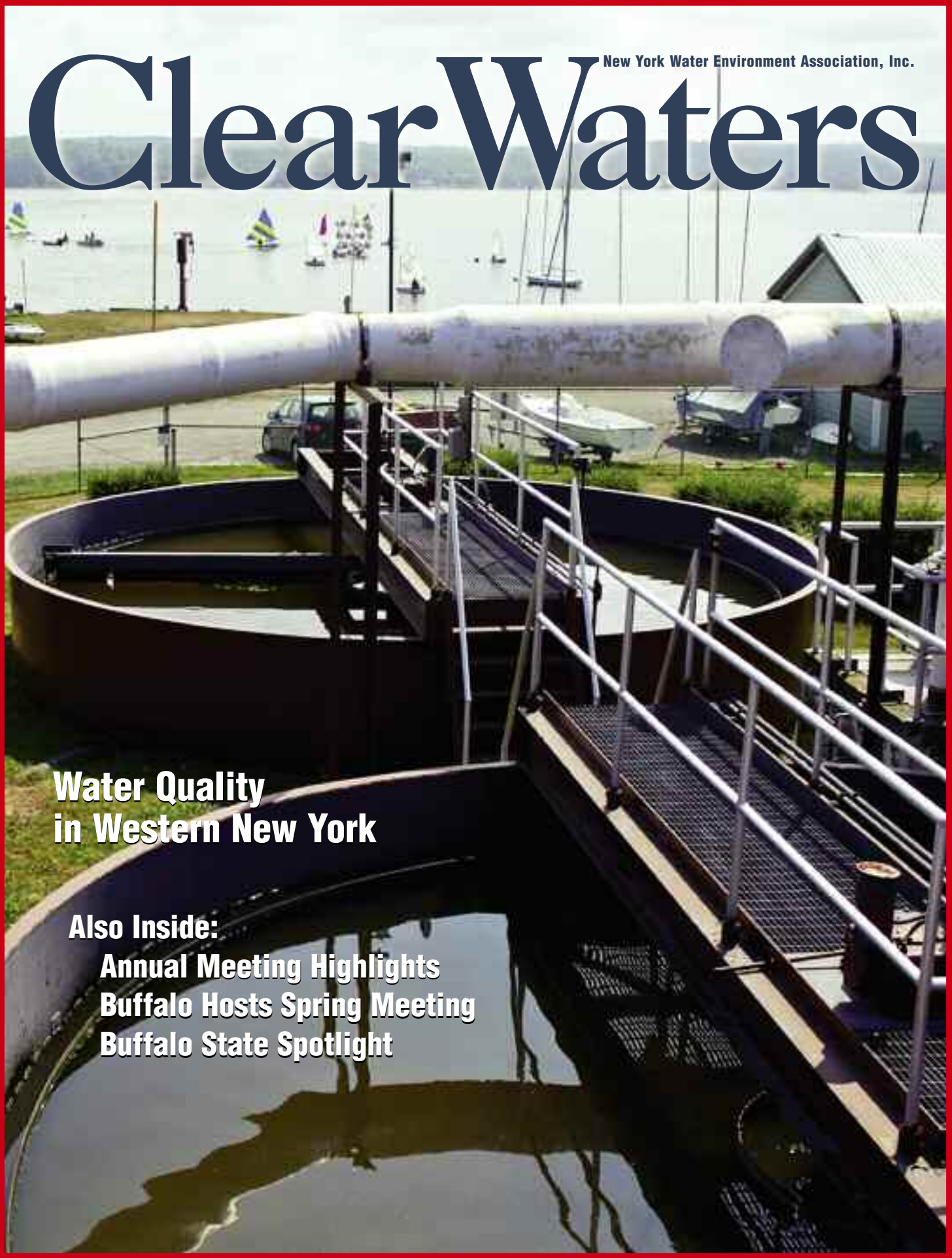
Spring 2012, Vol. 42, No. 1

New York Water Environment Association, Inc.

Clear Waters



Water Quality in Western New York

Also Inside:

- Annual Meeting Highlights
- Buffalo Hosts Spring Meeting
- Buffalo State Spotlight

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Clear Waters

New York Water Environment Association, Inc.

Cover Image: The oldest sewer system in the nation operated by Chautauqua Utility District's wastewater treatment plant is seen here looking from its secondary clarifiers onto beautiful Lake Chautauqua and a nearby sailing school during summer peak season.

Photo by Eve Edelheit

Clear Waters (USPS 004-595) (ISSN 01642030) is published quarterly with a directory every four years in the fall by the New York Water Environment Association, Inc., 525 Plum Street, Suite 102, Syracuse, NY 13204. Subscription is through membership; public subscription is $25.00/year. PERIODICALS postage paid at Syracuse, NY. POSTMASTER: Send address changes to the New York Water Environment Association, Inc., 525 Plum Street, Suite 102, Syracuse, NY 13204. Ph: 315-422-7811, Fax: 315-422-3851.

♻ **Clear Waters** *is printed on recycled paper, using soy-based ink.*

President's Message | Spring 2012

This issue of *Clear Waters* provides a focus on the history and upcoming initiatives that have and will improve water quality while protecting public health in the Buffalo area watershed. The City of Buffalo is the home of Buffalo Sewer Authority's Bird Island Wastewater Treatment Plant, which is the second largest in the state with an average daily flow of nearly 150 million gallons. This plant was originally constructed in 1938 with primary treatment. The Buffalo Sewer Authority and other municipalities in the region have undertaken numerous projects to mitigate the impacts of sanitary and combined sewer overflows (SSO and CSO). Some of these projects will incorporate innovative "green" technologies that will reduce stormwater runoff and will be integrated with traditional gray infrastructure. As is the case with most northeast old industrial cities, Buffalo is being challenged with the high costs of CSO programs with a historical declining population. I believe any new environmental initiatives must take into account the "knee of the curve" as costs relate to water quality benefit.

In this edition, an array of articles include elaboration on the history of water quality improvements with specific SSO and CSO projects. Also featured are articles from the Riverkeeper on the Buffalo River, and a history that includes the Erie Canal development.

Spring Conference

One of the annual highlights of our organization is its Spring Technical Conference and Exhibition. This year it will be held in Buffalo, in the heart of the theater and entertainment districts, while being close to the waterfront. One of the recent "buzz statements" is smart growth, which can be defined as a better way to build and sustain our cities. By having our spring meeting in an urban environment NYWEA is in concert with this statewide initiative. This also dovetails on the success of meetings held recently in Syracuse and Rochester.

The Spring Conference Committee, led by Dave Barnes with great support from the Western Chapter, is hard at work developing a strong technical program and social activities with networking opportunities (see pages 20–21). Also one of the features of the meeting will be the Operations Challenge competition. This competition always shows the depth and expertise of treatment plant maintenance and operations staff while being thoroughly enjoyable to watch.

Executive Committee

I would like to thank 2010 President Tom Whetham for his five years of service on the Board of Directors. Tom is a great friend who led this organization with distinction and was instrumental in the development of our five-year strategic plan.

We also welcome Mike Garland to the Executive Committee as vice-president–elect. Mike is the director of Environmental Services for Monroe County and brings tremendous technical and leadership skills to our organization. He was also the main driver that provided unbelievable support to the 2010 spring conference in Rochester.

I would like to congratulate Tony Della Valle on his successful year as president. He addressed numerous issues that have increased the value of the association to our membership. This included one of the most controversial, hydrofracking, thanks to the Government Affairs Committee, that was diligently, appropriately and professionally researched. Tony provided great leadership with unsurpassed attention to detail. He is also a true gentleman. Tony now becomes our past-president and he has already committed to staying involved with several committees.

84th Annual Meeting

The recent meeting was an outstanding success with solid attendance and over 165 exhibitors (see photo highlights, pages 6–9). The theme was aging infrastructure with a fantastic opening session that included a panel discussion on the complexities and challenges of aging infrastructure.

The engagement of dialogue between the panel and audience was excellent and once again this format was well received. Carter Strickland, commissioner, and Paul Rush, deputy commissioner of the New York City Department of Environmental Protection, also spoke. The opening session was concluded by the presentation of the prestigious Rockefeller Award to Congressman Timothy Bishop.

The last day of the conference included the awards banquet where over 40 awards were given to outstanding individuals and groups. At the banquet we also had the privilege of the presence of Water Environment Federation President–Elect Cordell Samuels who gave a passionate speech on the value of protecting our precious water environment.

Volunteerism and Initiatives

Our association's mission is to serve the best interest of the public by promoting sustainable clean water quality management through science, education and training. This mission is predominantly completed by volunteers. Volunteerism is defined as giving time, energies or talents to any individual or group for which the individual is not paid. I believe we must all endeavor to share our volunteer experiences that provide value to NYWEA, and protect our precious water environment. We will need the assistance from energetic young professionals and new members as we move toward this goal.

A quote from Winston Churchill is appropriate: *"We make a living by what we get, but we make a life by what we give."*

This year I hope to expand and build on past initiatives that have provided value to our membership with a focus on the Operator Training and Certification programs. Also, we will complete a Publically Operated Treatment Works Succession Planning White Paper, continue the Utility Executive's Group activities, and hold a specialty energy conference in Albany on November 15.

I consider it an honor and privilege to represent this association for the coming year, and look forward to seeing as many of you as possible.

Richard J. Lyons

Executive Director's Message | Spring 2012

In 2012, our nation celebrates the 40th anniversary of the Clean Water Act (CWA).

We have clearly made great progress on water quality issues, and have significantly reduced pollutants being discharged to our state's waterbodies through focused efforts in research, development and implementation of wastewater treatment. Municipal wastewater treatment facilities consistently meet the secondary treatment or higher effluent limits prescribed in their State Pollution Discharge Elimination System permits. Nonpoint sources of water pollution are being addressed through widespread application of innovative stormwater management practices. However, as the population grows and technology advances, we continue to face challenges associated with aging infrastructure, increasingly stringent regulations, energy management and emerging contaminants such as pharmaceuticals, personal care products and other organic compounds.

In 1965, New York State undertook a major comprehensive water pollution control program to protect its waters. The federal government and a number of other states followed New York State's lead. The NYS program was greatly strengthened by the support provided in the 1966 federal Water Pollution Control Act. In 1972, the federal government adopted the comprehensive, all-encompassing Clean Water Act, which included many of the provisions pioneered by the New York State Pure Waters Program. The NYS program was then subsumed by the CWA and became part of the national effort.

This is an important piece of NYS's history – that New York State led the way in pollution abatement and celebrates 47 years of progress even though it's the 40th anniversary of the Clean Water Act!

2012 Training Catalog

As noted in the Strategic Plan, "NYWEA exists to enrich the lives of its membership through professional education by providing quality training as well as networking opportunities to individuals with an interest in the profession." I think NYWEA's founders would be satisfied with this statement, and with the overall direction in which the organization is headed. For over 80 years, NYWEA has been educating and training its members.

We are very proud to announce the arrival of the 2012 Training Catalog. Thanks to the leadership of the Member Education Committee, Peter Radosta, the Part-Time Training Coordinator, Keneck Skibinski, as well as all seven Chapters, NYWEA, for the first time, presents a comprehensive online catalog of training available on its website homepage.

Identified as the #1 Initiative in our Strategic Plan – to provide training that complements the operator certification program and the professional development hours offered to engineers – NYWEA leaders recognize this as our organization's highest priority.

This online catalog is a new way to present training to the membership. It is compiled both by Chapter location and by date with a description of the training to be offered. As the Member Education Committee begins to develop the training for 2013, we welcome your input. If you see a topic missing or have a suggestion, please do not hesitate to contact me *(pcr@nywea.org)*.

Welcome New Board Members!

We welcome the following members to the 2012 NYWEA Board of Directors: Mike Garland, Adam Siewert, Richard Hults, Michael Manning, Kathleen O'Connor, William Nylic and William Grandner. We commend these individuals for their volunteerism and look forward to working with them to advance the mission of NYWEA.

Buffalo Water Quality Issues

Many thanks go out to Dave Barnes and Bryan Smith and the members of the Western Chapter for their hard work putting together the articles for this issue of the magazine. It is a nice prelude to NYWEA's Spring Technical Conference taking place in downtown Buffalo in June. I hope to see many of you there!

Patricia Cerro-Reehil

Upcoming NYWEA Meetings

Central Chapter Spring Meeting
April 4, 2012
Skaneateles, NY

Legislative Dialogue
May 8, 2012
Albany, NY

Spring Technical Conference and Exhibition
June 4–6, 2012
Buffalo, NY, Hyatt Downtown Buffalo

Watershed Science and Technical Conference
September 13–14, 2012
Thayer Hotel
West Point, NY

Chapter Training Meetings

Sustainability
April 11, 2012, Wallkill, NY

Confined Space Awareness
April 19, 2012, Rexford, NY

Pump Hydraulics, Selection, Sizing and Controls
April 25, 2012
Chenango, NY

Sustainability
April 25, 2012
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Asset Management for Wastewater
May 16, 2012
Bergen Point WWTP

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May 18, 2012
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Nutrient Removal Technology and Process Optimization
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Ilion, NY

Confined Space Awareness
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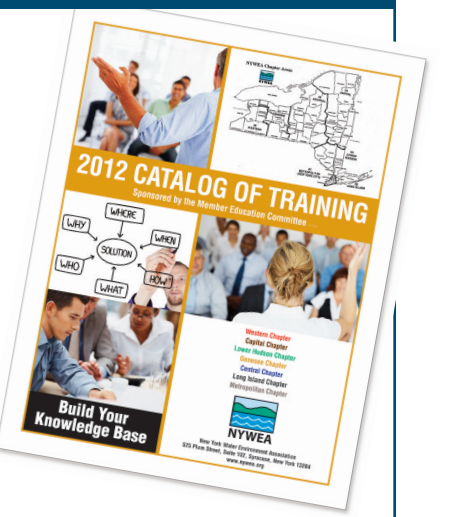
Fishkill, NY



Meeting Highlights

Marriott Marquis Hotel, New York City, NY

Highlights from February 6–8, 2012 84th Annual Meeting

NYCEP Commissioner Carter Strickland addresses NYWEA members during the Opening Session.

Paul Rush, Deputy Commissioner of the Bureau of Water Supply from NYCEP talks about the impacts and actions caused during Hurricane Irene and Tropical Storm Lee.

