to: Ohio Section AWWA, 17 S. High St., Suite 200, Columbus, OH 43215

<table>
<thead>
<tr>
<th>Conference Registration</th>
<th>Registration Type</th>
<th>By Aug. 15</th>
<th>Begin Aug. 16</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Conference</td>
<td>Full Conference Member</td>
<td>$295</td>
<td>$345</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Conference Nonmember</td>
<td>$395</td>
<td>$445</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Conference Retired Member</td>
<td>$200</td>
<td>$235</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Full Conference Retired Nonmember</td>
<td>$300</td>
<td>$335</td>
<td></td>
</tr>
<tr>
<td>One Day Registration – Wednesday Only</td>
<td>Weds. Only Member</td>
<td>$170</td>
<td>$195</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Weds. Only Nonmember</td>
<td>$220</td>
<td>$245</td>
<td></td>
</tr>
<tr>
<td>One Day Registration – Thursday Only:</td>
<td>Thurs. Only Member</td>
<td>$170</td>
<td>$195</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thurs. Only Nonmember</td>
<td>$220</td>
<td>$245</td>
<td></td>
</tr>
<tr>
<td>One Day Registration - Friday Only</td>
<td>Fri. Only Member</td>
<td>$90</td>
<td>$115</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fri. Only Nonmember</td>
<td>$100</td>
<td>$115</td>
<td></td>
</tr>
<tr>
<td>Full Spouse/Guest Program</td>
<td>Spouse/ Guest Program &amp; 3 Events</td>
<td>$195</td>
<td>$245</td>
<td></td>
</tr>
<tr>
<td>Ltd. Spouse/Guest Program</td>
<td>Spouse/Guest Program only</td>
<td>$140</td>
<td>$190</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extra Weds. Kick Off Breakfast Ticket</td>
<td>$40</td>
<td>$50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extra MAC Luncheon Ticket</td>
<td>$45</td>
<td>$55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extra MAC Mixer Ticket</td>
<td>$55</td>
<td>$65</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extra Business Luncheon Ticket</td>
<td>$50</td>
<td>$60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extra Thurs. Reception &amp; Gala Ticket</td>
<td>$75</td>
<td>$85</td>
<td></td>
</tr>
</tbody>
</table>

### Preconference Workshops, Events & Tours (select one if attending)

- **Research Comm. Workshop:**
  - Workshop - Member: $85, $110
  - Workshop - Nonmember: $135, $160
  - Workshop - Student (ID req'd): $45, $60

- **Water Plant Tour: 1/2 day**
  - Morgan Plant Tour: $35, $50

- **Preconference Social Event**
  - Cleveland Chop – Food & Networking: $40, $50

### Technical Program:

- **Weds. Expo & Ed. Tours Member**: $50, $75
- **Weds. Expo & Ed. Tours Nonmember**: $80, $105
- **Thurs. Tech. Sessions Member**: $75, $100
- **Thurs. Tech. Sessions Nonmember**: $110, $135
- **Fri. Tech. Session Member**: $50, $75
- **Fri. Tech. Session Nonmember**: $80, $105
- **Full Technical Program Member**: $160, $185
- **Full Technical Program Nonmember**: $190, $205
- **Full Technical Program Student**: $50, $75

### Budget Options – No Food, Beverages or Events Included

- **TOTAL AMOUNT DUE**

**Tickets will be taken for the events below:** Indicate which events you plan to attend

| ( ) Kick Off Breakfast | ( ) Business Luncheon | ( ) MAC Luncheon |
| ( ) MAC Mixer | ( ) Reception & Gala |

**Form of Payment (Payable to OAWWA)**

- ( ) Check #
- ( ) P.O. #
- ( ) Credit Card Type of Card:
- Name on Card
- #:
- Exp:
- CCV:
- Signature
SPONSORSHIP OPPORTUNITIES

Here is your opportunity to get your name, product and services cut to professionals in the water and wastewater industry in Ohio. Sponsorship of the 2015 Ohio Section AWWA Annual Conference recognizes your company as an Industry leader and entitles the Sponsor to recognition in all Conference material programs, promotional emails and mailings; recognition in both the pre-and post-conference newsletters; recognition on signage throughout the conference; recognition at the Opening Session, and on the OAWWA website.

Sponsor Levels:

( ) **$1500 Platinum** – In addition to the above listed benefits, Platinum sponsors receive recognition at the Annual Business Meeting & Luncheon and one (1) Full Conference registration

( ) **$1250 Gold** - In addition to the above listed benefits, Gold sponsors receive recognition at the Annual Business Meeting & Luncheon and one (1) free Thursday complete registration

( ) **$1000 Silver** - In addition to the above listed benefits, Silver sponsors receive one (1) free Thursday Reception & Gala registration

( ) **$750 Bronze** – Bronze sponsors receive all the benefits listed above in the opening paragraph.

A limited number of unique Premiere sponsorship opportunities are also available at a variety of levels. These sponsorships not only allow OAWWA the opportunity to offer additional events and activities during the conference, but they are also a great way for companies to showcase their individual support for OAWWA members and industry personnel.

If you are interested in one of these premier sponsorships, please contact Melinda Raimann, Conference Planning Co-Chair, at 216-664-2444 extension 5638 or by email at melinda_raimann@clevelandwater.com before sending in a Premier Sponsorship registration form or payment.

Platinum Sponsors:  

PMG Consulting, Inc.

Premier Event Sponsors:

Hazen & Sawyer

PMG Consulting, Inc.

Bronze Sponsors:

Aqua Ohio

Hazen & Sawyer
### Premier Sponsorship Opportunities

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Plant Tour Transportation &amp; Refreshments (9/15)</td>
<td>$400</td>
</tr>
<tr>
<td>Research Workshop Breaks (9/15)</td>
<td>$400</td>
</tr>
<tr>
<td>Spouse/Guest Program Suite Refreshments (9/16 – 18)</td>
<td>$600</td>
</tr>
<tr>
<td>Annual Reception &amp; Gala Decorations (9/17)</td>
<td>$1,000</td>
</tr>
<tr>
<td>Friday Break Refreshments (9/18)</td>
<td>$1,500</td>
</tr>
<tr>
<td>Golf Outing A.M. Coffee &amp; Pastries (9/15)</td>
<td>$1,800</td>
</tr>
<tr>
<td>Awardee Breakfast (9/18)</td>
<td>$2,000</td>
</tr>
<tr>
<td>Gala Entertainment (9/17)</td>
<td>$2,000</td>
</tr>
<tr>
<td>Cleveland Chop Welcome Reception Beverages (9/15)</td>
<td>$2,500</td>
</tr>
<tr>
<td>On-Site Conference Program (9/15 – 9/18)</td>
<td>$2,500</td>
</tr>
<tr>
<td>Golf Outing Lunch at the Turn (9/15)</td>
<td>$3,000</td>
</tr>
<tr>
<td>Wednesday Break Refreshments (9/16)</td>
<td>$3,500</td>
</tr>
<tr>
<td>Thursday Break Refreshments (9/17)</td>
<td>$3,500</td>
</tr>
<tr>
<td>Attendee Gift (9/15 – 9/18)</td>
<td>$7,500</td>
</tr>
<tr>
<td>Pre-Gala Reception (9/17)</td>
<td>$10,000</td>
</tr>
<tr>
<td>Thursday Breakfast (9/17)</td>
<td>$15,000</td>
</tr>
<tr>
<td>or actual</td>
<td></td>
</tr>
<tr>
<td>Friday Breakfast (9/18)</td>
<td>$15,000</td>
</tr>
<tr>
<td>or actual</td>
<td></td>
</tr>
</tbody>
</table>
**Sponsor Registration**

Please indicate your desired Sponsorship Level:

- ______ Platinum ($1,500)
- ______ Gold ($1,250)
- ______ Silver ($1,000)
- ______ Bronze ($750)
- ______ Premier
- ______ Golf Hole ($200)
- ______ Golf Refreshments ($150)
- ______ Golf Prize ($125)

**Sponsorship Total:**

____________________

**Payment information**

Please check one:

- ______ Please invoice
- ______ Enclosed in my check payable to Ohio Section AWWA
- ______ Please charge me
  - [ ] Visa
  - [ ] Master Card
  - [ ] AMEX
  - [ ] Discover

Card Number: __________________________ Exp. Date: ________________ CVV#: ______

Billing Address: ____________________________________________________________

________________________

Name on Card: ____________________________

Company: ____________________________ Contact Name: ______________________

(As you want it to appear on all promotional items)

Address: ____________________________

City: ____________________________ State: ____________________________ Zip: ______________

Phone: ____________________________ Fax: ____________________________

Email: ____________________________ Website: ____________________________

Send completed form to AWWA, 17 S. High Street, Suite 200, Columbus, OH 43215 or fax to 614-221-1989
**EXHIBITOR INFORMATION**

<table>
<thead>
<tr>
<th>Place:</th>
<th>Cleveland Convention Center, OH Telephone: 216-928-1600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours of Operation:</td>
<td>Wednesday, September 16, 2015 10:00 a.m. to 5:00 p.m.</td>
</tr>
<tr>
<td>Shipping:</td>
<td>Exhibit shipments will be received by the General Services Contractor. Information to be provided.</td>
</tr>
<tr>
<td>Set-up Hours:</td>
<td>Tuesday, September 15, 2015 3:00 p.m. to 5:00 p.m. Wednesday, September 16, 2015 7:30 a.m. to 9:30 a.m.</td>
</tr>
<tr>
<td>Exhibit Removal:</td>
<td>All exhibits must be removed Thursday, September 17, 2015 by 11:00 AM.</td>
</tr>
<tr>
<td>Booth:</td>
<td>10’X10’ Booth, carpeted with pipe &amp; drape, skirted table, two chairs, sign w/Exhibitor name.</td>
</tr>
<tr>
<td>Exhibit fee includes booth plus Exhibit day registrations, lunch, Mixer tickets and MAC social activities fee for three (3) Exhibit booth attendees, three (3) Technical conference registrations, and $25 donation to Water for People. Additional booth attendees $ 95.00 ($110 late) with items above included, $ 30 ($40 late) for limited booth attendee only. There are additional fees for electric, internet, phone, water, etc. Fees to be furnished in the exhibitor’s packet.</td>
<td></td>
</tr>
<tr>
<td>Return your check, payable to Ohio Section AWWA, with a signed contract to:</td>
<td>AWWA – Ohio Section ATTN: Emily Davis 17 S. High Street Suite 200 Columbus, OH 43215</td>
</tr>
<tr>
<td>Registration Deadline:</td>
<td>August 28, 2015</td>
</tr>
<tr>
<td>For Information:</td>
<td>Ken Rogozinski, 2015 Exhibits Chair BissNuss, Inc. Phone: 440-871-8394 Fax: 440-871-2526 <a href="mailto:krogozinski@bissnussinc.com">krogozinski@bissnussinc.com</a></td>
</tr>
<tr>
<td>All Exhibits are in conjunction with the Manufacturers/Associates Council (MAC) of the Ohio Section AWWA.</td>
<td></td>
</tr>
</tbody>
</table>
Exhibitor Agreement