WEF President–Elect, Cordell Samuels, speaks to NYWEA members during the Awards Luncheon.

The official opening of the Exhibit Hall commences as Kathryn Garcia, Chief Operating Officer of NYCEP, cuts the ribbon. Looking on are (l–r) NYWEA Executive Director Patricia Cerro-Reehil, Exhibit Chair Joyette Tyler, NYWEA President Anthony DellaValle.

Jane Blair of the NYS Education Department addresses the students about the importance of becoming a Professional Engineer in New York State.

2012 Scholarship winner Sara Ann George is recognized by President DellaValle.

Members of the Opening Session Panel (l–r), Tom Lauro, Kathryn Garcia and William Bertera (not pictured: Tim Burns and Ilan Juran)

The first in-person meeting of the Wastewater Operator Certification Council. Back row (l–r): Anthony Gasparini, Walter Dobkowski, Mike Coley, Jim Keller, Bob Wither, President Tony DellaValle; front row: Tanya May Jennings and Patricia Cerro-Reehil, (not pictured: Florence Braunius and Van Bartlett).

Richard J. Lyons gives his incoming president's speech.

Dorothy and Nick Ilijic pose during the Super Bowl event sponsored by the Western Chapter.

Above: The Exhibit Hall is a busy place!

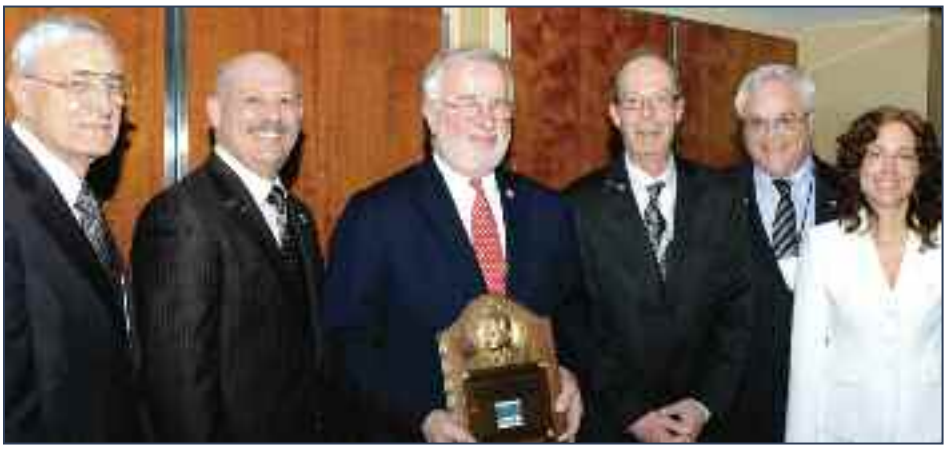
Right: Student Chapter Recognition Grants: President DellaValle presents the Second Place Award to Yuanqi Wang of Polytechnic University. (Not pictured: First Place Award to Clarkson University and Third Place to Manhattan College)

Charles Kayton receives NYWEA's Robert MacCrea Award presented by President DellaValle.

Ralph and Alice Kramden (left) make an appearance at the 84th Annual Meeting and strike a pose with Trixie and Ed Norton (Joyette Tyler and President DellaValle).

84th Annual Meeting Highlights *continued*

And the awards went to …



Congressman Timothy Bishop is presented NYWEA's Nelson A. Rockefeller Award. Pictured (l–r): Nicholas Bartilucci, NYWEA President Tony DellaValle, Congressman Bishop, incoming NYWEA President Richard Lyons, Steve Fangmann and NYWEA Executive Director Patricia Cerro-Reehil.

Camie McGraw receives NYWEA's Young Professionals Award.

Jean Malafronte is presented with the Committee Service Award by President DellaValle.

Above: President DellaValle presents David Barnes with the John Chester Brigham Award.

Above: President DellaValle presents Steve Bellone the Frank E. VanLare Award for his service while serving as the Babylon Town Supervisor.

Right: Mike Lannon accepts Onondaga County's Sustainability Award from President DellaValle.

Dr. Mark Greene is presented the Milton T. Hill Award by President DellaValle.

Left: Dr. Walter Saukin receives the Committee Service Award from President DellaValle for his many years as chair of the Student University Committee.

Mike Memoli is presented the Committee Service Award by President DellaValle.

Right: Sandy Lizlovs receives the Emmeline Moore Award from President DellaValle.

Above: Timothy Miller is presented NYWEA's John Chester Brigham Award by President DellaValle.

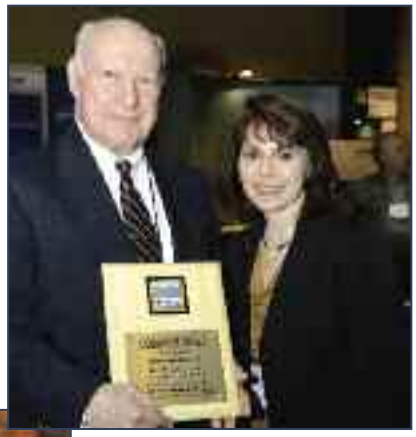
Above: President DellaValle, third from left, presents the Hall of Fame Awards to, (l–r), Bob Butterworth, William Grandner and Tom Lauro.

Right: Daniel Bentivogli is presented with the Committee Service Recognition Award by President DellaValle.

Richard Lenz is presented with the Environmental Engineer Award by President DellaValle.

Dr. Mark Maimone receives NYWEA's Kenneth Allen Memorial Award.

Above: Lisa Derrigan is presented with a Committee Service Recognition Award by President DellaValle.



Above: Joyette Tyler, Exhibit Chair, presents Syd Harris from Tasco Associates, Inc. with an Exhibitor Award for First Place Multiple Booths.

Left: Michael Manning is presented with NYWEA's Committee Service Recognition Award.

Left: Mary Jo Healy and Mike Garland, right, of Monroe County Department of Environmental Services accept the George W. Burke, Jr., Award.

Right: The Village of Sackets Harbor is presented NYWEA's Sustainability Award. Accepting the award is Kris Dimmick from Bernier Carr & Associates PC, shown here with President DellaValle.

Our thanks to Ken Skibinski and Jason@kjmphotos for meeting photos. To see additional photos, visit Facebook.com/NYWEA.

Early Infrastructure and Safety

In the early 1800s, the young United States was quickly expanding. Accessibility to the western territories was the key to settlement and prosperity. No efficient or inexpensive method yet existed to expedite the transfer of settlers west to the Northwest Territory (now the Midwest) or the movement of agricultural products to the eastern ports.

A handful of visionaries in New York State, eager to capitalize on these prospects, proposed a canal through the state to provide a quick, direct transportation route – one of the first mass public works projects in the nation. As many fourth graders learn in school, the Erie Canal stretched from Albany to Buffalo, connecting Albany to the Port of New York by way of the Hudson River and connecting Buffalo to the state's interior. It opened up Western New York to settlement and powered the growth of Rochester and Buffalo. Even now, nearly 80 percent of Upstate's population is within 25 miles of the Erie Canal.

Constructed over eight years and completed in 1825, it originally cut a swath through the middle of the state – 363 miles long, 40 feet wide at the surface, 28 feet wide at the bottom and four feet deep. The amount of earth moved during the construction makes my head hurt, even using a calculator. Construction methods for the canal would have been recognizable to the ancient Egyptians. Draft animals pulled loads and provided the original horsepower. Common laborers provided the physical labor for less than a dollar a day using the manual tools of the ages – axe, pick, spade, wheelbarrow, winch, chain, rope, block and tackle, fulcrum and lever. The route went through flat lands, swamps, forests and up escarpments.

The contrast to working conditions today is stark: no trench boxes; no personal protective equipment; drinking on the job; no minimum age; no retirement; no worker's compensation; untrained workforce; no air testing in shafts; and continual exposure to the elements. Sickness was rampant and cures were few, with broken limbs ending active working lives.

Workplace records in place today did not exist during the canal's construction. I have found conflicting accounts of the number of workers and fatalities. One even stated that 1,000 workers died in the attempt to cross the Montezuma Marsh due to swamp fever. Needless to say, injury and fatality rates now are a mere fraction of those back then.

Just like any other big public works project, the Erie Canal was nearly obsolete when it was completed. Within a short time, an improvement project was started to modify the cut of the original canal to allow larger boats. However, the Erie Canal had already delivered on its promise to provide better transportation for goods and people into and out of the expanding frontier of the nation.

–Eileen M. Reynolds, Certified Safety Professional
Owner, Coracle Safety Management

How Would You Like to Be NYWEA President in 2016?

If you are interested in a long-term, career-enriching opportunity, please consider applying for this important position.

Being an officer is a rewarding experience, but it is also a commitment of five years (Vice President–Elect, Vice President, President–Elect, President, Immediate Past President). When reviewing applicants, the Nominating Committee will take the following items into consideration (no one is expected to have all of these items in their resumé):

- Leadership skills
- Vision and managerial skills
- Active and viable state committee chair
- Active and viable state committee involvement
- Continuous membership tenure greater than 7 years
- Chapter endorsement (in writing)
- Active member of Chapter Executive Board
- NYWEA award recipient
- Chapter representative
- Chapter officer
- Regular attendance at state meetings
- WEF Board of Directors service

Please submit an electronic resumé with a cover letter that highlights any of the attribute areas above to:

Patricia Cerro-Reehil, Executive Director
NYWEA, 525 Plum Street, Suite 102, Syracuse, NY 13204 • **Phone** 315-422-7811 • **Fax** 315-422-3851 • **Email** pcr@nywea.org

Nomination deadline is August 1, 2012. All members are eligible to apply!

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Water – Life's Blood of Western New York Past, Present and Future

by Daniel Bentivogli and Molly Miller-Nagy

Since the Buffalo/Niagara Region was first discovered by settlers, whether Native or European, water has framed the region's history and development. Fresh water resources such as Lake Erie, the Niagara River, Lake Ontario and the numerous tributaries that make up the area's watershed provided a landscape that was suitable for settlement. From the original temporary stops that provided areas of rest and replenishment grew a permanent settlement, and then a village that would one day become the City of Buffalo and the surrounding metropolitan area.

Although the abundance of fresh water provided Western New York with one of life's most vital resources, it has also presented the region with some of its greatest challenges. Whether providing safe clean drinking water or the foundation for a thriving tourist destination, water continues to shape the region's future.

Photo courtesy of CRA, Inc.

A recent view from Lake Erie of the City of Buffalo waterfront

Buffalo sits at the mouth of the Niagara River on the edge of the eastern shore of Lake Erie, one of the five Great Lakes. The Great Lakes combined constitute nearly 25 percent of the world's fresh water, and the Great Lakes watershed drains 94,250 square miles (or 244,106 km2) through eight states and two countries. Furthermore, approximately 17 miles northwest, the river plunges over Niagara Falls, one of the world's most famous and visited waterfalls. From the falls, it continues approximately 16 miles where it flows into Lake Ontario.

Native American and European Settlements

Prior to the arrival of European settlers, residents of the Native Nations inhabited the western end of what was to become New York for more than 1,000 years. The Onondowagah (Seneca) Nation is a member of the six-nation Haudenosanee Confederation (Iroquois Confederacy). The Seneca Nation was known as the "gatekeeper of the western door." All of its settlements were located near water. Water allowed the development of agriculture, provided trading routes, kept the forests full of game and rivers full of fish. The Iroquois Confederacy thrived in Western New York and its influence spread far beyond the region – the Confederacy's constitution was, in part, the basis of the US Constitution.

European traders and hunters began arriving in small but steady numbers by the middle of the 18th century. In 1758, the first French settlement was established at the mouth of Buffalo Creek – the Buffalo River today. The British captured Fort Niagara in 1759 and burned the Buffalo Creek settlement. In that same year, a British military engineer designed a new Buffalo Creek settlement, which was the precursor to the City of Buffalo.

In 1789, Buffalo Creek had its first permanent settlers: Cornelius Winney and Joe Hodges. They established a log cabin store and trading post. In 1802, the Holland Land Company, based in Batavia, purchased from the British the land destined to become the Buffalo-Niagara region. Two years later, the Holland Company's Joseph Ellicott designed the Town of Buffalo Creek using the radial grid and street system still in use today. Ellicott also designed a road linking the east and west ends of the new town. This road enhanced trade and, equally important, provided access to an important source of fresh water – Cold Springs.

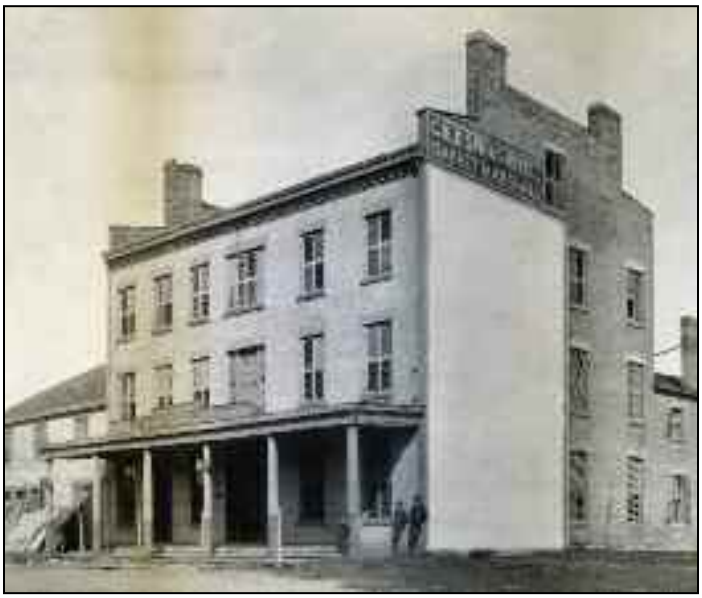

Photo courtesy of Buffalo & Erie County Historical Society

The Cold Springs Hotel and tavern, circa 1890, housed a spring water source in its basement which was used to make beer for patrons.

Photo courtesy of CRA, Inc.

A branch of the Jubilee Spring forms Crystal Lake within the Forest Lawn Cemetery.

The Cold Springs area was a meeting place for settlers, traders and Native residents. The springs are located on what is now the east and near west sides of Buffalo and were a cornerstone of regional development. The Cold Springs Tavern (commandeered by the military during the war of 1812) was constructed to house the Jubilee Spring in its basement. The beer produced from the spring water quickly became famous, a brewing tradition that lasted for more than one hundred years with dozens of breweries operating. The Cold Springs still exist, but they are buried beneath asphalt and concrete of roads and sidewalks. Jubilee Spring feeds Crystal Lake in the Forest Lawn Cemetery, and Hoyt Lake in Delaware Park is also fed by the springs. Buffalo's near east side is still known as Cold Springs and references to the springs appear in business names throughout the area.

Commerce Rises with Erie Canal

In 1808, the Town of Buffalo was formed, officially changing its name from Buffalo Creek. It became the county seat of Niagara County. The next step in the city's development again was determined by water – the Erie Canal. When it opened in 1825, it was considered an engineering marvel and, at a cost of $7 million, one of the biggest in the fledgling nation. The brainchild of Governor Dewitt Clinton, it was famously derided and scorned as "Clinton's Ditch." At the time the canal opened, there were 2,400 Buffalo residents.

With the opening of Erie Canal, the governor unleashed economic forces that helped shape and characterize the new nation. At the beginning of the 19th Century, the Allegheny Mountains were the western boundary of the United States. The Erie Canal changed that as it allowed travelers, settlers and businesses to move goods and supplies much more quickly. The Northwest Territories – what today are Illinois, Indiana, Michigan and Ohio – became accessible. In 1829, 3,640 bushels of wheat were transported from Albany to Buffalo. By 1837, the amount rose to 500,000 bushels and by 1841, more than one million bushels traveled through. Much of the commerce flowed through Buffalo's Commercial Slip at the terminus of the Erie Canal. Due to extensive growth, the City of Buffalo was incorporated in 1832. The canal was enlarged twice due to the increase in traffic, and a series of slips and canals were eventually added and the Buffalo River dredged. The Hamburg Canal went into service in 1852, but was plagued by problems. It was never completed – only a third of its original distance was ever built, and in 1898 the city filled in that canal.

The Erie Canal terminus was also a major crossing point and the last stop on the Underground Railroad, the major thoroughfare for escaped slaves. Today, tours of Buffalo churches and homes used by the famous "railroad" recount their route.

Emerging Technology and Water

As the city grew, emerging industry demanded advanced technology and innovation. The world's first steam powered grain elevator was built along the Buffalo River. By 1850, more than a dozen were built.

continued on page 15

Photo courtesy of WNY Heritage Press

Buffalo's Commercial Slip is seen here circa 1870, where most of the canal's commerce passed through; and below how the reconstructed Commercial Slip appears today – an historic waterfront restoration.

Photo courtesy of CRA, Inc.

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continued on page 16

continued from page 13

These 70 to 140-foot behemoths meant that water traffic and growth exploded. The elevators were invented in Buffalo in 1842 by Joseph Dart and Robert Dunbar. They solved the problem of how to stop grains from rotting. Fresh grain was elevated from the hold of a ship by use of a "marine leg" to the top of the elevator. Older grain was then loaded from the bottom for distribution, ensuring it went first. This development of commerce increased demand for water and infrastructure.

As astonishing and welcome as the growth was, growth also generates challenges. Increased population density brought problems such as access to fresh water and waste disposal. City officials recognized as a vital issue of its new modern age the responsibility of government to provide safe, clean drinking water and a means to dispose of waste. Filling a bucket at a stream is not an efficient or effective way to service a growing city. Certainly disposing of untreated human waste in the same water body is not a sustainable solution. Buffalo suffered cholera outbreaks in 1832, 1834, 1849 and 1854.

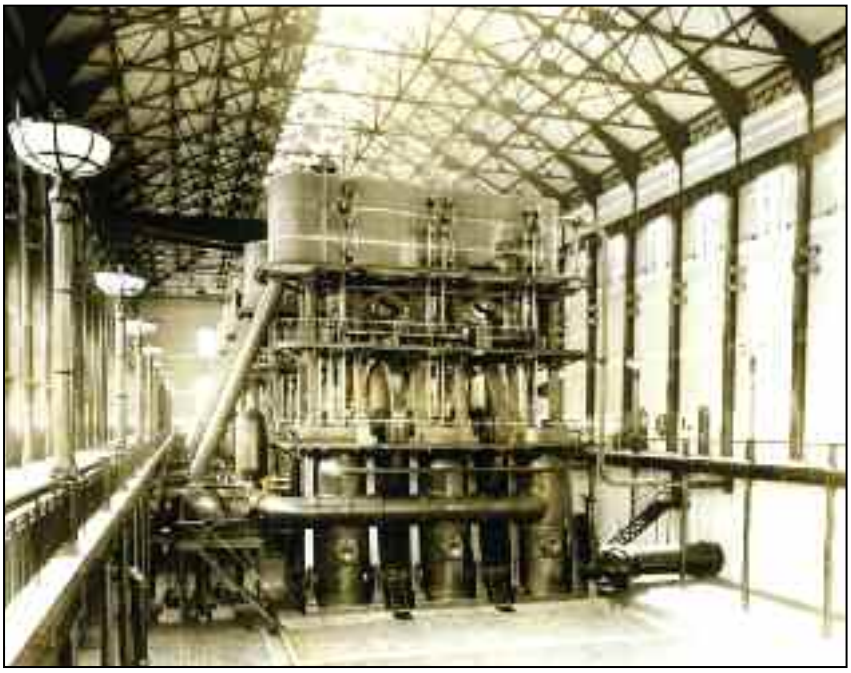

Photo courtesy of Buffalo & Erie County Historical Society

Installed in the engine room of the Col. F.G. Ward Pumping Station were five vertical, triple expansion steam pumping engines, each with 30 mgd capacity. When completed in 1915, it was the largest pumping plant in the United States.

Many city residents relied on fetching their own water or on entrepreneurs such as "Water John" Kuecherer, who established a business to supply residents with water from Lake Erie via a horse-drawn truck. However, as demand grew, the city adapted to its population's needs. In 1826, the Town of Buffalo invested in the Jubilee Water Works Company. The company was located at what are now Delaware and Auburn Avenues. The company installed wooden water pipes that same year. The water business was up and running. Jubilee Water was bottled, marketed and sold nationally. By 1830, the Cold Springs Water Company and the Sparkling Spring Water Company were producing and selling bottled water. In 1852, the Buffalo Water Works Company was formed and pumped its water from the Niagara River. The Bird Island Intake was constructed in 1876 and also drew water from the Niagara River.

Anticipating further growth, the city purchased both the Jubilee and Buffalo Water Companies in 1868. It also acquired land from the state and commissioned the Colonel Francis G. Ward Pumping Station on the Niagara River. The station was named for Buffalo's turn-of-the-century Public Works Commissioner, who had discovered a reliable source of drinking water – the Emerald Channel, near the mouth of the Niagara River. The channel is so named because the subaqueous limestone refracts sunlight through the clear water, producing an emerald green hue.

Photo courtesy of CRA, Inc.

Built in Art Deco style, the Colonel Francis G. Ward Pumping Station on the Niagara River

Photo courtesy of Buffalo & Erie County Historical Society

The Jubilee Spring House as it appeared circa 1904, where once water was bottled and sold by the city

Accessing the Emerald Channel proved another giant engineering challenge. A 6,600-foot tunnel had to be constructed from the plant to the channel on which the Roundhouse intake would be built. A second 4,400-foot tunnel had to be constructed northward to connect to the Massachusetts Street Pump Station. The construction of the tunnels and the Roundhouse intake in the Niagara River introduced the world to decompression sickness (DCS), or Caisson Disease. First seen during the construction of the Brooklyn Bridge, DCS became better understood as the relation between the pressurizations necessary in deep tunnel work and when re-entering normal pressure became evident.

The Ward Pumping Station, designed by the architectural firm Esenwein and Johnson, was the largest project on the Great Lakes. This visually stunning station was erected on the shore of the river

continued on page 16

continued from page 15

and is a classic example of Art Deco styling. In 1924, a filtration plant built adjacent to the pump station was commissioned. It was completed in 1927 and remains in use today. The Roundhouse is still in use and on the National Historic Register.

Photo courtesy of CRA, Inc.

The Roundhouse Intake, one of the city's most recognizable structures, is located 6,600 feet offshore in the Emerald Channel, a region in Lake Erie near the mouth of the Niagara River. Raw water is fed by gravity through a 12 ft.-by-12 ft. tunnel bored beneath the lake bottom and completed in 1913.

Sewer Systems Created

With increased water use for human consumption and commercial needs came an increased demand for sewers and eventually wastewater treatment. The prevailing philosophy at the time was "dilution is the solution to pollution." Indeed, at that time, looking at the vast waterbodies surrounding Buffalo, it was difficult to grasp that human produced waste could negatively impact them.

In 1848, Buffalo's Commission on Paving, Sewers and Lights issued a report calling for construction of a sewer system. Typically for the time, wastewater treatment was not considered. Seven combined sewers were built between 1847 and 1879, flowing to the Hamburg Canal and draining the rapidly growing Old First Ward and South Buffalo, both on the Buffalo River. The Swan Trunk was added in 1882, Hamburg Street Drain in 1884 and Alabama Street in 1897. In 1883, the Great Interceptor was constructed to route sewage downstream of the water intake to the Niagara River near Black Rock. All are in existence today.

By the late 1880s, the Hamburg Canal became an open sewer. The low flows in this canal resulted in significant solids deposition and foul odors. To address these concerns, the Hamburg Canal and its associated relief sewers were covered. A dry weather flow sewer was constructed on the south wall of the Hamburg Drain to convey this flow to the Buffalo River and, ultimately, the Niagara River. By 1900, the city's population would grow to 352,387.

Photo courtesy of CRA, Inc.

Interior of the filter plant gallery today. The Col. Ward Station Filtration Plant was completed in 1927 and is still in use today. At capacity, it can treat 160 mgd, and current usage is approximately 80 mgd.

Wastewater Treatment Demanded

In 1909, the International Joint Commission was created by the US and Canada. Its first report cited, "perilous pollution (of the Niagara and Detroit Rivers) endangering the health and welfare of the US and Canada" (IJC, 1910). By 1925, 80 percent of America's large cities (population of more than 100,000) had no sewage treatment and simply discharged waste to convenient waterways. Waste disposal remained this way until, in1935, the Buffalo Sewer Authority (BSA) was created.

An accidental discovery in 1913 would help pave the way toward a different path forward. Dr. G. Fowler, a British chemist, proposed a two tank fill-and-drain system to settle polluted water (essentially a primitive sequencing batch reactor). Two engineers – Edward Ardern and W.T. Lockett – experimenting with this idea stumbled on to the *activated sludge* process. The name stems from their initial misunderstanding of what they had discovered – thinking the sludge was similar to activated carbon. That was not true, but the name stuck. It pointed the way toward wastewater treatment by introducing oxygen and biological matter, or floc, to treat sewage.

Once established, the purpose of the BSA was to provide a sewer system that encompassed the whole of the fast growing metropolis and construct a wastewater treatment plant (WWTP). Bird Island, straddling the Niagara River and the Black Rock Canal, was chosen as the site for the new plant. Discharge was to the fast moving Niagara River. The BSA secured a $6.75 million grant from the federal Works Progress Administration and an additional $8.25 million low interest loan. Construction commenced.

The WWTP was a primary treatment facility consisting of six huge influent pumps (120 mgd each), grit removal, screening, settling tanks and chlorine disinfection. The chlorine facility was the largest of its kind in the world and was visited by scientists from around the world (including 135 sanitary engineers from then Nazi Germany). The buildings were designed in Art Deco style by the firm of Greeley and Hansen. After slightly more than a year of operation, bacterial levels in the Niagara River fell approximately 97 percent (BSA, 1940). By this time, there were 78 outfalls discharging to the Niagara River.

Photo courtesy of Buffalo Sewer Authority

The main operations building of the Buffalo Sewer Authority

The Federal Water Pollution Control Act (WPCA) was enacted in 1942. The Act's laudable goal was to make the nation's waters "fishable and swimmable." The WPCA was amended in 1956 and offered 30 percent grants for WWTP construction. By this time, the Buffalo River was polluted enough to burn (although the Cuyahoga River is better known for burning). In the 1960s, Lake Erie was declared "dead" as a result of low oxygen levels and high nitrogen levels, and having been overfished, this led to the collapse of the commercial fishing industry.

continued on page 19

continued from page 17

A seemingly unrelated event in 1957 was destined to have a major impact on the Buffalo-Niagara waters. The opening of the Saint Lawrence Seaway had a major impact on Great Lakes shipping. Ocean vessels no longer had to stop in Buffalo because of the construction of the Welland Canal connecting Lake Erie to Lake Ontario. This event slowly but inexorably led to the shuttering of Buffalo's waterside industries. Even so, negative environmental impacts continued to hamper the region's waterways for decades to come.

The Clean Water Act (CWA) was authorized in 1972 and mandated secondary treatment. The race for secondary treatment plants was on. In Western New York, the cities of Buffalo, Niagara Falls, Amherst, Lackawanna, North Tonawanda and the Towns of Orchard Park, Blasdell, Cheektowaga, Tonawanda, Lewiston and Newstead, all built their own WWTPs. Niagara County and Erie County both later added another WWTP. All of these facilities were built without the advantage of regional forethought. Possessing a service population of only slightly more than one million, the City of Buffalo's water and wastewater infrastructure, with some additional facilities, could have treated the flow adequately from surrounding suburbs.

Rebounding and What the Future Holds

As a result of clean water policies, the water quality in Western New York is significantly improved. Although lakes Erie and Ontario have rebounded, there are still problems. Lake Erie has a large eutrophic area in the western (shallow) end, and both lakes still have some fish consumption advisories, but fishing stocks have rebounded. The presence of lake trout, the return of nesting bald eagles and the re-establishment of the major migratory bird corridor – all are testimony to ecosystem health. The mouth of Smoke Creek is again a major walleye spawning area. The $50 million Buffalo River dredging project – the largest such project in the Great Lakes – will remove toxic sediments from downstream portions and the mouth of the river.

"Dilution is the solution" is no longer acceptable, and water quality challenges remain. The runoff pollution impacts of combined sewer overflows (CSOs) are now a major regulatory focus. The proposed solutions for the City of Buffalo alone require the level of expenditure approximating the initial CWA funding. Further, the water/wastewater plants are all at or close to the end of their design lives. According to a New York State Department of Environmental Conservation (NYSDEC) report from 2004, "Aging wastewater infrastructure is tied directly to the quality of New York State's waters." Yet, nationally, disinvestment by the federal government in water infrastructure is shocking, and funding continues to decrease.