The undersigned Tabletop Exhibitor (hereinafter referred to as the Exhibitor) hereby agrees to participate in the Tabletop Exhibits at the Ohio Section AWWA Conference, Wednesday, September 16, 2015 as described herein and in the Exhibitor information. The Exhibitor agrees to pay the designated Exhibitor’s registration fee of $625 postmarked by June 30, 2015, or $725 postmarked after June 30, 2015. The Exhibitor also agrees to all terms of the “Liability and Responsibility” clause, which is part of this contract. In the event that an Exhibitor wishes to cancel the contract and forfeit the exhibit space, a full refund of the registration fees will be made up to August 14, 2015. No refunds will be made after that date.

Liability and Responsibility

By signing this contract, the Exhibitor agrees to assume full liability and responsibility for any and all injuries, losses, damages, claims, or expenses (including attorney fees) arising from injury or damage to Exhibitor’s displays, equipment, and other property brought upon the Cleveland Convention Center premises. The Exhibitor shall indemnify and hold harmless the Ohio Section AWWA (OAWWA), the Cleveland Convention Center, the City of Cleveland, and the officers, agents, servants, members, and employees of each organization for any and all injuries, losses, damages, claims, and expenses.

The Exhibitor also agrees to hold harmless the OAWWA, the Cleveland Convention Center and the City of Cleveland for any and all injuries, losses, damages, claims, or expenses (including attorney fees) that may occur to the Exhibitor, the Exhibitor’s employees or property, or to any other person or property by reason of the Exhibitor’s use of the exhibition facilities prior to, during, or subsequent to the period covered by this contract and agrees to expressly release OAWWA, the Cleveland Convention Center and the City of Cleveland from such liability.

The indemnification obligation set forth shall be void as to an indemnitive, including its officers, agents, servants, members, and employees whose negligence or willful misconduct was the sole cause of the incident given rise to the injury, loss, damage, or claim. This indemnification shall not be limited in any way by limitation on the amount or type of damages, compensation, or benefits payable by or for the Exhibitor under workers compensation acts, disability benefit acts, or other employee benefit acts.

The exhibition event is scheduled from 10:00 AM to 5:00 PM on September 16, 2015. It is mutually agreed that it is the duty and responsibility of each Exhibitor to install their exhibit before the opening of the exhibition event and to dismantle their exhibit after the exhibition event closes according to the Exhibitor’s Information section contained in the prospectus. Under no circumstances shall an Exhibitor dismantle their exhibit before the closing of the exhibition event (5:00 PM on September 16, 2015) without prior permission of the Conference Exhibition Committee.

I accept the terms of this agreement. Please turn in this signed contract WITH completed exhibitor payment form on next page.

Contract acceptance signature X

Date: ___ / ___ / 15
**Exhibitor Information**

**EXHIBITOR (please print)**

Name: ___________________________ Title: ___________________________

Company: ___________________________ AWWA Member No.: _____________

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Lucinda Reichley-Yinger, Ph.D.
President
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Hybrid Design for New Lake Erie Intake Provides Cost-Effective Solution to Mitigate Environmental Concerns and Facilitate Construction

By Carl M. Seifried, PE
Burgess & Niple, Painesville, OH

INTRODUCTION

The existing 36-inch primary intake for the City of Painesville Water Treatment Plant (WTP) that originally extended 4,000 feet into Lake Erie has been plagued with problems since its completion in 1957. It was designed to replace the original 24-inch-diameter intake pipe and accommodate future growth. The intake crib was located in waters that were 20 feet deep. Fifteen years after completion, divers discovered the 36-inch prestressed concrete pipe had pulled apart and sections of pipe were dislodged due to wave action and lake turbulence. This resulted in sand deposits in the intake pipe.

This article describes the challenges overcome to obtain Federal and State permits and other considerations addressed during the planning and design of a new 36-inch Raw Water Intake System as primary raw water supply for Painesville WTP in Mentor, OH. The plant is located immediately west of Headlands Dunes State Nature Preserve. This resulted in unique environmental constraints that impacted the choice of construction methods and limited work on the shore and lake.

The new 36 inch-diameter intake pipe and crib will be constructed parallel to the existing damaged 36-inch intake. The damaged intake will be converted to a backup secondary intake to supply raw water during emergencies to the Painesville WTP Raw Water Pump Station.

HISTORY OF EXISTING INTAKES

The original 24-inch intake was constructed in 1913 and extends only 1,200 feet into the lake to a crib in 12 feet of water. The top of the intake crib lies 6 feet below lake level and is protected by a lighted buoy.

In 1951, a new 36-inch prestressed concrete cylinder pipe (PCCP) pipe intake was designed to extend approximately 4,000 feet offshore in 26 feet of water. Problems during construction caused significant delays and the project was not completed until 1957.

In 1968, a marine contractor was authorized to perform investigative and repair work on the 36-inch-diameter intake line. Inspections showed open joints and missing pipe in the vicinity of the crib. Repairing or relaying the pipe was cost prohibitive. Two sections of pipe were removed and a new 36-inch-diameter riser pipe was installed 1,500 feet off shore and converted into the new intake. The remaining damaged 2,500-foot section of pipe and intake crib was abandoned.

In ensuing years, diver inspections showed that lake-bottom sands continued to shift, requiring the riser intake to be extended by an additional two feet above the lake bottom.

Today, water is drawn from 14 feet below lake levels, creating problems with treatment of the raw water due to increased turbidity caused by rough lake conditions and wave action. In addition, northeasterly storms carried water from the mouth of the Grand River westward around the Fairport Harbor breakwall toward the Painesville intake resulting in further degradation in raw water quality. The highly turbid waters require additional chemicals for treatment. Increased operator attention was needed to produce safe finished water.
Pump tests confirmed both the 24-inch and 36-inch intakes experienced a leakage in excess of 0.5 MGD through joints.

In 2000, Burgess & Niple (B&N) was retained by the City of Painesville to prepare a Water Treatment Plant Evaluation Report for upgrading the existing plant. It was found that raw water turbidities were in excess of 10 NTUs during storm events, but averaged 2 NTUs in summer months. Recommended improvements included replacement of the raw water pumping station and construction of a new intake and crib.

As a result of the study, B&N was retained to design a new raw water pump station and screen connected to the existing intake pipe. Construction was completed in 2001 and remains in service today.

In 2011, a new study investigated alternatives to reuse and extend the line further into the lake. They were costly and the condition of the existing 36-inch intake was questionable, resulting in no action being taken due to lack of funding.

In late October 2013, the intake bar screen was damaged and had to be repaired before rough lake conditions prohibited working on Lake Erie. This would provide the City with time to evaluate its options and explore alternate funding sources that were available.

The new six-foot-diameter cylinder extended three feet above the lake bottom. Six-inch-diameter ports were provided to allow sand to be carried away by wave action rather than settle in the intake. A new bar screen was fabricated with 1.5-inch-diameter PVC pipe slipped over a one-inch threaded rod, and spaced six inches on center to prevent large debris from entering the intake structure. This provided a design that could flex to remove frazil ice buildup.

The new screen was fabricated offsite, barged to the intake location, and sunk into the excavated pit. During a break in weather, the intake structure and screen were placed over the riser pipe, and anchored in with three-inch-diameter galvanized anchor pipes jetted into the sandy lake bottom.

**Preliminary Design**

In 2014, the City selected B&N to prepare plans and specifications for a new intake. The City submitted to OWDA for a Planning and Design Loan. Funds were encumbered on June 26, 2014. A Planning Phase would evaluate use of the existing 36-inch intake as a standby intake and abandoning the original 24-inch intake structure. A new intake pipe would be sized to handle future water demands, improve water quality by constructing a new intake crib in deeper water, and minimize problems due to frazil ice blockage.

The final recommended improvement plan adopted by the City included construction of a new 36-inch-diameter PCCP 100 feet west of the existing 36-inch intake and a new intake crib 4,500 feet from the shore. Preliminary construction costs were estimated at $8.7 million. An application was submitted to seek Ohio EPA Water Supply Revolving Loan Account (WSLRA) funding.

The Preliminary Design Report concluded that it was necessary to provide a reliable source of water with at a capacity of 10 MGD to handle current demands with the best available water quality. The long-term solution would include construction of a new 36-inch-diameter intake crib and piping, rehabilitation of the existing 36-inch intake screen to become a back-up intake, and decommissioning the old 24-inch intake.
PLANNING PHASE

The City secured an OWDA loan to cover Planning and Design costs for the new raw water intake. A fast-track Planning Phase was outlined to meet deadlines to qualify for a WSLRA loan. The project had to be designed, bid, awarded and presented to the OWDA board in 2015 in order to qualify for the loan.

MUSSEL HABITAT SURVEY

A Mussel Habitat Survey was completed in the proposed project area by EnviroScience, Inc. in August 2014. The survey did not find any native freshwater mussel concentrations or suitable habitat for them. The U.S. Fish and Wildlife Service (USFWS) concurred the project is not expected to result in adverse impacts to native mussel species, including the Snuffbox mussel. Therefore, open cut trenching could be used.