The maintenance and replacement of water and wastewater infrastructure is a critical issue today. Western New York is fortunate to possess a vast array of water resources; however, with the use and development of these resources, citizens are obligated to conserve and protect them as well.

Daniel Bentivogli is CRA (Conestoga-Rovers & Associates) Senior Facilities Consultant in the Buffalo, NY office, and he may be reached at: dbentivogli@craworld.com. Molly Miller-Nagy, is CRA's Communications Representative.

Acknowledgements: Special thanks are extended to the Buffalo and Erie County Historical Society and the Industrial Heritage Committee for their assistance with information for this article.

NYWEA Spring Technical Conference and Exhibition
Hosted by Western Chapter June 3–6, 2012

by David Barnes

The Western Chapter of the New York Water Environment Association began its planning last year in anticipation of hosting the 2012 Spring Technical Conference and Exhibition to take place in Buffalo, NY on June 3–6, 2012.

Get ready for architectural masterpieces by Frank Lloyd Wright and others, world class modern art at the Albright-Knox Art Gallery, Broadway productions at the magnificent Shea's Performing Arts Center, a fascinating history and countless festivals and events, because Buffalo is alive with things to do and discover! On top of incredible entertainment, art and culture, Buffalo has a natural wonder – Niagara Falls, just 20 minutes away.

Within the Western Chapter's geographical area are several major watersheds. These major tributary watersheds to the Niagara River and Lake Erie include:

- **Tonawanda Creek (1,538 river miles)**
- **Cattaraugus Creek (1,435 miles)**
- **Buffalo River (1,006 miles)**

At its mouth, the Niagara River drains an area encompassing more than 265,000 square miles in the north-central United States as well as south-central Canada. The drainage area beyond New York includes four of the five Great Lakes, as well as some of the largest and most urban/industrial cities in North America.

There are many water quality concerns affecting these watersheds, including: wastewater treatment, pharmaceuticals in wastewater and surface water, nutrient removal requirements of watersheds, changes in discharge requirements, need for public education, hiring and training new WWTP operators and more energy-efficient operation of facilities, to name just a few.

This edition of *Clear Waters* includes several articles on Western New York and the progress achieved with water quality improvements here over the past several decades. The Spring Conference will expand on this water quality work and address other concerns for current water quality, as well as present some of the traditional NYWEA membership topics, such as safety, operator training, new technologies for treatment processes, green infrastructure, industrial issues and updates on regulatory requirements.

Photo by Visit Buffalo Niagara

The Anchor Bar, home of famous Buffalo wings

Important meeting highlights include:

Wet Weather Initiatives: Current projects being planned to manage rainfall in several large communities will be discussed in several technical sessions, including local wet weather management plans.

Local Project Displays: Special displays will be featured at the conference by Western New York wastewater utilities and communities. This will also be an opportunity for local universities to get involved and showcase the research they have been doing to assist with communities addressing and investigating water quality concerns.

Photo by K.C. Kratt

The Erie Canal Harbor 4th of July fireworks

Photo by Angel Art Ltd.

Going through the locks at Lockport, NY along the Erie Canal

Local Cuisine: The meeting's social functions will showcase the developing waterfront and include a sample of authentic Buffalo cuisine.

Other Events: The conference will also offer an Exhibit Hall, special events for visitors and the annual Operations Challenge competition which will have a new twist – teams will compete during a non-technical food event that will include the original Buffalo wings from the Anchor Bar – the place where they were invented.

This Spring Conference will be an outstanding opportunity to network with other operators, design professionals, regulatory agency personnel, researchers, equipment suppliers and service providers!

Check the NYWEA.org website for up-to-date program information and registration.

David Barnes, PE, is the NYWEA Spring Conference Management Chair. He is a project manager with CRA Infrastructure and Engineering in Buffalo, NY.

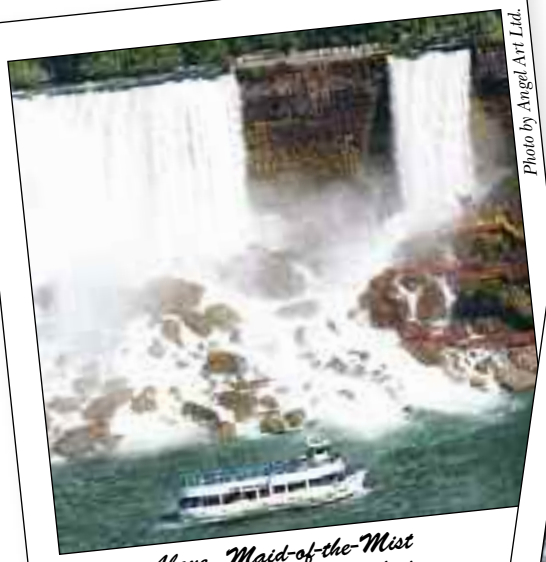

Photo by Angel Art Ltd.

Above, Maid-of-the-Mist passing under and visitors viewing atop of Niagara Falls (right)

Photo by Angel Art Ltd.

Photo by Angel Art Ltd.

Theodore Roosevelt historic site

Photo courtesy BSA

USS Little Rock anchored at Buffalo and Erie County Naval and Military Park on the Buffalo River

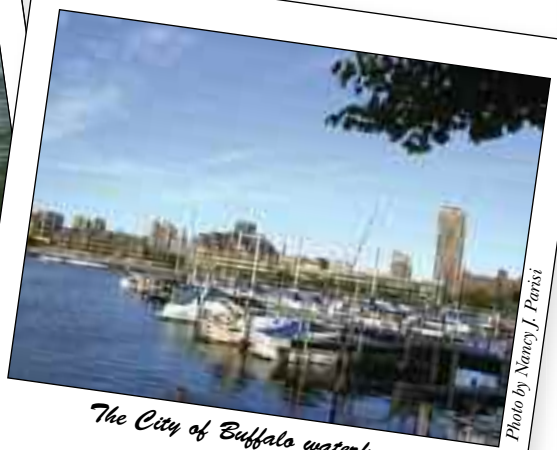

Photo by Nancy J. Parisi

The City of Buffalo waterfront

Photo by Visit Buffalo Niagara

Frank Lloyd Wright's Darwin-Martin House

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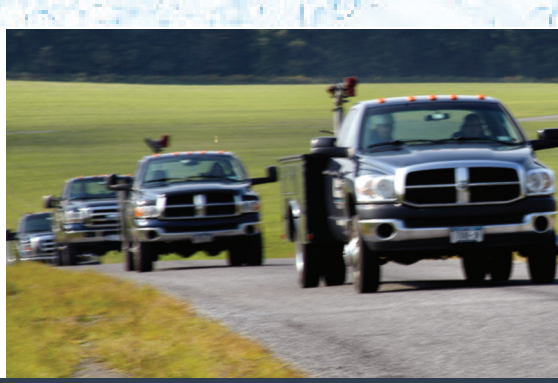

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Sewer Systems Promote a Greater Erie County

by Joseph Fiegl

One of the primary issues facing the suburban and rural areas of Erie County in the 1950s was inadequate sanitary sewer service. Progressive regional planning was seen as the manner to address public health concerns for the areas surrounding the City of Buffalo.

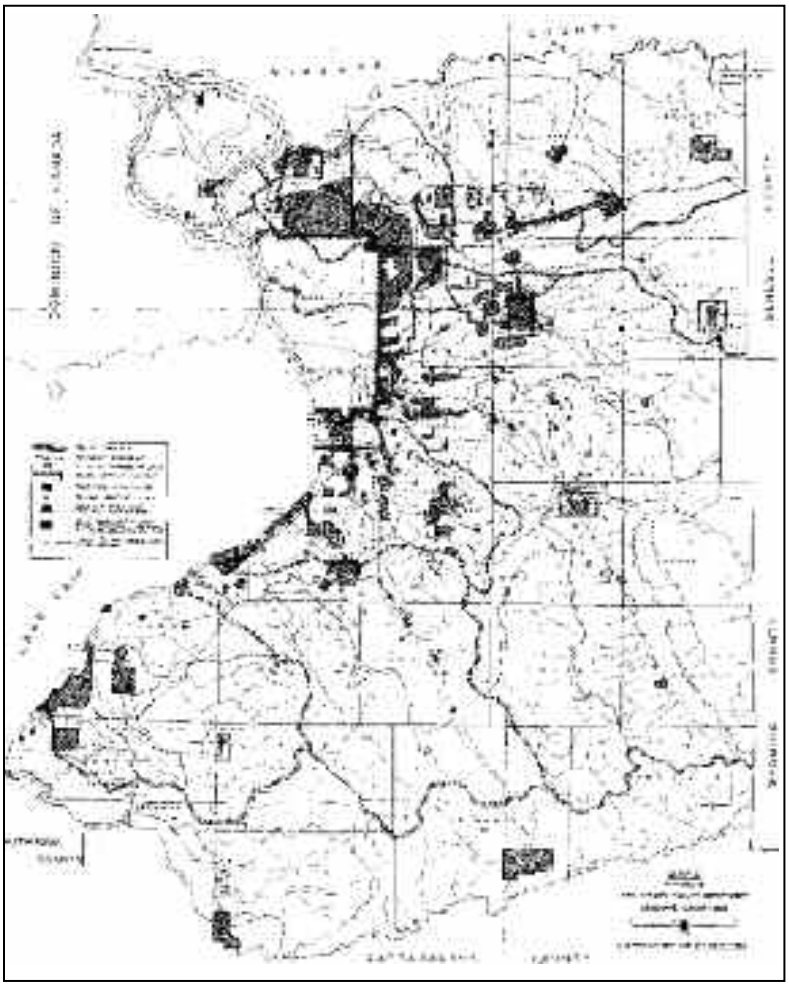
Courtesy of Erie County DSM

Small wastewater treatment facilities like this one serving the Erie County Home and Infirmary were found throughout Erie County circa 1960.

In the 1930s, the Buffalo Sewer Authority had undergone a coordinated effort to provide sewage treatment services to the entire City of Buffalo at a single facility: the Bird Island Wastewater Treatment Plant. After construction, primary treatment and disinfection of the city's sewage had eliminated many of the public health concerns – such as typhoid fever and intestinal diseases – that were prevalent in the Buffalo area and locations downstream on the Niagara River. Due to the high population density within the city boundaries, a single facility solution suited Buffalo well. However, the surrounding communities were less densely populated, with development generally occurring on the fringes of the city and at village centers scattered throughout the county.

As areas outside of the city increased in population, wastewater treatment facilities serving several properties were favored in lieu of private onsite systems as the means to dispose of sewage. The first wastewater treatment plant in Erie County was constructed in the Village of Lancaster around 1907. At that time, the village hired Dr. Karl Imhoff from Germany to design the facility's Imhoff tanks. In other village and town centers, municipalities began to construct sewerage infrastructure to serve their residents. When new developments came to fruition, a corresponding treatment facility was installed by the developer. The result was numerous small decentralized treatment plants being built and subsequently operated throughout Erie County.

By the mid-1950s, there were 42 public sewer systems with wastewater treatment plants in the metropolitan area of Erie County – most of which were combined systems. Several of these treatment plants were municipally operated; others were the responsibility of the equivalent of a neighborhood association. There were numerous facilities that were under performing and did not provide the proper protection of their discharge locations, which often were smaller streams with less assimilative capacity. Most towns were rural in nature and did not have the knowledge or financial resources to provide proper sanitary sewer services. Consequently, the Erie County Board of Health saw the need to regionally evaluate this issue to ensure that sewerage facilities were no longer "developed in an uncoordinated, uneconomical, and unsatisfactory manner."



Courtesy of Erie County DSM

Figure 1. Sewerage infrastructure outside the City of Buffalo seen from 1956 Erie County Sewer Survey map

The Erie County Board of Health commissioned a study to investigate and evaluate the future provision of sanitary sewer services in the county (***Figure 1***). The product of this effort was a report titled, "Progressive Sewer Systems for a Greater Erie County" (Nussbaumer and Clarke, 1956). The most significant recommendation from this endeavor was the proposal to create, "an administrative unit with the authority to plan, construct, and supervise sewerage facilities throughout the expanding portions of the county," with the use of County Sewer Districts as the approach. By no means was this recommendation met with universal support; the thought of a county organization playing a pivotal role in certain towns and villages was resisted by many that preferred their "home rule" status. Conversely, it was realized by many municipalities that large scale regional systems would be less expensive per connection, would likely provide more efficient services and would better protect water resources.

In 1959, a local law was developed modifying the county charter to change, among other items, the makeup of the

continued on page 25

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continued from page 23

Erie County Department of Public Works to include a Division of Drainage and Sanitation. This change was proposed by the Board of Supervisors and ultimately approved by the citizens of Erie County in the November 1959 general election. In 1960, specific duties of the new division and its Deputy Commissioner were defined. At the formation of the Erie County Sewer District (ECSD) No. 1 in 1961, there were a total of four county employees dedicated to planning and implementing sewer services in a coordinated manner.

Growth of ECSD Wastewater Services

Today there is a much more efficient service structure for the Erie County suburbs and rural area. A total of seven county sewer districts have been created to serve portions of 22 municipalities throughout Erie County. Municipal systems that are not within the bounds of an ECSD work cooperatively with their neighboring communities to realize the benefits of watershed based service, where feasible. The result is that the number of publicly owned treatment works has been decreased by half in less than 50 years, water quality has improved significantly with the upgrade of infrastructure, and the number of residents with access to sewer service has increased substantially.

It took much effort to get to this point. Former employees of what is now the Erie County Division of Sewerage Management (relocated out of the Department of Public Works and renamed in the 1970s) recently chronicled what they remembered about the first years of the DSM. At the beginning, there was no county owned infrastructure, no design standards, no sewer use ordinances, no equipment. There were several consultant studies (such as the Erie County Comprehensive Sewerage Study by Greely and Hansen (1968) that provided guidance and a general directive from the county administration to "get it done." Public referendums held as a requirement of sewer district formation, spurred many community and religious leaders to spread the word about the benefits of the proposed sewer district. Elderly residents came out to vote in favor of sewer district formation on behalf of the future health of their grandchildren and great-grandchildren. The value of protecting water quality and public health within the growing sections of the county was recognized by significant portions of the populace.

Courtesy of Erie County DSM

Screw pumps at the Southtowns Advanced Wastewater Treatment Facility during construction in 1979

Courtesy of Erie County DSM

Erie County Southtowns Advanced Wastewater Treatment Facility in present day

Each County Sewer District has evolved in its own distinct manner ***(Figure 2)***. The ECSD No. 4 has followed a very slow evolution, based on reports from over 40 years ago. The ECSD No. 6 was formed out of necessity to save a local municipality from bankruptcy in the 1980s. The ECSD No. 3 probably underwent the greatest changes over the years, originally one of many service providers in the area just south of the City of Buffalo, providing only collection and transmission services (see more details below). In 1974, the formation of a Southtowns Sewage Treatment (SST) Agency was completed to develop a regional plan for wastewater treatment in this corridor. This agency would be a stand-alone entity, with the county providing the staffing and oversight of the construction and ongoing operation/maintenance of the interceptor sewers and treatment plant. The need for the upgrades in the Southtowns corridor was reinforced a few months before the final formation of this agency when a major fish kill occurred in a local stream after a sanitary sewer overflow.

The Southtowns Advanced Wastewater Treatment Facility went online in December 1980 and started full operations in 1981. This facility ultimately replaced seven smaller and under

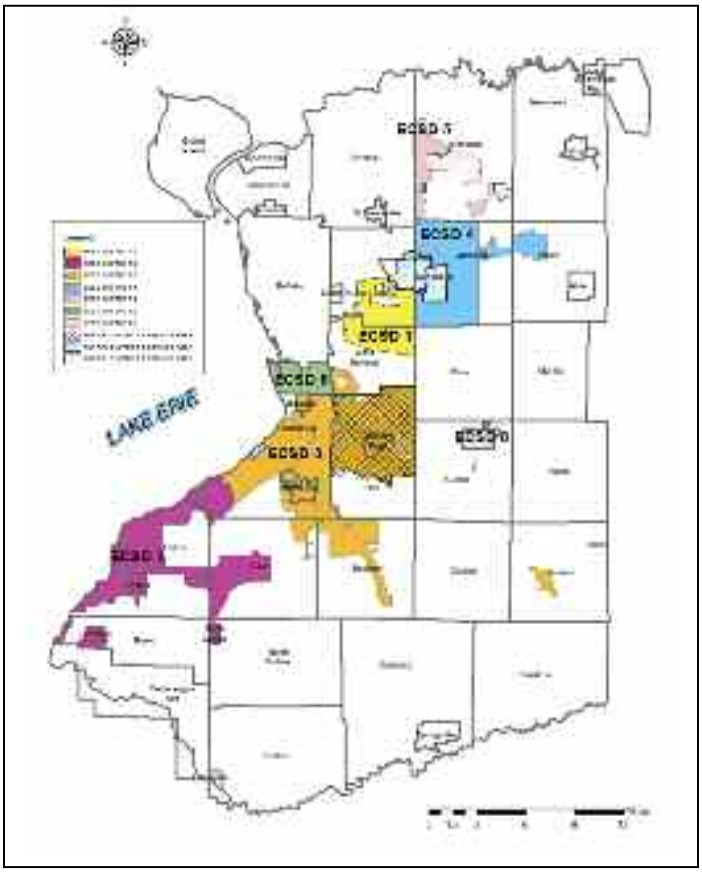
continued on page 27

continued from page 25

performing treatment plants, numerous community septic or sand filter systems and an undetermined number of private onsite treatment systems. It also ceased discharge of wastewater from ECSD No. 3 to overloaded sewers in other portions of the county. In 1983, ECSD No. 3 constructed the Holland Wastewater Treatment Plant to service the areas that could not be economically serviced by the Southtowns facility. In the last decade, several of the members of the SST Agency have transferred over the operation of their collection systems to ECSD No. 3. Additionally, the Village of Blasdell recently relinquished control of its collection system and treatment plant – a facility that originally was to be eliminated when planning for the Southtowns Advanced Wastewater Treatment Facility commenced. After 32 years of existence, the agency moved to dissolve and all infrastructure was merged into ECSD No. 3 in 2006. The result is that a sewer district that originally only had 92 miles of trunk sewers and a few pumping stations, now is responsible for three treatment plants, 31 pumping stations and 354 miles of sanitary sewers. All of this change essentially occurred in a 30-year timeframe.

There have been interesting and pioneering moments in the history of what is now ECSD No. 3:

- When Rich Stadium (now Ralph Wilson Stadium) was constructed as home of the Buffalo Bills, local Girl Scout and Boy Scout members were hired to flush all of the toilets and turn on all of the faucets at the facility simultaneously, to make sure the design calculations for the sewerage infrastructure held up under real world conditions (fortunately, they did!).
- There was a time in the late 1970s when the Buffalo Bills home opener was almost postponed because a pumping station had a major failure a few days before the game. Division of Sewerage Management staff worked around the clock to bring the facility back online before kickoff.



Courtesy of Erie County DSM

Figure 2. Current Erie County Sewer Districts map

FAST FACTS

Erie County Division of Sewerage Management 2012

- **Seven (7) County Sewer Districts**
- **Full-Time Staff:** 237
- **Number of customer accounts:** 94,400 (residential and nonresidential)
- **Population served:** approximately 250,000
- **Total Budget:** $51.3 million
- **Seven (7) wastewater treatment facilities**
  - o **Southtowns Advanced Wastewater Treatment Facility** – 16 million gallons per day (mgd) permitted capacity; pure oxygen process provided by a vacuum pressure swing absorption (VPSA) unit – discharge to Lake Erie.
  - o **Big Sister Creek Wastewater Treatment Plant** – 7.68 mgd permitted capacity; extended aeration process – discharge to Big Sister Creek.
  - o **Lackawanna Wastewater Treatment Plant** – 4.5 mgd permitted capacity; pure oxygen process provided by a PSA unit – discharge to Smokes Creek.
  - o **East Aurora Wastewater Treatment Plant** – 3.14 mgd permitted capacity; Schreiber process – discharge to Cazenovia Creek.
  - o **Blasdell Wastewater Treatment Plant** – 0.83 mgd permitted capacity; trickling filter process – discharge to Lake Erie.
  - o **Holland Wastewater Treatment Plant** – 0.18 mgd permitted capacity; rotating biological contactors process – discharge to Cazenovia Creek.
  - o **Clarence Research Park Wastewater Treatment Plant** – 0.02 mgd permitted capacity; activated sludge package plant – discharge to groundwater.
  - o Wastewater for ECSD Nos. 1, 4, and 5 (and a small portion of ECSD No. 3) treated at Buffalo Sewer Authority and Town of Amherst facilities.
- **Five (5) overflow retention facilities**
- **98 pumping stations**
- **463 grinder pumping units**
- **1,036 miles of sanitary sewer**
- **48 miles of storm sewer (ECSD No. 6 only)**

continued on page 28

continued from page 27

- A New York State Park with a beach was constructed directly next to the Southtowns Advanced Wastewater Treatment Facility – something that would not have occurred before the facility's construction and Clean Water Act implementation.
- The Division of Sewerage Management had installed a 180-foot tall windmill at the Southtowns Advanced Wastewater Treatment Facility in the 1980s, ahead of the recent proliferation of wind power in the US.

Wastewater Services in ECSDs – Present and Future

As noted, the provision of sanitary sewer services by ECSDs recently reached its golden anniversary. The Erie County Division of Sewerage Management (DSM) is now responsible for an extensive network of infrastructure ***(see Fast Facts sidebar)***. The Division has grown from four employees to a staff of over 230. The DSM works with the Buffalo Sewer Authority, town, city, and village municipalities throughout Erie County to protect local water resources.

There are several projects in the works to continue to make wastewater services in Erie County more efficient. In the last decade, mergers of sanitary sewer services have been completed that have resulted in 13 separate municipal entities relinquishing all wastewater responsibilities to the Erie County DSM. These mergers have streamlined the service structure and allowed for economy of scale savings. In addition, a more watershed or "sewershed" based approach, which is not focused solely on municipal boundaries, is being applied in numerous instances. For example, there are projects in final design in ECSD No. 3 to eliminate the Blasdell Wastewater Treatment Plant and numerous pumping stations – facilities that would not have been necessary if regional planning was implemented in the first place. The Erie County DSM has also eliminated sanitary sewer overflows in one particular community that was under an Order on Consent (prior to a merger) by employing solutions that may not have been viable if the area was not part of the larger ECSD.

For the next 50 years, the mission of the DSM will be the same as many other service providers: to protect the environment, address aging infrastructure and regulatory requirements, become more efficient, and act in the best interests of ratepayers.

Before a coordinated effort to address wastewater infrastructure began in the 1950s, one of the major barriers to the advancement of Erie County was seen to be inadequate handling of sewage. The DSM and other local service providers continue to endeavor to allow for a "Greater Erie County" through employment of cost effective and environmentally sound practices.

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Acknowledgements: Special thanks to former employees, Charles Alessi, PE, and Val Mozdziak, for information on the history of the Erie County Division of Sewerage Management.

References

Nussbaumer and Clarke, "Progressive Sewer Systems for a Greater Erie County," Erie County Board of Supervisors – Survey Committee and Erie County Board of Health, Buffalo, New York, 1956.

Greely and Hansen, Erie County Comprehensive Sewerage Study, New York, 1968.

Community Solution for Combined Sewer Overflow

by David P. Comerford and David Barnes

Communities across New York State are looking for solutions to improve public spaces while they face shrinking budgets. Wastewater utilities are implementing significant infrastructure projects to better manage combined sewer overflows (CSO) and meet their long term control plans (LTCP) and regulatory commitments.

The Buffalo Sewer Authority (BSA) has been investigating a novel approach to create a publicly accessible nature preserve while addressing combined sewer overflow (CSO) management. Can a green solution, integrated into the city's landscape, provide improved public space while managing a CSO problem? The proposal of CSO management with treatment through a constructed wetland is an approach as old and natural as Mother Nature herself. This innovative solution may be just the opportunity the community has been seeking.

BSA's Combined Sewer System

The BSA owns and operates a combined sewer collection and treatment system. Through its State Pollution Discharge Elimination System permit, the BSA operates 52 CSO discharges. These permitted CSOs discharge combined sanitary sewer and storm waters to the local receiving bodies during wet weather events.

In 2004, the BSA completed a draft LTCP to address the US Environmental Protection Agency's (USEPA) CSO Control Policy. The LTCP presented a comprehensive list of improvements to reduce CSO discharges and, subsequently, improve the quality of receiving waters. The BSA was requested to expand the LTCP and is currently finalizing a revised LTCP that will present additional improvements across the entire BSA service area for mitigating the volume and number of CSO discharges.

One component of this revised plan is the Smith Street Drain CSO - the fourth largest CSO in BSA's collection system based on annual discharge volume. The outfall for the Smith Street Drain CSO is located within Smith Street Park and discharges to the Buffalo River. Recent LTCP efforts have focused on upstream improvements to the Smith Street Drain watershed. The goal of these improvements is to reduce the volume and frequency of overflows by maximizing storage of wastewater in the existing collection system. The proposed watershed improvements will significantly reduce the number of CSOs; however, in order to reduce the frequency to six overflows or less per typical year, additional improvements are necessary to attain the reduction goals.

Smith Street CSO Objectives

Two sets of objectives were developed for the management of the Smith Street Drain CSO. The primary objective is to reduce the number of CSO events to six or less per year. The secondary objectives are to minimize long term operations and maintenance (O&M) costs of CSO treatment and provide a model green project for CSO management around the region and country. These objectives led the BSA to evaluate two system alternatives to reduce the discharge of untreated flow through the Smith Street Outfall: in-line and off-line storage and return to the BSA treatment facility; and, onsite treatment via a constructed wetland prior to discharge to the adjacent Buffalo River.

To comply with the USEPA guideline of no more than four to

continued on page 32

Photos by David Barnes

The treatment wetland will be integrated into the existing wetland and park land (shown in these photos), located adjacent to the Smith Street Drain outfall.

continued from page 30

six overflows per year at a particular overflow, the BSA will use a combination of in-line and off-line storage. The in-line portion will be accomplished by using 4.1 million gallons of storage available upstream in the Smith Street Drain to capture approximately 380 million gallons of overflow annually. This would reduce the number of events to about 15 annually.

To estimate sizes for the two alternatives sites, CSO discharge data from the typical year continuous simulation model were evaluated. These storm events were then tabulated and ranked by total volume. The data show that if events discharging less than 0.57 million gallons could either be captured and returned to the BSA or treated onsite, then the annual number of overflows would be reduced to six per year, based on a typical year. Therefore, CSO mitigation facilities were sized to mitigate CSO discharges with a volume less than or equal to 570,000 gallons. Alternative one (storage tank) was sized to capture this volume and pump this back into the sewer system once capacity is restored after a rainfall event. Alternative two (treatment wetland) was sized to capture and treat an initial CSO volume of 570,000 gallons; however, because wetland processes batch volumes, additional capacity becomes available over time. Therefore, this option is capable of treating back-to-back storm events.

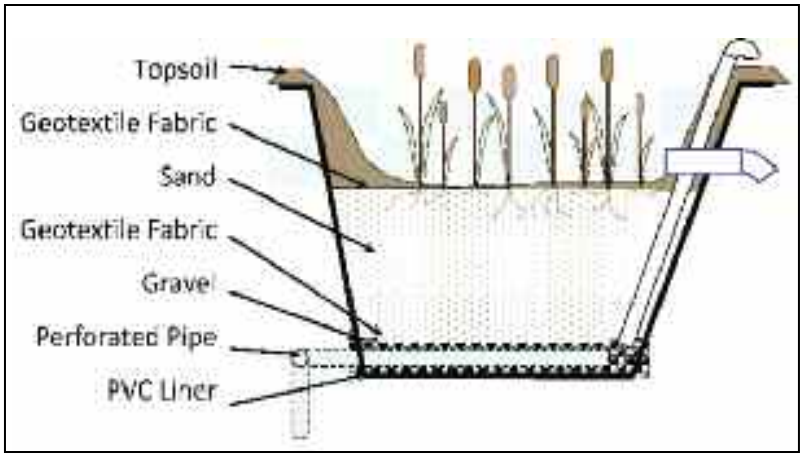

Figure 1. Illustration of a typical vertical constructed wetland cross-section

Constructed Wetland System

The BSA chose to evaluate the innovative use of a constructed wetland system (also known as treatment wetlands or engineered wetlands) to meet onsite treatment goals because these systems offer additional benefits, such as a natural respite for local residents and wildlife and educational opportunities for academic institutions of all levels. These amenities are in high demand in Buffalo's urban environment. Although the implementation of constructed wetlands for CSO management is relatively new in the US, engineered wetland systems have proven to be an effective, low energy, long-term management strategy in a number of European countries, with widespread use in Germany. Some facilities have achieved 90-plus percent removal of fecal coliforms and suspended solids.