ENVIRONMENTAL PERMITS AND COORDINATION

The proposed project will require authorization under Sections 404 and 401 of the Clean Water Act (CWA). The project is eligible for Section 404/401 authorization under Nationwide Permit (NWP) No. 12 (Utility Line Activities), except for the project length, which will exceed 1,500 linear feet in “waters of the U.S.” (i.e. Lake Erie). A Section 401 waiver application for this limitation was submitted in December 2014 to Ohio EPA simultaneously with submittal of the NWP Preconstruction Notification (PCN) to USACE for authorization under CWA Section 404.

Because Lake Erie is classified as a “Traditionally Navigable Water” (TNW), authorization under Section 10 of the Rivers and Harbors Act (RHA) also will be required. Section 10 authorization is anticipated to be included with the NWP No. 12 authorization for the project.

Early outreach and coordination with the following resource agencies has been accomplished pursuant to preparation of the PCN:

- A total of seven federally protected species are listed for Lake County, Ohio, including the Piping Plover, Bald Eagle, Kirtland’s Warbler, Indiana Bat, Northern Long-eared Bat, and Snuffbox Mussel (all Endangered species) and the Rufa Red Knot that is a proposed threatened species. The Ohio Department of Natural Resources (ODNR) Division of Wildlife reported no documented occurrences of state listed species or natural heritage features within the proposed project area.

- A Bald Eagle nest location is approximately 0.3 miles east of the proposed project area, but outside the recommended 660-foot radius restricted activity zone established by current federal guidelines.

- Because no trees are proposed to be cleared for the project, USFWS indicated it does not anticipate adverse project impacts to the Indiana Bat or Northern Long-eared Bat. USFWS indicated no additional coordination regarding these species is required, unless project parameters change such that tree clearing becomes necessary.

- USFWS expressed concerns regarding potential adverse project impacts to Piping Plover and Rufa Red Knot. A Designated Critical Habitat for Piping Plover exists at Headlands Dunes State Nature Preserve, located just east of the WTP...
property. USFWS indicated suitable habitat for these species exists within beach and dune zones of the project area. USFWS recommended that no disturbance to the beach and dune zones should be permitted within the project area during the migration stopover period for these species, specifically, between April 1 and October 31 each year.

As a result, open cut trenches were not a viable due to inclement wintery lake conditions between November and March. Therefore, directional drilling and microtunneling were considered to construct the first 2,000 feet of the project, while lake marine construction would be limited to the period from May to October. Launch and receiving pits for these activities will be located in previously developed areas of the WTP and offshore within the lake, respectively. Impacts to beach and dune zones that are located within the project area will be entirely avoided.

**ODNR IN-WATER WORK RESTRICTIONS**

ODNR Division of Wildlife restricts in-water activities in Lake Erie and other Ohio rivers and streams as a Regional Condition for Ohio Nationwide Permits. The purpose of the restrictions is to protect native fish species during sensitive spawning and migration periods. The applicable restricted period for Lake Erie is April 15 through June 30.

The City is requesting a partial waiver of ODNR’s in-water work date restrictions in order to capitalize on the calmer conditions that prevail in the lake during May and June. A longer work period, and more favorable work conditions, will greatly enhance the prospect of the project being completed within the proposed two-season timeframe. Approval is contingent on the review and scoring of the project by ODNR Fish Management staff at the beginning of each construction season.

**OHIO HISTORIC PRESERVATION OFFICE (OHPO)**

A completed Section 106 Project Summary Form was submitted to OHPO in October 2014 for review in accordance with Section 106 of the National Historic Preservation Act (NHPA). Documented historic properties were identified within one mile of the project area, including two properties listed on the National Register of Historic Places (NRHP). No adverse effects to these or other historic properties are expected as all finished elements of the project will be submerged or buried upon completion of the project.

**COASTAL ZONE MANAGEMENT PROGRAM CONSISTENCY**

The proposed project is located in the Ohio Coastal Zone. Therefore, it must be designed and implemented consistent with enforceable policies and permit requirements of the Ohio Coastal Management Program (OCMP), administered by ODNR.
continued from page 51 - lake erie intake

The City completed necessary underwater survey work and has applied for a Submerged Land Lease covering the permanent footprint of the new intake structure, as well as the two existing intake structures. A Shore Structure Permit will not be required, because there will not be permanent aboveground project elements in the shore zone.

WSLRA NOMINATION AND HARMFUL ALGAL BLOOM (HAB) AVOIDANCE FUNDING

In August 2014, the City of Painesville was notified that it qualified for zero interest funding for the project under the HAB avoidance program. In order to obtain the funding, all documentation had to be submitted, and the Ohio EPA review had to be completed, in order for the project to be bid and awarded in time to submit for loan approval by OWDA’s June 30, 2015 deadline.

The next challenge was to submit the Planning Report and Capacity Assurance documentation for review in accordance with the Ohio EPA/WSLRA requirements for the loan award. The deadline for bid advertising was April 2015 with award to the successful bidder by May 30, 2015 to meet the OWDA loan approval deadline.

DESIGN FAST-TRACKED TO MEET WSLRA DEADLINES

The City submitted for an OWDA Planning and Design Loan and funds were encumbered on June 26, 2014.

SITING NEW INTAKE CRIB DELIVERS IMPROVED RAW WATER QUALITY

The new 36-inch intake pipe will extend approximately 4,500 feet into the lake, located on a flat shelf in the lake bottom with the water intake inlets located in waters having an approximate depth of 24 feet.

At this location, the water quality is optimal for lower turbidity during storm events and can avoid algae bloom formations along coastal areas that contribute to increased levels of HAB in source water. In addition, the shore currents and wave action that increase the turbidity, suspended solids, debris, and possible algae blooms in the source water, will have much less of an impact on the intake in the new, proposed location.

Results of a lab jar test performed on a water samples collected five feet off the lake bottom at 1,000-foot intervals along the proposed alignment of the new intake, showed lower levels of turbidity and less chemical usage to treat raw water.

Placing the new intake crib further from shore in deeper waters significantly minimizes the impact on source water quality due to proximity from the end of the Fairport Harbor break wall where the Grand River empties into Lake Erie. Northeast winds tend to push the river plume westward toward the Painesville WTP. These plumes carry riverbed solids that result in higher turbidity levels and increased TDS and chloride concentrations. Their impact on water quality diminishes as the distance from the shoreline increases.

SURVEY TO ESTABLISH LAKE BOTTOM PROFILE

Sonar survey equipment was used to develop a topographic survey of the lake bottom in the vicinity of the proposed intake. A path extending 100-feet-wide on either side of the proposed alignment was surveyed and plotted. GPS coordinates for the existing 36-inch intake riser pipe and intake crib, the existing 24-inch intake crib structure, and the lighted buoy marking the intakes were obtained. Areas along the land portion of the project from the Raw Water Pump Station and extending to the shoreline were surveyed.

The existing Raw Water Pump Building was completed in 2003, and draws from existing 24-inch and 36-inch intakes from 1,200 feet out in the Lake Erie in 11 feet of water.
GEOTECHNICAL SURVEYS

Two land test holes and five lake soil borings were completed. Soil results showed that sand depths varied from 14 feet deep at the shoreline to six feet deep at the intake crib. Stiff clay was located three feet below the sandy lake bottom that was suitable for microtunneling and open cut trenches. The soils were able to maintain side walls for the open cut pipe trench with 1.5 vertical : 1 horizontal side slope for the trench. To excavate down to the top firm clay layer the sand had to be removed to maintain a 22 degree side slope and sidecast for reuse during backfill operations.

Clay will be excavated and sidecast adjacent to the trench. The trench will be excavated nine feet below the sand-clay interface, allowing 12 inches of stone bedding under the pipe, and backfilled to 24 inches over the pipe. Finally, a two-foot clay cap over the trench will prevent loss of the stone backfill. USACE provided preliminary approval that allowed a Nationwide Permit to be issued. This permitted both clay and sand to be excavated and replaced in the trench as long as the lake bottom elevations were properly restored.

DESIGN CONSIDERATION

The design of the new 36-inch-diameter intake and connection to the existing Raw Water Pumping Station requires special expertise in heavy construction techniques, cofferdams, tunneling, directional drilling, subaqueous pipe installation in open trenches, and intake cribs. Once the soil borings confirmed soil conditions, various methods to construct the new intake pipe were evaluated.

Discussions will be held with subaqueous pipe vendors about joining pipe sections, design of special fittings, and properly bedding the pipe in the trench. Installation methods were discussed with marine contractors regarding the feasibility, comparative costs, and risks associated with various installation options that were explored.

Since environmental restrictions have placed limitations on when and how construction work can proceed, the use of directional drilling or microtunneling for all or a portion of the pipe were investigated to evaluate their potential feasibility, costs, and environmental impacts.
WATER DEMAND AND INTAKE CAPACITY

Raw and finished water pumping records were analyzed to determine per capita water consumption, distribution system losses, and meter consumption of finished water. This data was correlated to a per capita water consumption of 95 gallons per capita per day for the existing service area. Input from the master water plan that is being completed forecasts the population to increase from 30,000 to 34,000 in 2015. Using water consumption data, the projected design flows in 2015 were forecast to be 4.2 MGD average and 8.9 MGD peak day flows.

To accommodate these projected demands, improvements to increase settling tank capacity from 7.5 to 9 MGD at the water treatment plant were included in future capital expenditure projections needed to obtain OWDA financing. Re-rating the existing filters also will be required to meet future demands. The proposed improvement costs will be paid for using an annual capital improvement fee that is included in utility bills.

Hydraulic studies for various intake diameters showed a 36-inch intake would provide a firm capacity of 10 MGD. A hybrid design was developed using a 36-inch-diameter Reinforced Concrete Cylinder Pipe (RCCP) for the microtunneling portion of the project, and Prestressed Concrete Cylinder Pipe (PCCP) for the lake portion of the project installed in an open cut trench sections.

Riser pipes will be installed to provide diver access to inspect and clean sand and debris. The 36-inch pipe diameter is sized to provide space for installation of chemical feed lines, and has an allowance for up to eight inches of sand accumulation on the bottom without reducing flows. A new intake crib with two compartments will be protected by two 14-foot square grated timber bar racks to minimize frazil ice blockage and prevent trash and large submerged logs from entering the intake pipe while maintaining velocities at less than 0.2 feet per second at peak water flows.