The major drawback of constructed wetlands is the large footprint needed for treatment; yet, for the Smith Street Drain, this drawback is beneficial. The Smith Street Outfall is located adjacent to an existing park and undeveloped land adjacent to the Buffalo River. The proposed three-train wetland system and cascade aerator would incorporate local aquatic vegetation and could be easily connected to existing nature trails and integrated into the surrounding landscape. Wetland hydrology would be separated from the surrounding environment using an impermeable liner. Mechanical components such as the settling tank and pumping system would be located underground and therefore not visible to the public ***(Figure 1)***.

An engineered wetland system implemented at the Smith Street site would provide both a CSO management solution as well as a contribution to the base of knowledge regarding the performance and operation of these systems in this country. This type of CSO management system also directly conforms with recent BSA green technology initiatives and promotes partnerships with community stakeholders such as the Buffalo-Niagara Riverkeepers, local neighborhood groups and schools.

Comparing Alternatives

The two management alternatives for the Smith Street CSO have similar control levels (reduction to six overflows per year); however, they have varying degrees of treatment, capacity and ancillary benefits. Alternative one (storage tank and pumping system) is estimated to reduce the annual CSO volume by 12.7 million gallons. This system is not expected to provide additional community benefits outside of the primary project objective for water quality.

The second alternative (onsite treatment wetland system) is expected to reduce the volume of CSOs by a minimum of 12.7 million gallons. However, with the treatment wetland included, there is the potential for an additional 20 percent, or greater, reduction in CSO volume as a result of operational flexibility and storage available within the wetland cells. This alternative has been estimated to cost approximately $3 million more than alternative one. A number of ancillary benefits of this system have been identified:

- Supports the nation's strategy to protect America's waters
- Complies with the goals of the Great Lakes Legacy Act
- Provides restoration of the Buffalo River
- Increases wildlife habitat
- Minimizes the hydraulic load to BSA's wastewater treatment facility
- Provides a regional CSO solution to upstream watershed communities
- Utilizes sustainable materials that could be purchased locally
- Provides operational flexibility while other CSO improvements are implemented
- Offers an innovative low energy use alternative with minimal performance risks
- Provides educational opportunities to the community at elementary through collegiate and professional levels

Cost and Benefit Balance

While the storage tank alternative alone has a lower capital cost, it does not provide the same amount of capture volume and community benefits as alternative two – storage tank with treatment wetlands. However, these benefits come at a substantial cost. While the BSA is currently investigating funding resources to support this additional expense, it is prepared to contribute a portion of the project costs for the benefit of the community. With the overlapping goals of improving a community park and treating a CSO in an ecologically sensitive manner while providing educational opportunities, the BSA is looking to pull from a wider range of funding sources to implement this community project.

David P. Comerford is the Buffalo Sewer Authority General Manager. David Barnes, PE, is a project manager with CRA (Conestoga-Rovers & Associates) in Buffalo, NY and may be reached at: dbarnes@craworld.com.

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Rebirth of Dead River Leads to Great Lake Restoration

by Jill Spisiak-Jedlicka

At the turn of the 20th century, the Buffalo River was bustling with activity as people flocked to what was renowned as the "Queen City of the Lakes." Its shores were lined with oil refineries, steel manufacturing and chemical companies. Jobs were abundant and the economy was thriving. The Erie Canal was bringing business to Buffalo and the river was ideal for safe harbor, Great Lakes transshipment, grain elevators and manufacturing facilities of the industrial and chemical revolution.

Photo courtesy of Buffalo Niagara Riverkeeper

A grain elevator stands in empty silhouette at dusk along the Buffalo River.

Today a much different picture has emerged – the Queen City's riverfront is littered with abandoned factories, 17 mostly vacant grain elevators, car junkyards and brownfields. The Buffalo riverfront has been identified since the 1960s as one of the "toxic hot spots" in the Great Lakes. In 1987, it was officially designated by the US Environmental Protection Agency (USEPA) as one of 43 Great Lakes Areas of Concern (AOC) – 30 of them located within the US border. To date, only one of these AOCs has been delisted – the Oswego River AOC.

More than 100 years after Buffalo's economic boom, most of the industry has vanished, abandoned brownfields are common and many of the surviving businesses have moved out to the suburbs. The only thing that remains of the river's proud industrial history, unfortunately, is a legacy of chemical contamination in the bottom sediments. Among the soup of chemicals that once flowed through this dead river, mercury, lead, polychlorinated biphenyls (PCBs) and polynuclear aromatic hydrocarbons (PAHs) remain.

Largest Great Lakes Cleanup

These contaminants, as well as dozens of other chemical constituents, are targeted for removal from the Buffalo River over the next three years as part of an ambitious, $50 million cleanup effort, the area shown in ***Figure 1***. The goal of the sediment cleanup and accompanying shoreline habitat restoration is to return a 6.2-mile section of industrialized river into a natural resource where both people and wildlife can thrive.

Currently recognized as the biggest cleanup effort in the Great Lakes Basin, the project is being funded by a unique combination of federal, private and nonprofit sources. The first phase of targeted sediment cleanup began in September 2011, with more than 500,000 cubic yards of sediment already being dredged from the river and safely placed in a confined disposal facility. Within the boundaries of the federal navigation channel and funded in part by the Great Lakes Restoration Initiative, dredging is being conducted by the US Army Corps of Engineers.

The second phase is expected to be funded by the Great Lakes Legacy Act, with an agreement expected to be signed among USEPA, Buffalo Niagara RIVERKEEPER® and other nonfederal sponsors. Once a project agreement is signed, the second phase will remove another 400,000 cubic yards of contaminated sediment from areas in the river outside of the navigational channel; cap contamination located at the end of the City Ship Canal; and conduct habitat restoration projects at several locations within and along the banks of the river.

Riverkeeper is the local leader of this unique private-public partnership that includes the USEPA-Great Lakes National Program Office, US Army Corps of Engineers, New York State Department of Environmental Conservation and Honeywell International, Inc. These five entities constitute what is known as the "Buffalo River Restoration Partnership."

Throughout the last five years, these partners have worked together to leverage resources to complete all sampling, analysis, assessments, feasibility study, design and engineering work necessary for remediation. Upon completion, the two phases of dredging will reduce risk associated with human exposure to contaminated sediment and consumption of contaminated fish from the river. The project is also designed to minimize the exposure of wildlife and aquatic organisms to harmful concentrations of contaminants in the sediment, as well as eliminate the future need for confined disposal of

Photo courtesy of Buffalo Niagara Riverkeeper

Figure 1. A Buffalo River Project Map indicates the 6.2 mile area to be affected — yellow indicating dredging, and green indicating habitat restoration.

Photo courtesy of Buffalo Niagara Riverkeeper

Dredging operations taking place in the Buffalo River as part of the largest cleanup project in the Great Lakes Basin.

sediment dredged from the river for routine purposes, such as for navigation.

In addition to the ecological benefits, large-scale cleanup projects like this are important to the Great Lakes region and local economies. The Great Lakes generate 1.5 million jobs and $62 billion in wages. Economic impact studies conducted at a comparable restoration effort in Muskegon, Michigan have demonstrated a 6:1 return on investment.

For decades, Riverkeeper and its supporters have been working toward the goal of cleaning up the river. However, advocates for the Buffalo River were well known as far back as the 1940s. Stanley Spisiak, known locally as "Mr. Buffalo River," even helped change environmental policy in the nation thanks to his passion and commitment to the river. In the early 1950s, Spisiak began to monitor industrial dumping along the Buffalo River. He tested water samples, and found arsenic, cyanide and a suite of chemical contaminants. He also took photos and documented the assault on the Buffalo River and Lake Erie, sometimes literally chasing polluters along the riverbank in the dead of night. He was a "Riverkeeper" before such a term was even coined. He braved multiple threats on his life, was shot at and roughed up for his tireless advocacy and regular testimony on water pollution.

Spisiak is best known for an event that literally changed the course of environmental policy in this country. He went to Washington, DC in 1966 to accept the National Water Conservationist of the Year Award. While there, he was seated next to Lady Bird Johnson. Spisiak took advantage of this opportunity by inviting the First Lady to Buffalo with her husband for a personal tour of the Buffalo River. On August 19, 1966, President Lyndon Johnson arrived at Buffalo Harbor with his presidential entourage, including his wife and NYS Governor Nelson Rockefeller.

In Spisiak's own words: "I showed the President a bucket of sludge and gave him a big spoon to stir it with."

"Who's doing this?" Johnson demanded. "Your Army Corps of Engineers, Mr. President," Spisiak replied. "The Corps is dumping dredge spoils like this all around Lake Erie."

The President's reply: "Those bastards!"

continued on page 37

continued from page 35

Two weeks later, Johnson signed an executive order banning open water disposal of polluted sediments in the Great Lakes, and that order endures to this day.

Today's river restoration project means so much to so many people. But a wider objective sought by Riverkeeper and its partners throughout the Buffalo Niagara region is to create an interconnected system of parks and public places along the water's edge. Community leaders and politicians hope the project is the start of a revitalization of the riverfront, an area plagued by pollution and poor public access for decades.

Water that's drinkable, swimmable and fishable produces immensely powerful pragmatic benefits. Clean water can be an engine for economic recovery. The cleanup and restoration operations alone are already creating jobs. Area citizens know that when the waterways and the shorelines are restored, the communities around them will come back to life too.

Jill Spisiak-Jedlicka is the Director of Ecological Programs for the Buffalo Niagara Riverkeeper in Buffalo, NY. She may be reached at: jedlicka@bnriverkeeper.org.

References

1. http://www.glc.org/announce/11/pdf/Muskegon-Lake-ARRA-econ-fact-sheet_Final_May2011.pdf.

Photo by David Barnes

A barge carries dredge spoils as it travels down the Buffalo River.

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Parker-Fries Interceptor: Wet Weather Management Project

by Kenneth Maving

The Town of Tonawanda is beginning a complex, far reaching and cost intensive program to address its aging sewer infrastructure and to abate numerous sanitary sewer overflows (SSOs) into storm sewers and, ultimately, receiving streams that can occur during wet weather. The town has a relatively flat topography and these critical SSO locations were built with the existing sewers to prevent public health hazards associated with basement backups of raw sewage.

The town's wet weather management plan to cost effectively address sanitary sewer system deficiencies was prepared under its Long Term Control Plan (LTCP), which is currently being revised in consultation with the New York State Department of Conservation (NYSDEC). Based on an extensive analysis performed under the LTCP preparation, the approach involves increasing system capacity to maximize conveyance of wet weather flows for treatment while mitigating the discharge to receiving streams. This would be accomplished by increasing sewer capacity along key interceptors, trunks and local sewers where necessary. A "knee of the curve" analysis, which evaluated the incremental benefit in performance of an alternative with respect to cost, showed that the most cost-effective improvements involve eliminating all SSO discharges for the recommended level of control. The LTCP determined that with infiltration and inflow (I/I) reductions through sewer replacements and separate sewer rehabilitation efforts, SSO discharges would likely be abated during a five-year wet weather event.

The LTCP recommended a five-phase plan aimed at implementing the town's wet weather management improvements to minimize construction and financial impacts to residents of the community. This plan included replacement and upsizing of greater than 150,000 linear feet (lf) of medium to large diameter interceptor and trunk sewers. The NYSDEC has since developed SSO guidance documents that may alter the recommendations in the LTCP. However, Tonawanda is proactively implementing system improvements to mitigate SSOs while the LTCP is negotiated.

Parker-Fries Interceptor Project

The Parker-Fries Interceptor Project is the first phase of the five-phase plan aimed at implementing the town's wet weather management plan to abate SSOs and the associated impacts. The existing Parker-Fries Interceptor currently serves southeastern Tonawanda and terminates at the Parker Pump Station, located on Parker Boulevard, just north of Interstate 290. The Parker Pump Station conveys all wastewater from the Parker-Fries and Colvin-Belmont interceptors in the eastern part of Tonawanda to its wastewater treatment facility. The Parker Pump Station overflow chamber helps to mitigate basement backups during wet weather. When flows exceed the pump station capacity, water levels rise and overflow from the chamber for conveyance to the town's Overflow Retention Facility.

As part of the Parker-Fries Interceptor improvements, the Parker-Fries Interceptor and key tributary trunk sewers will be upsized. This major interceptor is in an advanced state of deterioration and in critical need of replacement. In 2006, a major collapse occurred on the Parker-Fries Interceptor that required a costly repair and could have resulted in significant basement backups. By upsizing the Parker-Fries Interceptor, many SSOs will be abated.

CRA Infrastructure and Engineering, Inc., in Buffalo was selected to develop the comprehensive set of improvements for the Parker-Fries Interceptor Project that would mitigate sewer surcharges and SSOs for the designated level of control. A holistic approach was developed to evaluate alignments, or configurations, that most cost effectively satisfied the project objectives.

Project Alternatives

The improvements presented in the LTCP for all phases were developed at a conceptual level. Therefore, a preliminary analysis was performed to identify potential alignments based on certain criteria for successful construction and implementation. The selected alternative must carefully balance alignment concerns with meeting new capacity requirements. The following potential constructability issues must be carefully considered and addressed:

- Existing Parker-Fries Interceptor alignment
- Utility conflicts
- Parker Pump Station operation
- Subsurface geotechnical conditions
- Impacts to residents

To evaluate the optimal alignment for this project and to verify that obstructions are avoided during construction, AUTOCAD Civil 3D drafting software was utilized. In addition, 3-dimensional soil stratigraphy was used to evaluate the use of trenchless technology versus open-cut excavation for pipe installation to minimize costs and construction impacts.