Water sampling locations at 1,000-foot intervals from the shore were gathered between July and October, and analytical testing to determine water quality and treatability studies were performed. The results showed minor improvement during calm days, but significant improvement during storm events.

Zebra Mussel Control: Buildup of zebra mussels on lake-bottom structures and intakes is a common problem that requires addition of KMnO4 to stem mussel formations. The chemical feed lines will be fed from a new chemical feed pump that is pumped through tubing installed in the intake pipe, and extends from the Raw Water Pump Station to suction pipes at the intake crib.

Frazil Ice Formation: Extremely cold water leads to the formation of frazil ice on intake structures. Its formation can plug the trash racks. Locating the intake in deeper water reduces the formation of frazil ice.

The design will include provisions to allow the 50,000 gallon elevated backwash storage tank to be released into the Junction Chamber #3 to backflush the intake pipe.

Junction Chamber #3 will be equipped with a pressure lid and sluice gate to isolate the new intake pipe for inspection and maintenance. A 12-inch motor-operated valve will open to supply water from the 50-foot-high backwash tank to “surge” the intake pipe and screen and free frazil ice deposits.

HYBRID DESIGN ADDRESSES ENVIRONMENTAL CONCERNS AND PROVIDES COST-EFFECTIVE SOLUTION

The design consists of three different materials and methods to construct the various segments of the intake pipe. The following are the key elements that must be addressed in the final design.

1) Connection to the Raw Water Pumping Station

Junction Chamber #1 (JC #1) was constructed over the existing 36-inch intake in 2001 when the new pump station was built. A new sluice gate will be installed to isolate the existing 36-inch PCCP intake pipe.
When the new intake is operational, the 24-inch crib will be demolished, and the 24-inch intake capped.

The new 36-inch pipe will be tied into the existing JC #1 and flow into the new Raw Water Pump Station through an existing 48-inch-diameter pipe. Sheet piling used to construct the existing wet well and JC #1 that was left in place after construction will be re-used to make a connection into the west wall of the existing JC #1 for the new 36-inch intake pipe.

2) Pipe installation on land between Junction Chambers JC #1, JC #2, and JC #3

JC #2 will be constructed 25 feet west of the JC #1, and will allow the new intake pipe to be directed at a 45 degree angle to the northwest toward JC #3. This section of pipe can be constructed in a sheeted trench or be installed using micro-tunneling techniques.

To construct JC #3, a new cofferdam will be built on the water treatment plant property behind the existing sand dunes located about 200 feet from the shoreline. Since construction work will be limited to November through March to preclude interfering with nesting habits of protected bird species, it was determined that an open-cut using a sheeted trench to install the pipe was not viable.

Since the barge cannot work in less than ten feet of water, it was determined that boring or drilling from JC #3 northward into the lake approximately 2,000 feet was necessary. This limited construction to use of directional drilling to install PVC pipe that would be pulled out into the lake from land; or micro-tunneling would be used to push the RCCP out to a temporary cofferdam situated 2,000 feet offshore.

3) Directional Drilling versus Tunneling for the Shoreline Crossing

Directional drilling can use either HDPE or PVC pipe. The wall thickness of HDPE pipe limits its pulling length due to the strength characteristics of the pipe.

PVC pipe is available in diameters that closely match the 36-inch-diameter of the PCCP intake pipe. The pipe could accommodate single pull of the entire 4,000 lineal feet of pipe, however, due to operating pressures, the bore depth would require a soil cover of 50 feet to prevent “blowout” of the bore hole due to the high pressures used for drilling operations. Thus, a siphon would be created between the crib and the JC #3. Directional drilling also precluded the installation of inspection risers to access the pipe.

Due to depth of the pipe and lack of intermediate access ports, it was determined that direction drilling was not cost-effective. Thus microtunneling was selected as the basis for the design of the shoreline portion of the pipe.

Microtunneling has been used successfully on a number of intake and outfall projects. Jacked pipe for microtunneling uses the same locking ring style pressure-rated restrained joint as the prestressed Concrete Cylinder Pipe (PCCP). The benefit of this technology is that the bore hole is supported by the pipe, and the drilling head of the boring machine is attached to the lead pipe and pushed forward from a jacking pit cofferdam located at JC #3. The pipe is not prestressed, but conforms to C-300 AWWA standards for wired wrapped steel reinforced concrete cylinder pipe (RCCP).
Microtunneling techniques will be used to drill into the lake through the clay layer beneath the sand bottom of the lake. A temporary cofferdam will be located approximately 2,000 feet into the lake. The temporary cofferdam is constructed using sheet piling driven through the sand and into the clay. Concrete-filled drilled shafts are used to create a circular cofferdam inside the sheet pile cofferdam. Sand and clay are excavated to the bottom of the pipe.

The temporary cofferdam is used as a receiving pit to remove the tunnel boring machine (TBM). PCCP is connected to the RCCP and open trench techniques are used from this point out to the crib. A riser tee section of pipe is installed at the end of the RCCP and extends to inside the temporary cofferdam for future pipe access. During microtunneling the TBM conveys excavated materials back to the jacking pit that are removed by crane for land disposal. Unit prices for the microtunneling and open excavation techniques will be competitively bid and the contractor will be able to designate options to extend the microtunneling further into the lake if feasible.

4. Subaqueous Open Trench PCCP Installation

Installation of the 36-inch-diameter PCCP intake using a barge mounted dredge for cutting an open trench in the lake bottom clay layer is difficult due to the sand layers above that must be removed. Sand varies in depth from 14 feet at the shore line to six feet at the crib. The soils report shows the sand must be layered back next to the trench at an angle of repose of approximately 22 degrees to open expose the clay layer. For 14 feet of sand, the disturbed area will be approximately four times the sand depth of the trench. Thus, the disturbed area varies for 60 feet on each side of the pipe centerline at the shoreline and reduces down to 25 feet at the intake crib. During the sand removal, the excavated sand is sidecast to minimize sand re-entering the excavation.

Plastic float curtains will be used to minimize dispersion of turbid waters from the excavation process and minimize spread of turbid water into areas adjacent to the intake construction work area and beaches. Curtains will be supported on the lake surface using floats, weighted by chains fastened along the bottom of the curtain to form a tight seal at the lake bottom.

The pipe trench width is dependent on the pipe outside diameter and allowing room for divers to work in the trench during installation. The pipe trench has an overall depth of nine feet from the top of the clay layer. There needs to be a minimum of 12 inches of bedding under the pipe barrel, and two feet of ODOT Class C limestone to cover the top of the pipe and act as ballast to prevent movement and flotation. A two-foot-thick layer of clay material will be placed on top of granular fill to create a cap to protect against washout and/or sand intrusion into the bedding layer. Excess clay will be placed over the pipe trench, and then sand replaced in the excavation to restore the lake bottom to its original contours.

The PCCP is manufactured and shipped to the jobsite in 40-foot lengths. Each pipe is pressure tested at the factory. A gasket and locking seat is provided to join two pipes together. Tabs are provided to use lag bolts to align pipe and draw pipe sections together. A proprietary process called “Hydro-Pull” is approved by AWWA and recommended by pipe manufacturers to reduce installation time and allow each joint to be tested before proceeding with the next section.

5. Intake Crib

B&N’s past experience with the design of other Lake Erie intake structures addresses many of the issues with a design that minimized entrance velocities at the bar rack openings in order to minimize frazil ice formation. A tee configuration is used at the crib to allow water to be drawn from two inlets.

All pipe materials, fittings, and connectors inside the crib will be fabricated from the same PCCP as the intake conduits. The inlet cone will be fabricated from stainless steel that is coated with an NDF approved epoxy coating to minimize zebra mussel buildup.
A potassium permanganate feed into the cone area will minimize buildup of the zebra mussels on the inlet cone and piping. The intake pipe will carry a secondary bundle of 1.5-inch-diameter tubing/conduits that are attached to the ceiling of the intake pipe to feed potassium permanganate (KMnO₄), compressed air, and future electrical power (for possible heat trace of the metallic intake bar screens).

The bar screen consists of 3x10-inch wood timbers that will be covered with heavy copper sheathing to reduce zebra mussel buildup, reduce cleaning costs, and improve the reliability of operations. Potassium permanganate (KMnO₄) will be fed to minimize zebra mussel formations in the intake pipe. Back-flushing the intake pipe through flow reversal will then be used to clear the blockage and restore flow.

The new crib will be seated on a heavy rock backfill supported by the clay layer under the crib to prevent undermining the crib structure. The foundation cushion will extend approximately 20 feet outside the limits of the wood crib. This will provide a firm foundation for the heavy anchor stone to be placed around the crib for protection against the forces of wave action on the crib structure. Inside the crib, large precast blocks or crushed stone will be used as ballast to prevent movement of the crib due to the powerful forces caused by high waves.

**TOTAL PROJECT COST**

The construction cost for the proposed project improvements are estimated to be approximately $10 million. It will require two construction seasons (2016 and 2017) to complete the lake portion of the project and an overall completion schedule of 30 months.

**ACKNOWLEDGEMENT:**

The author would like to thank City of Painesville and its staff for their involvement in the planning and design of the proposed improvement project.

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DDAGW Knows the ABCs of Operator Certification

The Association of Boards of Certification (ABC) recently named Ohio EPA’s Division of Drinking and Ground Waters’ (DDAGW) Operator Certification program the national 2015 Certification Program Award recipient for “raising the bar for the operator profession.” The program was honored for its efforts to streamline the process for approving exam providers and for rolling out e-application and e-payment systems.

“It is a great honor,” said Andrew Barienbrock (DDAGW). “It is a validation for me and my staff that our peers recognize our efforts to improve operator certification in Ohio.”

Andrew thanked DDAGW colleagues Deidra Davis, Jessica Dingman and Susan Parkins for their efforts in helping the program earn the award.

An international certification organization, ABC honored the program Jan. 14 at its 28th annual conference.

Critical Documents that Make or Break the MMO-MUG Test Result

Ohio EPA’s microbiological certification program requires extensive documentation to ensure reliable laboratory data. Analysts certified to test drinking water samples by MMO-MUG must have a thorough understanding of the microbiological records associated with the drinking water program and how the information fits together to support accurate results. Two documents discussed in this article, the Microbiological Test Data Sheet (bench sheet) and the Incubator Temperature Records, are directly linked to the analytical process of this method.

The information recorded on the bench sheets and in the incubator temperature records are tied to the analytical process and document key quality control components of the test. The data recorded in both logs directly impacts a sample’s validity. Together, these two documents show a snapshot of the entire analysis and demonstrate that the entire analytical process was in control, resulting in reliable data.

**Bench Sheet:** The bench sheet is used to record the most pertinent information about a batch of samples and helps document that the analysis was performed correctly. In order to prevent accidental misidentification of samples, each sample is assigned a unique ID number, along with enough information regarding sample location and the date and time the sample was collected.

Microbiological testing is time sensitive and must be initiated within 30 hours from the time of collection. Therefore, it is important to accurately record the date and time of collection and incubation so the bench sheet reflects that the samples were set up within the allowed hold time. Analysis of samples after the allowed hold time has expired can result in false negatives, which occur when stressed and/or dying bacteria in the sample are not able to grow.

Incubation start and end dates and times are also recorded on the bench sheet, in order to demonstrate that the samples were interpreted within the allowable time frame for the media being used. Colilert®, Colilert-18® and Colisure® are three common forms of MMO-MUG media used in the laboratory. Each media has been designed so that samples are interpreted within a specific time frame, which
represents the optimum time period for coliform and E.coli growth. If a sample is incubated past the allowable time period for a particular media, false positives may occur. False positives can occur when background bacteria overcome inhibitors designed to suppress growth of non-coliform bacteria.

For every batch of samples analyzed and recorded on the bench sheet, positive and negative controls (or quality control samples) are also analyzed and recorded. A batch of samples is defined as no more than 60 samples analyzed within a four-hour period. The purpose for these controls is to demonstrate that a known negative and a known positive can produce the expected results (i.e., the negative control does not change colors while the positive control changes colors and fluoresces under a UV light). If the controls fail to produce the expected results, the entire batch is considered invalid.

Incubator Temperature Records: Growth of bacteria is highly dependent on the temperature at which they are incubated. The incubator temperature record demonstrates that the incubator is being kept at an optimum temperature for coliform growth. When using MMO-MUG media, coliform bacteria grow best when incubated at 34.5°C to 35.5 °C. Therefore, in addition to quality control samples, routine monitoring of the incubator temperature is a critical aspect of analyzing for coliforms and helps ensure that the incubator has maintained the optimum temperature. Monitoring is done by placing a calibrated thermometer on each sample shelf and then recording temperatures twice per day (for example, once in the morning and then once again in the afternoon at least four hours later).

For questions about this article or the subject matter, please contact the Ohio EPA Division of Environmental Services (DES), Laboratory Certification Section at (614) 644-4245.

Compliance-Based Reduction of DBPs in Ohio

The State of Ohio completed the transition to Stage 2 Disinfection/Disinfectant Byproduct (DBP) Rule (Stage 2 Rule) from the Stage 1 DBP Rule in January 2013. Since that time, public water system (PWS) operators have worked diligently with Ohio EPA to take a multifaceted approach to reducing DBP formation. As a result, water quality in Ohio's distribution systems has drastically improved.

The operational evaluation level (OEL) is one piece of the Stage 2 Rule contributing to improved water quality in distribution systems. The purpose of the OEL is to serve as a warning to utilities that DBP levels are approaching an exceedance of the maximum contaminant level (MCL). Beginning with the transition from the Stage 1 DBP Rule to the Stage 2 Rule in 2012, Ohio has seen 85 PWSs exceed the OEL at least once for either TTHM or HAA5. Of those 85 systems, 62 have exceeded the MCL for either TTHM or HAA5.

Ohio PWSs are using a variety of methods to reduce DBP levels in order to comply with the Stage 2 Rule. Methods include optimization of operations through adjusting coagulant dosage, reducing pre-chlorination, and implementing flushing programs, including the use of automatic flush hydrants. Other Ohio utilities have intensified the fight to reduce DBPs by installing treatment, including granular activated carbon (GAC) filters for removal of DBP precursors, passive and active mixing, as well as aeration in clear wells and storage tanks to remove formed DBPs. Many other strategies for DBP reduction are available; there is no “one-size fits all” plan, but utility operators and managers should use the best method for their water system.
Responses to elevated DBP levels may vary, but will generally fall into one of the following three categories:

<table>
<thead>
<tr>
<th>1) Investigation</th>
<th>2) Operational Optimization</th>
<th>3) Treatment Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect special purpose samples at significant locations to identify problem areas.</td>
<td>Implement preventive tank maintenance programs, increase mixing and reduce turnover time in tanks.</td>
<td>Remove DBP precursors at the plant through enhanced coagulation/softening, activated carbon adsorption, anion exchange, and/or membrane filtration.</td>
</tr>
<tr>
<td><strong>Use on-site analyzers to reduce sample result turnover time.</strong></td>
<td><strong>Perform scheduled distribution flushing programs to reduce water age.</strong></td>
<td><strong>Remove DBPs after formation through tank mixing/aeration or biological filtration.</strong></td>
</tr>
<tr>
<td><strong>Identify the source of high DBPs.</strong></td>
<td><strong>Manage chlorine residuals at all points in distribution.</strong></td>
<td></td>
</tr>
</tbody>
</table>

What happens if my system exceeds the OEL and/or the MCL?

Many PWSs initiate an investigative process in order to mitigate high DBP levels before their system exceeds the OEL. Special purpose sampling for all systems with high DBPs will help to identify the areas of concern. If operational modifications are made it is a good idea to only make one change at a time in order to identify what type of impact the change has made.

When a PWS exceeds the OEL, they will first be contacted by Ohio EPA with a request to complete an OEL report addressing water treatment, distribution and storage in relation to DBP levels. Ohio EPA staff will be available to help identify the problem and make necessary modifications to reduce DBPs. If the OEL is exceeded in future quarters, the system will be required to re-submit the report with additional information related to any progress made since the last exceedance.

If a PWS exceeds both the OEL and MCL in the same quarter, it is required to complete the OEL report in addition to the public notice for the violation. Continued exceedance of the MCL will result in initiation of an enforcement action by Ohio EPA. It is highly recommended that PWS operators and managers take a proactive approach to operational control of DBP formation beginning at the moment high levels are reported. The OEL and other investigative tools, shown in the table above, should be used to identify the problem and ensure that necessary changes are made in an effort to provide the best product to the customers and to avoid violation of the Stage 2 Rule.

**Online Payment Options**

Most invoices issued by Ohio EPA may now be paid through our online eBusiness Center with a credit card or by debiting your bank account through the Automated Clearing House (ACH). The payment options for the DDAGW program currently include fees for operator certifications and licenses to operate public water systems.

To view this page, please visit [https://ebiz.epa.ohio.gov](https://ebiz.epa.ohio.gov). An online account is required. A service fee of 2.2% of the total amount owed will be charged for payments made by credit card.
There is no service fee for ACH payments, but they do require an Ohio EPA eBusiness Center Personal Identification Number (PIN). If you have a PIN for another eBusiness service, that same PIN may be used to pay by ACH. If you do not have a PIN, you may request one by completing the form available at the eBusiness Center.

For support, please contact Ohio EPA weekdays from 8:00 a.m. – 5:00 p.m. at (877) 372-2499.

**Introducing Ohio EPA’s eDocument Search**

In an effort to make public documents more easily available, Ohio EPA has created the eDocument (eDoc) Search, designed to improve efficiency; reduce costs; and greatly improve the public's ability to access Ohio EPA’s public records from anywhere without incurring copying costs.

The system currently includes the following document types, with a few exceptions.

Jan. 1, 2007 - Current

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilateral Compliance Agreement (BCA)</td>
<td>Director’s Final Finding and Orders (DFFO)</td>
</tr>
<tr>
<td>Judicial Order</td>
<td>Notice of Violation (NOV)</td>
</tr>
<tr>
<td>Rescission</td>
<td>Return to Compliance (RTC)</td>
</tr>
<tr>
<td>Warning Letter</td>
<td></td>
</tr>
</tbody>
</table>

As of Sept. 30, 2014, all outgoing documents going forward pertain to the following:

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjudication</td>
<td>Appeal</td>
</tr>
<tr>
<td>Assessment</td>
<td>Compliance Notification</td>
</tr>
<tr>
<td>Cost Recovery</td>
<td>Covenant</td>
</tr>
<tr>
<td>Director’s Authorization</td>
<td>General Correspondence</td>
</tr>
<tr>
<td>Inspection or Compliance Review</td>
<td>Lab Certification</td>
</tr>
<tr>
<td>Long-Term Planning for Regulated Entity</td>
<td>Monitoring or Sampling</td>
</tr>
<tr>
<td>Non-permit Related Exemptions</td>
<td>Non-permit Related Variance</td>
</tr>
<tr>
<td>Ohio EPA Monitoring</td>
<td>Permit – Intermediate</td>
</tr>
<tr>
<td>Permit – Long-Term</td>
<td>Permit – Short-Term</td>
</tr>
<tr>
<td>Plan</td>
<td>Referral to Attorney General</td>
</tr>
<tr>
<td>Registration</td>
<td>Remediation Report</td>
</tr>
<tr>
<td>Remediation Response</td>
<td>Report</td>
</tr>
<tr>
<td>Settlement Cost Recovery</td>
<td>Technical Assistance</td>
</tr>
<tr>
<td>UIC Monitoring Report</td>
<td>Verified Complaint</td>
</tr>
</tbody>
</table>

As of Dec. 15, 2014, most incoming documents pertaining to all of the document types above are being added as they are created. The only exception are those documents that come into the agency typically bound (large documents usually spiral bound or contained in binders.) The agency is planning to add these going forward in 2015.

*continued on page 66*
To get started with Ohio EPA's eDoc Search, visit epa.ohio.gov/dir/publicrecords.aspx#lt-112012639-edocument-search. This site provides frequently asked questions, search tips, a quick start video and a link to start a search.