The Parker-Fries Interceptor Project area consists of mostly residential development, with various commercial, education and religious institutions. The existing interceptor passes along several areas of congested utility piping, particularly the northern end of Fries Road, the Eggert-Fries Road intersection, and along Montrose Avenue. The existing sewer alignment at the pipe sizes and inverts presented in the LTCP report encountered at least seven major utility conflicts. Most of these conflicts were associated with major storm conduits and one was a 48-inch transmission main. The intersection of Parker Boulevard and Woodstock Avenue is currently congested with many buried utilities that include:

- 48-inch storm sewer
- 48-inch Erie County Water Authority transmission mains
- 24-inch Tonawanda water transmission mains
- One oil transmission main
- 16-inch and 30-inch wastewater force mains
- 36-inch Parker Pump Station influent sewer
- 48-inch Colvin-Belmont Interceptor
- Additional private buried utilities

continued on page 44

Map courtesy of CRA, Inc.

The Parker-Fries Interceptor project, which terminates at the Parker Pump Station just south of I-290, calls for key tributary interceptors and trunk sewers to be upsized.

Photo by CRA, Inc.

Installation of 84-inch diameter HOBAS piping by trenchless/pipe jacking method. Shown is the initial setup of the open-faced tunnel boring machine (TBM) and first pipe section for a 300-foot tunnel run.

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continued from page 41

Interstate 290 (I-290) along with a viaduct over Parker Boulevard is adjacent to the pump station, and the upsized Parker-Fries Interceptor must pass under this highway. The expressway has a sound wall on each side as well. In addition, the existing Parker-Fries Interceptor passes through a narrow corridor between the I-290 and a church. Nearby is the large Woodstock Storm Conduit, which receives the SSOs from the interceptor and discharges into Ellicott Creek and then to the Niagara River that would be crossed with the upsized interceptor.

Another concern was that the existing Parker-Fries Interceptor was built under sidewalks in many areas. Residential housing in this part of Tonawanda is close to the street. Installing a much larger diameter pipe under the sidewalk would cause significant impacts, to include existing trees and, therefore, the final streetscape.

Based on these issues, alternative alignments were developed to allow a full range of options to be considered before selecting the final pipe alignment. Because of the complex interaction between the interceptor and its interface with the Parker Pump Station, identification and evaluation of alignments were then divided into two inter-related components: 1) the Parker Pump Station Approach and, 2) the Parker-Fries Interceptor.

The following criteria were critical in selecting the final alignment:

- Minimize the impact to affected residents during construction. Impacts may include closing of residential roads and limiting the access available to local roads and vehicular traffic. Other potential impacts associated with construction include temporary shutdown of water, sewer and other utility service during utility relocations and connections to facilities.
- Maintain operation of the Parker Pump Station and overflow chamber at all times during construction, except for very short, controlled interruptions.
- Minimize interruptions to the existing Parker-Fries Interceptor to the extent possible. Bypass pumping is required for some of the project; however, minimizing the use of bypass pumping would reduce cost and impact as setups are difficult and disruptive on narrow streets.
- Consider impacts to future LTCP phases. In particular, interface with the Parker-Fries Interceptor and 48-inch diameter Colvin-Belmont Interceptor needed to be considered. The Colvin-Belmont interceptor is scheduled for upsizing to 72-inch diameter in a future LTCP phase and lies under either the embankment or shoulder of the elevated I-290. The Colvin-Belmont Interceptor will need to be relocated so the new location of the interceptor connection will be re-established.

The analysis involved evaluating various alternatives to determine the routing that would satisfy the design and alignment criteria while considering the challenges identified. An extensive data collection effort was performed to obtain location and elevation data on sanitary and storm sewers (approximately 540 manholes) in the project area. The data collection effort was able to identify a number of sewers that were not present on existing mapping, and provided storm sewer elevations. Utilities were also contacted to obtain their best information at key locations, especially where Parker Boulevard crosses under the I-290.

The selection of the final alignment took into account the various construction impacts associated with this project. A cost-benefit analysis and value engineering were performed prior to finalizing the Parker-Fries Interceptor project components. The design to upsize the Parker-Fries interceptor and related sewers includes the following components:

- Replacement and upsize of the existing Parker-Fries Interceptor, consisting of approximately 19,000 feet of gravity sewer between 36 and 72 inches in diameter
- Replacement and upsize of approximately 20,000 feet of trunk and tributary sewers between 18 and 42 inches in diameter
- Reroute of a portion of the town sewer system tributary to the Colvin-Belmont Interceptor to the Parker-Fries Interceptor
- Re-establishment of selected SSO wet weather relief points as required to meet or exceed required performance goals
- Installation of flow metering and SSO activation monitoring equipment to provide real-time information to the town's existing SCADA system
- Improvements to the Parker Pump Station influent sewers
- Replacement of the overflow chamber at the Parker Pump Station
- Hydraulic modeling to verify that recommended improvements meet required system performance criteria
- Outreach program implemented to inform the public of the need for this project and communicating construction impacts to local residents

Due to the size, complexity and cost of the project, the Parker-Fries Interceptor Project was split into four phases with implementation over approximately seven years. The Town of Tonawanda applied for funding through the New York State Environmental Facilities Corporation (NYSEFC). In late November 2009, it was determined that Phase One of the project qualified for interest-free short-term financing, as well as a 50 percent interest rate subsidy on long-term financing through NYSEFC. In addition, the town received a grant in the amount of $4 million from the Clean Water State Revolving Fund (CWSRF) in July 2010.

Public Awareness

Construction of the Parker-Fries Interceptor Project has a substantial impact on the residents, motorists and businesses located along the pipeline route. These impacts, as already mentioned, include closing of residential roads and limiting the access available to local roads and vehicular traffic. Therefore, the town developed a public outreach program to convey the need for this important project and communicate construction impacts to local residents. The town held the first public information meeting in March 2010. The purpose of this meeting was to make residents aware of various construction activities anticipated throughout the two-year project. A preliminary construction schedule and various informational resources available to town residents were presented. Prior to the start of construction activities, a second public information meeting was held. This meeting discussed the anticipated construction schedule and locations, preliminary traffic impacts and other items that residents may observe during the project. While construction was ongoing, a third public information meeting was held to discuss specific construction activities completed and future activities scheduled.

The goal of these meetings was to keep the local public informed and mitigate the impacts that affect residents during construction. A project website and construction informational phone line was developed to apprise residents of important information. Coordination with the town and Erie County Highway departments, police department, school districts and the Niagara Frontier Transportation Authority (NFTA) has been critical in minimizing disruption to residents.

continued on page 47

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Photo by CRA, Inc.

The removal of a 30-inch diameter shaft casing used for installation of the 40-foot long soldier piles for an overflow chamber, a project component, within a residential neighborhood.

Status of Project Phases

LTCP Phase 1: Parker-Fries Interceptor Project Phase 1 includes installation of approximately 4,500 feet of 84, 72 and 48-inch diameter sewer pipe by tunneling, and 5,500 feet of 48 and 30-inch diameter sewer pipe by open-cut method. Also included is the installation

continued from page 44

of approximately 6,000 feet of water main replacement along Parker Boulevard. Once the NYSDEC approved project plans and specifications, advertisement for bids occurred in February 2010. Kandey Company, a local general contractor, was awarded the project in May 2010 for approximately $26.5 million. Construction for Phase 1 began in June 2010 and the project is expected to be completed in June 2012.

LTCP Phase 2: Parker-Fries Interceptor Project Phase 2 includes more than 10,000 linear foot of new gravity sewer ranging from 10-inch to 30-inch diameter. The project also includes the rehabilitation of approximately 2,500 feet of 10-inch and 30-inch sewers. The project has an estimated cost of $17 million and was advertised in December 2011, with construction expected to commence in Spring 2012.

LTCP Phases 3 & 4: Parker-Fries Interceptor Project Phases 3 and 4 will be finalized and proceed after completion of the Phase 2 improvements.

Tonawanda's program to address its aging infrastructure and to abate numerous SSOs that can occur during wet weather is well underway. Communications with all stakeholders has been critical to the success in implementing the early stages of the town-wide wet weather management program.

Kenneth Maving is the Town of Tonawanda Director of Water Resources and serves as NYWEA Western Chapter Director. He may be reached at: kmaving@tonawanda.ny.us.

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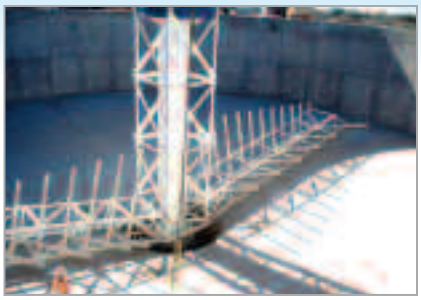

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Inter-Municipal Cooperation Generates Solids Handling Solution

by Jeffrey Angiel, David P. Comerford and Roberta L. Gaiek

Since 1998, the 36 mgd (million gallons per day) Town of Amherst Water Pollution Control Facility (WPCF) had been drying residual biosolids and producing fertilizer granules (pellets) for retail distribution. While the product was realizing progress in its marketing and distribution, in recent years the infrastructure in place to produce the dried pellets was aging. When the drum drying system neared the end of its useful life, Amherst began performing an assessment of its options for solids handling and disposal of its 2,900 annual dry tons of sludge.

The 180 mgd Buffalo Sewer Authority (BSA) plant, located approximately 15 miles southwest from the Amherst plant, incinerates its wastewater treatment sludge utilizing three multiple-hearth incinerators. The facility is regulated under a USEPA Title V Air Permit. Under this permit, each of the three incinerators has a capacity of 60 dry tons per day (dtpd). Recent operational changes at the facility as well as upgrade projects on the anaerobic digesters and sludge dewatering process at the BSA have increased the performance and efficiency of the solids handling processes and improved the quantity and quality of sludge conveyed to the incineration process. Since the incorporation of these changes, the BSA has been operating one incinerator at about half of its design capacity. This has enabled the BSA to offer available incineration capacity to Amherst while still maintaining a one incinerator operation.

Project Awarded NYS Grant

In 2008, Amherst and BSA officials collaborated and jointly received a $400,000 Shared Municipal Services Grant from the New York State Department of State to help defray the $3 million required for studying, designing and constructing new facilities to offload and receive sludge cake, respectively. After several months of studies, planning and regulatory review, the BSA and Amherst signed an inter-municipal agreement for Amherst to truck a dewatered, undigested, 30 percent solids sludge cake to BSA for processing and ultimate disposal.

The implications of this agreement were significant to both entities. Eliminating the drum drying system at Amherst will also enable it to mothball its two anaerobic digesters, which had been an operational process bottleneck at the facility for many years. Amherst will then see a significant reduction in labor, maintenance, electricity and natural gas usage costs in future years. Simplifying the solids handling operation was the goal of plant administrators who aimed to reduce the legacy costs of the solids handling operation.

The BSA is constructing a new cake receiving station to accept Amherst's sludge and is designing systems which will increase operational flexibility. When the project is completed, the BSA will have the capabilities of either digesting trucked sludge cake to increase its methane gas production, or incinerating the higher volatile solids content sludge directly. The BSA stands to generate a new revenue stream by accepting Amherst's sludge which results in more methane gas for use in onsite equipment and additional waste heat from the incinerators used for fuel. The WWTP also has the potential of becoming a regional solids handling facility offering similar services to other local wastewater treatment plants.

Amherst's Benefit Analysis

On the surface, the decision to shut down the fertilizer production operation at Amherst may appear to be environmentally unfavorable. However, the results of Amherst's carbon footprint project analysis drew a positive conclusion. All of the identified 13 options for Amherst's solids handling operation were evaluated using estimated carbon dioxide equivalents released to the atmosphere or "carbon footprints." Estimated greenhouse gas emissions were calculated using the Biosolids Emissions Assessment Model (BEAM) developed

continued on page 51

Sludge trucked to the Buffalo Sewer Authority will be distributed to this conveyor belt system at which staff will determine whether it will be processed through incineration or through the rewetting system.

The Buffalo Sewer Authority's dewatering centrifuge removes unwanted wastewater from sludge prior to being conveyed to the incinerator.

Photos by Buffalo Sewer Authority

continued from page 49

by the Canadian Council of Ministers of the Environment. The factors utilized in this modeling tool consider the usage of electrical energy, natural gas, diesel fuel and polymers. The conclusion of Amherst's analysis indicated the regional (BSA) incineration alternative was second only to a composting alternative.

Amherst also performed a Net Present Worth (NPW) analysis of the options identified in the study. Factors considered included electric usage, natural gas usage, materials usage, transportation costs, disposal costs, labor components and capital investments required for each specific alternative. The 20-year NPW analysis indicated the regional incineration alternative at BSA to be preferable over the next closest alternative by a comfortable margin of $5.1 million, or a 30 percent savings over 20 years.

Regional Benefits

The Buffalo Sewer Authority's intention with the construction of a sludge cake receiving system is to extend its existing excess incineration capacity to other outlying facilities in the Western New York area. While the BSA incinerates its municipal sludge, most other wastewater facilities in the local area landfill their sludge. This approach will assist other municipalities in reducing their residual solids disposal costs as the BSA option offers residual solids disposal at lower costs than landfilling.

Looking for support for the project, an initial engineering study was performed by Malcolm Pirnie, Inc. to evaluate the impact of, as well as the alternatives for, receipt and processing of imported sludge cake. A number of key issues were taken into account during the performance of the study, including the existing Facility Title V Permit thresholds, best alternative for acceptance and conveyance of sludge cake, estimate of probable cost (capital and O&M), and a financial analysis to determine if a sludge acceptance method exists that would be beneficial to both the BSA and Amherst, along with other possible outside customers.

The final recommended alternative includes a twofold option for acceptance and direct conveyance of the imported sludge to the incineration process; or acceptance, rewetting and transport of undigested sludge cake to the anaerobic digestion process. The imported sludge will prove to be an aid to the BSA as a fuel source in the incineration process or as feed source for methane production. The main components of the cake receiving system include a live bottom sludge hopper, a sludge cake pumping system and a sludge rewatering system.

Photo by Buffalo Sewer Authority

Recent operational changes, as well as upgrades to the anaerobic digesters and sludge dewatering process at the BSA, have increased the performance and efficiency of the solids handling processes, thereby improving the quantity and quality of sludge conveyed to the incineration process. An onsite incinerator used is seen here.

The sludge cake rewatering system will use water activated sludge to dilute the undigested sludge cake to a target of six to eight percent total solids and conveyance of that sludge to thickened sludge lines

continued on page 52

Photo by Buffalo Sewer Authority

The sludge cake rewatering system will use waste activated sludge to dilute the undigested sludge cake to a target of six to eight percent total solids, and then convey that sludge to thickened sludge lines feeding the BSA anaerobic digesters, seen in this photo.

continued from page 51

feeding the anaerobic digesters. An inline sludge cake grinder and separate sludge rewatering tank will be used to dilute the sludge cake.