Currently, there are more than 112,000 documents loaded into eDoc and available for use. Ohio EPA has an estimated 8 million documents to eventually upload into the system. It is the agency's intent to load documents based on the amount the document is requested, the usefulness of the document to the public and agency staff, and the document's retention schedule.

**Harmful Algal Blooms (HABs) Update**

On May 6th the U.S. Environmental Protection Agency (EPA) issued a two-tier health advisory value for two kinds of algal toxins found in some lakes and reservoirs. They recommend 0.3 micrograms per liter for microcystin and 0.7 micrograms per liter for cylindrospermopsin as levels not to be exceeded in drinking water for children younger than school age. For all other ages, the health advisory values are 1.6 micrograms per liter for microcystin and 3.0 micrograms per liter for cylindrospermopsin. The health advisory values are based on drinking water at these levels for up to ten days; in other words, consuming water at these levels over the course of ten consecutive days is not expected to result in negative health impacts. While based on a ten day exposure, U.S.EPA has indicated that states should treat the new health advisory values as a “not to exceed value with a cushion.” This means, based on specific conditions, public water systems may have an opportunity to adjust treatment prior to an advisory being issued. It does not mean public water systems will be allowed to exceed the threshold for nine days and issue an advisory on the tenth day. Ohio EPA is currently revising its Harmful Algal Bloom Response Strategy to be in considerations of these guidelines. The Strategy and other information about harmful algal blooms in Ohio are available at Ohio EPA’s website at http://epa.ohio.gov/ddagw/HAB.aspx. More information about U.S. EPA’s health advisory levels is available at http://yosemite.epa.gov/opa/admpress.nsf/0/547DC50C15C82AAF85257E3D004D7F67
Young Professional Committee of the Ohio Section
Judges Entries at the State Science Day

Hosted by The Ohio State University, Columbus, at the French Field House and St. John Arena, the 67th Annual State Science Fair was held on Saturday, May 16th. Drawing upon a base of over 35,000 students at more than 1,000 local school science fairs, more than 1,000 students in grades 5-12 from nearly 300 schools were evaluated at the 2015 fair.

Among those entries, 33 applied for judging of their projects by the Ohio Section AWWA. These entries qualified for consideration by being “outstanding projects focusing on drinking water, analytical techniques associated with drinking water, and analyzing drinking water, or other subjects of interest concerning drinking water.” A total of $575 was awarded to winning entries in three different divisions: Grades 5-6, Grades 7-9 and Grades 10-12.

Mike Giangiordano, of the AWWA Young Professional Committee, had great support in the judging of these entries. Judges were Tyler York, Winford Sterling, Michael Lloyd, Mickey Irwin, and Grace Halter. Twelve projects competed in the Grades 5-6 division, seventeen projects competed in the Grades 7-9 division, and five competed in the Grades 10-12 division. The projects this year included many relevant water topics and the judges enjoyed all the creative displays.

The Grades 5-6 award winners were: Ms. Sophia Meiser, Coshocton ES, Coshocton, 1st place ($50); Ms. Mohoni Parvate, Henry Karrer MS, Dublin, Honorable Mention ($25); and Ms. Anna Christine Ganim, Guardian Angels, Cincinnati, Honorable Mention ($25). Project title for the 1st place entry was “Can water be ‘washed’? What filtering method or cleansing agent best reduces the turbidity of water?”

The Grades 7-9 award winners were: Ms. Clare Mazzei, St. Vincent DePaul, Mt. Vernon, 1st place ($100); Mr. Ian Burt, Guardian Angels, Cincinnati, 2nd place ($75); and Ms. Makenna Korzan, Bishop Leibold E& W Campus, Dayton, Honorable Mention ($50). Project title for the 1st place entry was “Using Planaria as a Bioassay to Detect Water Toxins.”

The Grades 10-12 award winners were: Ms. Gloria Tie, Hudson HS, Hudson, 1st place ($150); Ms. Yoly A. Rodriguez, Horizon Science Academy, Cleveland, 2nd place ($75); Ms. Kayleigh Quiser, Hudson HS, Hudson, Honorable Mention ($50). Project title for the 1st place entry was “The Effect of High Temperature and Time on Plastic Bottles’ Water Quality.”

AWWA members interested in becoming involved with the Young Professional Committee should contact the judging chair at Mgiangio@CH2M.com or by calling Mike Giangiordano at 614-825-6723 (CH2M).
Bob Davis Appointed City of Cleveland Director of Public Utilities

On Monday, May 11, 2015, Mayor Frank G. Jackson swore in Robert L. Davis as the Director of the Department of Public Utilities. Mr. Davis has more than 28 years of experience as a utility professional including spending the past 14 years as the Director of Utility Services for the City of Warren, Ohio.

“Mr. Davis has a strong background in the field of Public Utilities and overseeing critical infrastructure improvements,” said Mayor Frank G. Jackson. “I am confident that his leadership and experience will create continuing success at the Department of Public Utilities.”

During his career, Mr. Davis has managed over $500 million dollars of capital improvement projects within water and sewer systems, oversaw upgrades to water pollution and distribution infrastructure, and has streamlined meter reading and collections processes.

Mr. Davis holds a Bachelor of Science from the University of West Virginia and a Class IV water license. He is the first African-American to be chairman of the Ohio Section of the American Water Works Association (AWWA) and the first and only African-American in the history of the City of Warren to hold the positions of Superintendent of Water and Director of Utility Services.

Dan Barr Joined ms consultants

Daniel Barr, PE, recently joined the ms consultants team as an Environmental Project Manager. Over the past 20 years, Mr. Barr has gained valuable experience with water systems including more than 65 projects involving treatment plants, water mains, pump stations, elevated tanks, water hammer analysis, and computer modeling. He also has experience in construction administration and inspection for water projects. Mr. Barr has always taken great pride that his work benefits communities on a daily basis.

Mr. Barr earned his Bachelor of Science in Civil Engineering from Case Western Reserve University. His interest for engineering was sparked after taking a college course in water and wastewater treatment, when he discovered that much of the engineering work was similar to community service.

Since joining ms consultants, Mr. Barr has contributed his expertise in water distribution and other kinds of pressurized systems. He is currently working on several projects, including the City of Columbus Parsons Avenue Water Treatment Plant Upgrade, the City of Columbus Henderson Road Booster Station Improvements, as well as the Muskingum Watershed Conservancy District Master Plan Implementation.

For the past ten years, Mr. Barr has served in various roles and committees of the American Water Works Association (AWWA), and he currently serves as the Chair of the Ohio Section AWWA. Mr. Barr has also presented and has been published as a thought leader on dozens of topics over the last few years, with the most recent covering water loss, distribution planning, air valves, and water storage sizing.

Congratulations to the 2015 Division Best Paper Awardees!

The following OAWWA Members were recognized by the Distribution & Plant Operations Division for the paper, “Importance of Pipe Deposits to Lead and Copper Rule Compliance” published in the July 2014 issue of the Journal AWWA.

Mr. Michael R. Schock

- Mr. Michael R. Schock, Senior Author, Chemist, USGPA, NRMRL, WSWRD;
- Ms. Abigail F. Cantor, Chemical Engineer, Process Research Solutions, LLC
- Dr. Simoni Triantafyllidou, ORISE Post-Doctoral Fellow @ EPA, Oak Ridge Institute for Science & Education
- Mr. Michael K. DeSantis, ORISE Post-Doctoral Fellow @ EPA, Oak Ridge Institute for Science & Education
- Mr. Kirk G. Scheckel, Research Soil Scientist, USGPA, NRMRL, WSWRD

Congratulations to:
Kevin Campanella Joins B&N as Utility Planning Leader

COLUMBUS, Ohio – Burgess & Niple welcomes Kevin Campanella, PE as Utility Planning Leader in the firm’s Columbus, Ohio office.

With 21 years of experience in wastewater engineering, master planning and utility management, Kevin has led complex, large-scale programs on both the public and private sides of the industry. At B&N, Kevin will expand the firm’s utility planning and integrated solutions capabilities.

A recognized expert in asset management, Kevin has been a keynote speaker and Blue Ribbon Panelist for national asset management workshops. His work has been published in select national and international publications. His expertise also extends overseas to New Zealand where he participated in an engineering exchange program as an asset management practitioner.

Kevin attended Cornell University where he earned a Master of Engineering and a Bachelor of Science in Civil and Environmental Engineering. He is a registered Professional Engineer and is an active member of the Water Environment Federation and the American Water Works Association.

Roger Baker Joins Civil & Environmental Consultants

Roger Baker, P.E., P.S. recently joined Civil & Environmental Consultants (CEC) as a senior project manager in the water resources group. Roger has over 40 years of engineering experience in investigative problem solving, selecting and leading design teams, developing municipal water and wastewater designs, and performing related work. Roger is active in numerous professional organizations including serving as a past chair of Ohio AWWA. Roger may be reached at rpbaker@cecinc.com.

Jones and Henry Names New Principals

Peter A. Latta is the Director of Construction Services, and is located in the Toledo office. Pete has been with Jones & Henry for 14 years and has a total of 17 years of experience, and supervises and coordinates the construction phases of virtually all of the company’s projects. He has a Bachelor of Science degree in construction engineering from the University of Toledo and is a member of the Construction Specifications Institute.

Jeffry M. Hersha is an Environmental Designer and USGBC LEED Certified Green Associate located in the Fort Wayne office. Jeff has nearly 30 years of experience in design and construction, 13 of those with Jones & Henry. Jeff develops conceptual design studies for incorporating sustainable infrastructure solutions, and provides project management oversight. He has a Bachelor of Science degree in environmental design from Ball State University, and is a member of the Indiana Water Environment Association, Water Environment Federation, American Water Works Association, North West Indiana Operator’s Association, Central Indiana Operator’s Association and past treasurer, vice-president and two-term president of the Northern Indiana Operator’s Association.

Advanced Degree/Continuing Education Scholarship Awards

The scholarship program was created in an effort to give back to the individuals who support the water industry and the American Water Works Association. It is designed to encourage water industry related education through scholarship.

The Scholarship Committee would like to congratulate the 2015 Scholarship Winners:

Tom Bell-Games, First Place $2500 award
Ohio University

James Hillegas, Second Place $1500 award
University of Akron

Christian Simmons, Third Place $1000 award
University of Akron

The OAWWA Scholarship Committee reviewed six applications for the 2015 award. The following judges reviewed the scholarship submissions: Dan Barr, Robin Liss and Steve Wyman. Their time and hard work is greatly appreciated.

Also, special thanks go to the Section Secretary Rick Griffing for coordinating the scholarship applications, letters and awards.
Columbus DPU Shares Design Concepts with OSU Students for Ozone / BAC Filtration Facilities at the City’s HCWP

The Columbus Department of Public Utilities (DPU) participated in the Capstone course at The Ohio State University (OSU) during the Spring semester. Ten (10) student design teams at OSU, acting as consulting firms, each prepared a Preliminary engineering design report. The report communicates to Ohio EPA preliminary design concepts for intermediate ozonation / biologically-active carbon (BAC) filtration facilities to be constructed at Columbus Division of Water’s (DOW’s) 125-MGD, Hap Cremeann Water Plant (HCWP).

Senior civil engineering students enhanced their project management skills by mentoring first-year engineering honor students in their respective design groups. All of the students experienced firsthand the information that must be gathered and the engineering principles that must be applied to generate a preliminary engineering design report – and, to reach agreement with Ohio EPA on the Approved Capacity basis-of-design table prior to commencing with Detail design.

OSU students were introduced to design concepts in a course that merges classroom learning with municipal water treatment. Instructor for the course, Prof. Linda Weavers, worked with City of Columbus and Ohio AWWA professionals from:

- Columbus DPU, DOW and Division of Sewers and Drains (DOSD),
- Ohio EPA,
- B&N, and
- MWH.

On a weekly basis an Ohio practitioner delivered a PowerPoint presentation at OSU to the student design teams:

- Presenting engineering concepts for that topic,
- Providing background data or guidance on where to find this data on the internet, and
- Suggesting what information should be developed and included in that section of their design team’s preliminary engineering design report.

The following practitioners delivered PowerPoint presentations on various pertinent topics to the students and provided information and data for the student groups to develop a related design submittal:

1. Rod Dunn of DOW
2. Gary Hopkins, HCWP Manager
3. Stacia Eckenwiler of DOW
4. Tim Huffman of DOW
5. Todd Pulisier of DOW
6. Dr. Stan Zachopoulos of MWH
7. Michael McWhirter of MWH
8. Bob Hrusovsky of MWH
9. Tom Bell-Games of B&N
10. Jason Sanson of DOSD
11. Nick Domenick of DOSD
12. Mark Eppich of DOW
13. Dr. Tim Wolfe of MWH

All 10 student design teams also toured the HCWP to witness firsthand the ozone / BAC filtration facilities currently under construction. The student teams revised their weekly submittals based on comments provided by Prof. Weavers and others and compiled them into a preliminary engineering design report. Each design team also prepared a 20-minute PowerPoint presentation to explain their ozone/BAC filtration design concepts to Ohio EPA. All 10 design teams delivered their PowerPoints to Prof. Linda Weavers and other OSU faculty members, Mark Eppich, Stacia Eckenwiler, Jason Sanson and Tim Wolfe. The team who most clearly communicated their message was selected to present their preliminary design concepts to Ohio EPA.

All 10 student design teams traveled to Columbus DPU’s 910 Dublin Road complex to support the selected design team.
Upon arrival at the DPU complex the students were greeted by a few dignitaries:

- Mark Eppich, Columbus DOW course coordinator, welcomed the students and the following special guests:
  - Professor Linda Weavers presented a synopsis of the Capstone course and thanked the practitioners from the City of Columbus, Ohio EPA and local consulting firms for providing this opportunity for OSU students to learn firsthand how water treatment projects are designed and implemented in Ohio.
  - Columbus DPU Director Greg Davies welcomed the OSU students and thanked DOW and DOSD staff for their leadership in continuing to make this joint endeavor between the City and OSU a reality.
  - Dr. Rick Westerfield, Administrator of DOW, noted this course is in its seventh year and DOW and DOSD staff members remain excited about its benefits. Administrator Westerfield pointed out that his staff continues to be committed to assist with both planning the course and providing instructors for this successful collaborative effort with OSU.
  - Ms. Beth Messer, Assistant Chief of Ohio EPA’s Drinking Water Program, encouraged the students to look into employment on the public side in Ohio when they complete their engineering degrees at OSU. Mr. John Arduini, Supervisor of Ohio EPA’s Engineering Unit and two of his colleagues Sanjeev Prakash and Sanjay Bansal listened as the top student design team presented its preliminary design concepts for the HCWP upgrade / expansion project. Members of the Agency’s engineering unit asked several pertinent questions of the student design team. They also pointed out additional information that would be helpful for the Agency to agree with their team concerning major design concepts for ozone/BAC filtration and increasing the HCWP’s approved capacity from 100 to 125 MGD.

The design team that took second place presented a poster board at the ‘engineering design showcase – senior capstone and first-year cornerstone projects’ that was held at OSU.

Prof. Linda Weavers of OSU was assisted in this capstone course on a weekly basis by Mr. Mark Eppich and Dr. Tim Wolfe - working with the student design teams to:

- clarify key information and design concepts,
- maintain the appropriate level of weekly effort expected of the students,
- answer questions/concerns raised by the students as each design team prepared a submittal (section) for its preliminary engineering design report, and
- provide comments and feedback on each design team’s weekly submittals.

Thanks to continued support from both the City of Columbus and the Department of Public Utilities led by Director Greg Davies, the two principal course objectives were once again met:

1. The OSU students were provided with a practical experience on how to develop a preliminary-design submittal for Ohio EPA and obtain the Agency’s comments on how to move forward effectively with preparation of detail design documents.
2. Collaboration among the City of Columbus, the OSU, Ohio EPA and local consultants once again introduced OSU students to Ohio's water treatment industry – showing the students the types of exciting environmental engineering opportunities available to them in Central Ohio.
Southern Manufacturer’s Exposition April 14th

The 28th Annual Southern Ohio AWWA Expo was held on April 14, 2015 at the Robert’s Center in Wilmington. Once again, Vactor trucks mingled with crystal chandeliers as more than 150 water industry operators, engineers and managers walked between more than 60 exhibitor booths. Six unique technical sessions were also held in the exhibit hall for contact hours ranging in topics from distribution system operation and maintenance to water treatment and emergency responsiveness. All of this knowledge (and popcorn) was provided free for pre-registered AWWA members.

Lance Livesay organized Top Ops simulations throughout the day. During the lunch hour, while the smell of chicken filled the banquet hall, everyone was encouraged to display their water prowess and compete for a chance to win prizes. Jerry Latham (Brown County Rural Water), Doug Mayo (Montgomery County) and Michael Smith (Central State) each earned $50 gift cards for their water knowledge and quick response times. Teams are still forming for next year! If you are interested in joining please contact Lance Livesay at (937) 754-3081.

After a one-year hiatus, the excitement of Meter Madness competitions also returned to the Southern Expo this year. District Meter Madness competition is complete for the Southeast and Southwest Districts. Three competitors from Columbus Utilities signed up; Zachary Couch, Greg Potts and Terry Senick. Zachary Couch was edged out by 9.04 seconds by Greg Potts with a time of 49.84 seconds. We plan to see Greg in Cleveland in September when he competes to represent the Ohio Section at A.C.E 2016 in Chicago. No one signed up for the Southwest District this year so they will not be represented at the Ohio Section Conference this September in Cleveland.

The Section Meter Madness Competition for September 2015 in Cleveland will consist of Sam Bodine of Lima Water, Thomas Burke of Cleveland Water, Greg Potts of Columbus Utilities and Paul Tucker of Lima. Best of luck for their upcoming challenge.

We would like to thank Mueller Systems for supplying all of the meters for this year’s District competitions.

In addition to the traditional door prizes from vendors, several study guide manuals from AWWA were raffled off for operators studying up for their next exam.
Northern Ohio Expo April 16th

The Northern Expo was held on April 16th at the new venue in the City of Dalton. There were a total of 103 vendors, and 435 lunches were served. 3 contact hours were offered by the exhibitors and there were over capacity on the educational tours. A few changes will be made for next year, but the venue went so well, that the facility is was booked for April 14, 2016. It rained for most of the event, which made it a little soggy for the outdoor exhibits. All indicated that they want to be indoors next year. The committee reported positive feedback and a larger expo is expected in future years.

We had 3 competitors from the Northwest District and Northeast District signed up to compete for Meter Madness. Kyle Burke, Thomas Burke and Geraldo Rivera from Cleveland Water represented the Northeast while Sam Bodine, Rob Coon and Paul Tucker of Lima Water represented the Northwest. Sam was not eligible for this competition because he is the defending champion from last year’s Section Competition which he will automatically be defending in Cleveland in September.

In the competition between the 2 entrants for the Northwest, Rob Coon came in second to Paul Tucker who had a time of 1 minute 7.09 seconds after an 8 second penalty for leak. In the Northeast competition, Thomas Burke beat out his brother Kyle by 3.46 seconds with a time of 41.07 seconds. Thomas had the best time of all district competitors this year on the Hersey meter.

The Section Meter Madness Competition for September 2015 in Cleveland will consist of Sam Bodine of Lima Water, Thomas Burke of Cleveland Water, Greg Potts of Columbus Utilities and Paul Tucker of Lima. Best of luck for their upcoming challenge.

We would like to thank Mueller Systems for supply all the meters for this year’s District competitions.
City of Columbus Holds Eighth Annual Central Ohio Children’s Water Festival

On May 19th, 2015 approximately 500, fifth-grade students attended the eighth annual Central Ohio Children’s Water Festival at Franklin Park in Columbus, Ohio. The Festival promotes environmental awareness of our valuable water resources through interactive displays, hands-on activities and fun workshops.

Students in attendance were from the following schools: Cassady Elementary, Columbus Jewish Day School, Harambee Christian School, Hubbard Mastery School, Oakland Park Elementary School, Ohio Avenue Elementary, Saint James the Less, Stewart Elementary, Trinity Catholic, Wickliffe Progressive Elementary and Windsor STEM.

The Festival began and ended with music from our DJ Tom Angelo – who helped keep the students entertained in the amphitheater while the busses were unloaded in the morning and loaded in the afternoon. The morning events began with half of the students attending five (5) of the thirteen, 15-minute presentations - predominately delivered by the Columbus Department of Public Utilities’ (DPU’s) water supply, water and wastewater treatment, and water distribution system and wastewater collection groups. The other half of the students interacted with presenters at three (3) of the thirteen 25-minute, hands-on workshops – learning about the irreplaceable resource of water and how it impacts our lives.

Before lunch the students were formally welcomed to the Central Ohio Children’s Water Festival by Columbus’ Mayor Michael B. Coleman, Columbus City Council members Zach Klein and Eileen Paley, and Division of Water (DOW) Administrator Dr. Rick Westerfield. Mayor Coleman announced Serafina Rees as the winner of the window cling contest and called Serafina and her teacher to the stage for recognition.

The winning window cling created by Serafina Rees of Wickliffe Progressive Elementary.
Before dispersing for lunch the Columbus pipe-tapping team demonstrated their talents for the students. Serafina, our window cling winner, assisted as the time keeper – Coach, Pat Crumley and Jill Taptich of DOW motivated the rest of the fifth-grade students to cheer on the team’s Setter - Chris Briggs, Cranker - Dan McClain and Copper - Ricco Ratliff as they raced against the clock to install a successful tap. Special thanks go to the pipe-tapping set up crew of Mike Spriggs, Dan Mathers and Nick Marsh.

After lunch, the fifth-grade students switched sides of the Franklin Park site so each group had the opportunity to participate in both the 15-minute and 25-minute presentations / hands-on workshops.

Several individuals served as key coordinators for this 2015 Central Ohio Children’s Water Festival:

- **Lorraine Winters**, Columbus DOW, and Tim Wolfe, MWH, who served as overall co-coordinators of the water festival – Lorraine also secured most of the 15-minute presentations / workshops from the Columbus DPU;

- **Michelle Eckels**, Resource International, who with assistance from Alicia Adams of Municipal Treatment, arranged for the 5th-grade students to attend;

- **Jeff Montavon**, Ohio EPA, who coordinated most of the 25 minute, hands-on workshops;

- **Jamie Decker**, CH2M, who organized and oversaw site preparation and layout at Franklin Park;

- **Cindy Jacobsen**, T&M Associates, who managed the more than 50 adult volunteers from among several professional organization, most of whom also provided funding contributions;

- **Kristen Atha**, Brown and Caldwell, who coordinated the window cling competition among the fifth-grade students;

- **Amy Tabor**, ARCADIS, who oversaw the financial sponsorship campaign, with assistance from Vui Chung, Burgess & Niple and Tim Wolfe, MWH. In total the group secured roughly $15,000 in donations from professional engineering firms and other organizations providing technical services in central Ohio.

- **Ruthanne Flottman** and **Anne Speakman**, Ohio EPA, who coordinated volunteers from the Agency – helping to keep alive this event that Ohio EPA initially established in 2008 and organized for the first two years; and

- **Elizabeth Veljanoski**, Franklin Soil and Water Conservation District, who oversaw and administered the Water Festival’s funding.

This year’s event would not have been possible without financial contributions from the following organizations: AECOM, ARCADIS, Brown & Caldwell, Burgess & Niple, CDM Smith, CH2M, City of Columbus DPU, CT Consultants, DLZ, Dynotech, EMH&T, Hazen & Sawyer, HDR, MS consultants, MWH, OWEA, Pelton Environmental, Ranney Collector Wells, Resource International, Ribway, Stantec, T&M Associates, Woolpert and 360 Water.

Thanks to everyone who contributed in some fashion to yet another successful Central Ohio Children’s Water Festival. A special thanks goes to Columbus DPU Director Greg Davies and DOW Administrator Rick Westerfield whose unwavering support has led to the long-term success of this effective educational event for Franklin County school children.
Welcome New Members – January-April 2015

Kelly Byrd, Canal Winchester
Gary Macmann, Findlay
Ashley Williston, Mentor
Samuel Bell, Blue Ash
Brian Lierl, Cincinnati
Brandon Leeth, Milford
Walter Schroder, Cincinnati
Patrick Eiden, Columbus
Kevin White, Westerville
Steve Beemer, Lima
Robert Barber, Chillicothe
Tyler York, Columbus
Bruce Rininger, Southington
Chris Gregory, Milford
Dave Canup, Columbus
Nicklaus Shoots, Stow
Chad Lamo, Westerville
John Corn, Cleveland
Juan Gonzalez, Cleveland
Christopher Petty, Sidney
Joe Peterson, Westerville
Bill Stout, Hamler
Michael Jones, Bolivar
Michael Vance, Columbus
Brandon Turner, Dayton
Rob Strobel, Dayton
Victoria Vara, Lorain
Chuck Lero, Defiance
Danny Pratt, Fairborn
Ryan Wagner, Windham
Brian Papa, Chardon
Chris Guinrich, Celina
Garr Uram, Mount Vernon
Kenneth Griffith, Napoleon
Shaghanegh Sorouri, Akron
Pooja Chari, Cincinnati
Karen Wells, Montpelier
Megan Dunkin, Mount Orab
Abriox, Inc., Mount Orab
Brad Zimmers, Aurora
John Hall, Aurora
Mark Rubino, Cleveland
Scott Stevenson, Kelleys Island
John Rice, Wooster
Mark Meyer, Wooster
Isabelle Hammer, Shaker Heights
Alex Axelton, Massillon
Curtis Hanstine, New Philadelphia
Mark Leichtamer, North Canton
Terry Gellner, Willoughby
Meredith Cariglio, Cleveland
Radames Rivera, Brooklyn
John Gentile, Steubenville
Ernest Lee, Cleveland
Gina Rothgery, Lorain
Jamie Hall, Ada
Chase Brass and Copper Company, LLC, Montpelier
Mohsen Behbahani, Toledo
Ryan Braun, Bluffton
Cody Smith, Fremont
Robert Binkley, Wauseon
Scott Stevenson, Kelleys Island
Chris Weaver, Columbus
Mohammed Khan, Columbus
Alison Allwes, Columbus
Anand Ekbote, New Albany
Daniel Garcia, Saint Clairsville
Mengyu Cai, Columbus
Rita Finy, Columbus
Tom Roberts, Columbus
Patrick Karnes, Grove City
Andrew Green, Westerville
W. Wright, Grove City
Dallas Williamson, Columbus
Jeffrey Smith, Bethel
David Knapp, New Albany
Mike Dodge, Coshocton
Mike Snyder, Coshocton
Justin Coffmon, Reynoldsburg
Tiarra Hayes, Wilberforce
Michael Smith, Xenia
Jerff Creamer, Jeffersonville
Village-Jeffersonville, Jeffersonville
Michael DeSantis, Cincinnati
Rebecca Phillips, Cincinnati
Rebecca Tortorello, Cincinnati
Jennifer Tully, Camden
Richard Fletcher, Hamilton
Yury Shtrarm, Cincinnati
Amit Sinha, Cincinnati
Hengye Jing, Cincinnati
Art Owens, Georgetown
Lyndei Eisenmann, Loveland
Don Borchers, Piqua
James Blevins, Dayton
John Hopwood, Dayton
Rachel Easter, Dayton
Erik Torgersen, Erlanger
Abba Ahmed, Las Cruces

Welcome new members!
Important Dates, Events & Newsletter Information

2015 National Conferences

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<th>Topic</th>
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<tr>
<td>Oct 26-29</td>
<td>Atlanta GA</td>
<td>Water Infrastructure</td>
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<td>New Orleans</td>
<td>Water Distribution II</td>
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2015 State Water Tests

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<tr>
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<th>Location</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Nov 5</td>
<td></td>
<td>Water I / II / III, Water Distribution I / II</td>
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2015 Specialty Conferences

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<thead>
<tr>
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<td>Water Distribution Workshop</td>
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<tr>
<td>Aug 18</td>
<td>Asset and Utility Management Workshop</td>
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<tr>
<td>Aug 27</td>
<td>Canton Hall of Fame Drinking Water Workshop</td>
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(6 Contact Hours Each)

2015 Review Sessions

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<th>Date</th>
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<td>TBA</td>
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<tr>
<td>Northwest</td>
<td>TBA</td>
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<tr>
<td>Southeast</td>
<td>TBA</td>
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<tr>
<td>Southwest</td>
<td>TBA</td>
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2015 AWWA Conference and Exposition

September 15-18, at the Cleveland Marriott and Cleveland Convention Center

District Conferences (Contact Hours TBA)

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<th>Location</th>
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<tr>
<td>Jul 16</td>
<td></td>
<td>City of Ottawa</td>
</tr>
<tr>
<td>Oct 22</td>
<td></td>
<td>Avon Lake (Joint NW/NE)</td>
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<table>
<thead>
<tr>
<th>Southwest District Meetings</th>
<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>Jul 26</td>
<td></td>
<td>Montgomery County</td>
</tr>
<tr>
<td>Oct 16</td>
<td></td>
<td>City of Zenia</td>
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</table>

<table>
<thead>
<tr>
<th>Northeast District Meetings</th>
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<tr>
<td>Aug 27</td>
<td></td>
<td>Hall of Fame Canton</td>
</tr>
<tr>
<td>Oct 22</td>
<td></td>
<td>Avon Lake (Joint NW/NE)</td>
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<th>Southeast District Meetings</th>
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<tr>
<td>Jul 16</td>
<td></td>
<td>Raymond Memorial</td>
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<tr>
<td>Nov 18</td>
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<td>Everal Barn @ Heritage Park</td>
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The Ohio Section Newsletter is the newsletter of the Ohio AWWA, published three times a year. Send comments, news notes, glossy / digital photos, and articles to:

Larry Valentine, P.E.
717 Shannon Avenue
Cuyahoga Falls, OH 44221
330-328-2137
lvalentine@neo.rr.com

Deadline for material to be in the 2015 newsletters are:

Winter Issue - October 2 - Target mailing week of December 7

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