The BSA's existing truck weighing scale will be rehabilitated to "like new" condition and a sludge cake receiving station will be incorporated for monitoring sludge cake receipt onsite. The operation of this system will include the driver obtaining a driver-specific identification card when to check into site security. This card will be initialized when the truck is first weighed at the truck scale and the driver swipes his/her card. The card will then be used to initiate opening of the door covering the cake hopper, allowing the sludge to be discharged to the cake hopper.

The BSA operation staff will have previously been notified that the trucker is onsite and the staff will make the decision of whether the sludge will be conveyed to incineration or through the rewetting system. The trucker will weigh the truck before leaving the facility site. Truck information will automatically be conveyed electronically to the BSA and will be used for developing invoices for each load.

The construction of this project is well underway. The construction cost is $2.28 million with the majority of the costs associated with the sludge cake hopper and sludge conveyance to the incineration process.

Opportunity for BSA

Embarking on this project comes at an opportune time for the BSA. In these cost-conscious economic times, and with significant future collection system improvements on the horizon, the ability to utilize the available capacity of its infrastructure to generate new revenue streams will aid the BSA's bottom line.

In the future, the BSA will look to continue to optimize capacity and transform into a regional sludge handling facility providing similar services to other municipalities. Preliminary discussions have begun with other neighboring service providers. The real winners of this project are the ratepayers and residents of both Buffalo and Amherst. This cooperation enables both entities to provide high quality services while enjoying the financial benefits of the improved economies of scale.

This type of inter-municipal arrangement had not yet been accomplished in NYSDEC's Region 9, and some obstacles and resistance were encountered in the planning and development phases of this effort. However, the resilience and perseverance of both parties for a mutually beneficial project proved successful. The Amherst WPCF and the BSA WWTP are in the construction phase of this solids handling project, with a completion date expected in September 2012.

Jeffrey Angiel is the Town of Amherst Assistant Municipal Engineer and may be reached at: jangiel@amherst.ny.us. David P. Comerford is the Buffalo Sewer Authority General Manager. Roberta L. Gaiek, is the BSA Plant Administrator and may be reached at: robbie@sa.ci.buffalo.ny.us.

Home to Nation's Oldest Sewer System – Legendary Chautauqua Institution and Village

by Tom Cherry

Welcome to the Chautauqua Utility District (CUD), serving the internationally renowned Chautauqua Institution on the shores of Chautauqua Lake in southwestern New York!

The CUD can proudly boast that since 1893 it became the oldest completely sewered community in the country. It was a pioneer in mandating that every structure in the Village of Chautauqua be connected to the sewer system. The facility has been continuously-upgraded since – from the construction of a chemical precipitation wastewater treatment plant in 1898, to the installation of a new rotating biological contactor treatment plant in 1978. Although the CUD has undertaken many improvements since the early days, a few things remain unchanged, such as the use of some original 1890-era tanks as primary clarifiers.

Something else that will remain constant and paramount is the district's concern for water quality.

Photo courtesy of CRA, Inc.

A secondary clarifier tank next to the rotating biological contactor building at Chautauqua Utility District's wastewater treatment plant, adjacent to Lake Chautauqua

Treatment Operations

The original wastewater treatment plant (WWTP) was comprised of five Imhoff tanks. Today, the CUD WWTP consists of coarse screening and grit removal followed by two parallel treatment trains, each with one 30,000-gallon primary clarifier, and one two-stage rotating biological contactor and a 35,724-gallon secondary clarifier. Treated effluent is disinfected with sodium hypochlorite prior to discharge to Chautauqua Lake. Solids and sediment are hauled to the nearby Jamestown Board of Public Utilities WWTP for processing.

Treated effluent quality is generally considered excellent as the plant has been compliant with its discharge permit for 33 years and there is sufficient capacity to accommodate future growth. The WWTP is designed to process 840,000 gallons per day (gpd) of influent sewage but the average daily flow during the nine week Chautauqua Institute's summer programming season is about 500,000 gpd. Non-peak season flows are much lower.

Chautauqua Institute's Seasonal Impact

With more than 170,000 visitors staying at the Chautauqua Institute during the nine week summer program period, the CUD's biggest challenge is addressing seasonal variability. From fall to spring, the plant operates two process trains treating the waste from the approximately 400 year-round residents and due to infiltration and inflow (I/I) from snow melt and rains. During peak season, a second train is placed online and a summer intern is typically hired to assist the two person, year-round crew. Concerns that plague other municipalities, such as odors, have been addressed at the CUD WWTP over the years. Although the plant is located adjacent to a new sailing school, the facility has managed to control odors and complaints about odors through the use of a wet chemical scrubber along with exhaust hoods placed above the clarifiers.

Photo from www.ciweb.org

The Chautauqua Amphitheater where audiences gather each summer to hear legendary scholars and entertainers

Chautauqua Lake, the plant's receiving water body, has some of the best muskie fishing in the world and is one of the jewels of New York State. It is part of the Ohio River watershed. The lake discharges to the Chadakoin River, which joins Cassadaga Creek and then Conewango Creek and, lastly, the Allegheny River. The Chautauqua area welcomes visitors year round and offers everything from fine dining, locally made wines and, of course, water recreational activities.

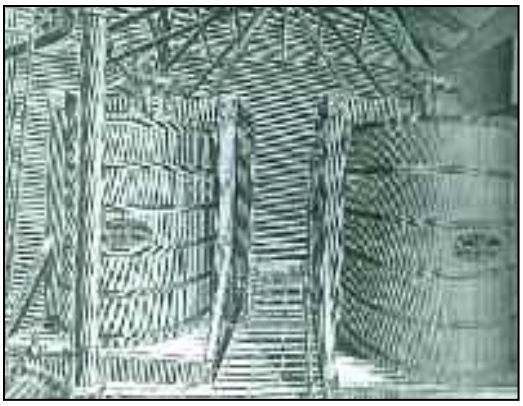

Image courtesy of Chautauqua Utility District

Wooden tanks, circa 1898, comprise the first operational treatment plant or simple sequencing batch reactor at Chautauqua, NY.

Tom Cherry is Chautauqua Utility District Operations Superintendent, in Chautauqua, NY.

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SPOTLIGHT on …
Buffalo State and its NYWEA Student Chapter

by Kim N. Irvine

Buffalo State is a four-year liberal arts and sciences college that is one of 64 campuses within the State University of New York (SUNY) system. With more than 426,000 undergraduate students system-wide, SUNY is the largest state university system in the nation. Located in the urban center of Buffalo, the Buffalo State campus enrolls 11,700 students. Buffalo State offers 165 undergraduate programs and 62 graduate programs (including 18 post-baccalaureate teacher certification programs).

Great Lakes Center

With its proximity to Lake Erie and the Niagara River, Buffalo State has had a long and rich history of Great Lakes research and education, led by the Great Lakes Center. First established as the Great Lakes Laboratory in the 1960s under the leadership of Dr. Robert Sweeney, the center has flourished and today maintains a state-of-the-art field station with a fleet of research vessels and laboratories under the directorship of Dr. Alexander Karatayev.

Historically, there have been three important research and education elements at the center – aquatic ecology, environmental toxicology and watershed resources. A focal point for the watershed resources and aquatic ecology initiatives since the 1980s has been the Buffalo River Area of Concern, as Buffalo State faculty and students have teamed with a number of federal, state and local agencies, other universities, consulting firms and not-for-profits to help develop and implement remediation plans. In particular, Buffalo State has been involved in numerous combined sewer overflow abatement studies that include water quality monitoring and modeling.

Campus Stormwater Green Plan

The interest in stormwater impacts also has extended to the campus facilities and master plan. Through the Environmental Health and Safety Office, the campus has developed and begun to implement green infrastructure projects to help manage its discharges to Scajaquada Creek. These projects include green roofs for the new Science and Technology buildings, more green space, vortex separators to remove solids, and stormwater detention ponds. The Environmental Health and Safety Office sponsored a number of research projects to assess the efficacy of some of these stormwater management technologies.

Center for SE Asia Environment and Sustainable Development

More recently, Buffalo State's interest in water has gone international through the Center for Southeast Asia Environment and Sustainable Development, whose mission is to improve the understanding of complex environmental and development issues facing Southeast Asia by fostering multidisciplinary, international collaboration in research and education.

Major projects have included conducting an assessment of Phnom Penh's natural wetlands in treating the city's waste; modeling the sewer system of an urban area of Bangkok to provide recommendations in alleviating flooding; monitoring water quality on the Tonle Sap Lake and Mekong River system; assessing land use impacts on water quality draining from a black water peat forest in rural Malaysia; and, developing online educational modules related to integrated water resources management. Affiliated faculty also have conducted a number of capacity building workshops in Cambodia related to surface water quality assessment, drinking water quality, pesticide use and the GIS (Geographical Information System).

Photo by Kim Irvine, PhD

Sampling stormwater quality to assess the efficacy of a vortex separator on the Buffalo State campus

NYWEA Student Chapter

In light of Buffalo State's interest in water resources, a student chapter is currently being formed to enhance student connections to the profession. Starting with 15 students in Fall 2011, activities have included a project that examined water trading rights and opportunities in Fort Erie, Ontario; and fundraising to help reconstruct laboratory facilities at the Asian Institute of Technology and for those made homeless by the recent catastrophic flood in Bangkok.

The NYWEA Student Chapter members will present the results of their various water resource projects at a poster session during the Greater Buffalo Environmental Conference, March 27, 2012 and possibly at the NYWEA Spring Conference this June in Buffalo. This marks the first time that students have presented work in this forum and it is expected to become a strong tradition for future generations of students.

Kim N. Irvine, PhD, is a professor in the Department of Geography and Planning and for the Great Lakes Center at Buffalo State – State University of New York in Buffalo, NY. Dr. Irvine is a NYWEA member and faculty advisor for the student chapter. He may be reached at: irvinekn@buffalostate.edu.

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www.co.chautauqua.ny.us

click on "Civil Service/Employment Opportunities"

Visit nywea.org for more job openings.

Letter of Interest

Hygiene's Importance Missing in *Clear Waters'* Safety and Health Edition

Dan Bentivogli

Letter to the Editor:

Thank you for the generally excellent and thoughtful health and safety Winter 2011 issue of *Clear Waters*. However, only once in the magazine (page 32) is the issue of hygiene brought up – and then only ninth out of ten of a Top Ten list. Along with slips and trips, hygiene in wastewater treatment is one of the primary issues facing operators, maintenance personnel and lab workers.

In an instructional manual for operators, the Pennsylvania Department of Environmental Protection writes: "… workers at WWTPs should wash hands frequently with anti-bacterial soap, …" (Tips for Staying Healthy, 2009). This is in addition to, "Avoid direct contacts with wastewater – always wear gloves." Yet, nowhere in this issue are workers to be seen wearing gloves. In fact, many operators still think they can assess the dryness of sludge with bare hands (you can't). In fact, there is no job in a WWTP or collection system that should be performed without protective gloves.

Furthermore, from the DEP: "It is suggested that work clothing for wastewater workers be washed on site, it IS NOT [emphasis in the original] recommended to bring sewage contaminated clothing home. Let your work clothing (and boots) remain at work. Bringing contaminated clothing home can expose family members to pathogens. *It is also recommended that you take a shower at the end of a shift* [my emphasis]." We should remember many cases of malignant asbestosis struck family members of asbestos workers who brought the fibers home from work. The trunk of your car is not an answer either – where do you load the groceries? If you work at a modern landfill, you would remove your clothing at the start of a shift in a locker room, walk through a shower room and don appropriate personal protective equipment. The process is reversed at the end of the shift. Wastewater workers need to be as vigilant.

Jorgen Thorn and Erika Kerekes, in the *American Journal of Industrial Medicine* (2001) point to evidence that, "gastrointestinal tract symptoms are more common among operators as well as respiratory distress symptoms." The writers also suggest that operators are at risk for hepatitis. All of these diseases are preventable with proper maintenance and hygiene.

John Lafleur and John Vena, also in the *American Journal of Industrial Medicine* (1991), point to increased danger and mortality from "malignant neoplasms… compared to all other workers." (Disclosure: I participated with this study.) Simply put, why would we take this risk?

Bacteria in wastewater treatment belongs in pipes and tanks, not on workers. This should be a paramount health and safety issue.

Dan Bentivogli
CRA (Conestoga-Rovers & Associates), Buffalo, NY

NOTE: The NYWEA Publications Committee, which decides editorial content for Clear Waters, regrets an article was not devoted to this particular safety and health topic of importance to New York State's wastewater industry employees. We thank Dan Bentivogli for his input on this subject to benefit our readers.

People & Places

Shannon Walters Joins Barton and Loguidice

Shannon L. Walters, PE, joins Barton and Loguidice, PC, as a Managing Engineer in the firm's water/wastewater group at its Syracuse office. A resident of Camillus, NY, Walters previously owned her own consulting firm, Sage Stone Engineering, where she provided a range of municipal services including general consulting to villages, towns and local planning boards; engineering studies; and project design and bidding services for water, wastewater and storm sewer projects.

Shannon L. Walters

Walters earned her BS in Chemical Engineering from Clarkson University, and her master's degree in Environmental and Water Resources Engineering from the University of Texas at Austin. She has more than 12 years of experience in the areas of water supply, wastewater treatment and disposal, storm drainage and erosion control, commercial and residential land development, and environmental permitting.

Walters has published and presented her work, and is a member of New York Water Environment Association and American Water Works Association.

KUDOS

Congratulations Newly Certified Operators! January – February 2012

Name	Grade
Gary Allen, Jr.	1
Darrell Arnold	2
John Stephen Chierico	3A
Anthony J. Croce	3A
James D. David	2A
Angelo Delmonaco	3A
Ronald B. Dernbach	3A
Andrew Dickson, Sr.	2A
Allan Drosendahl	1
Keith P. Geraldsen	2A
Matthew R. Ilardi	3A
Brian Jackson	1
Jeremy L. Jacot	2A
David E. Jones	3A
Steven F. Lafaive	3A
Brian Nephew	2A
Patrick J. O'Leary	2A
Fernando D. Seminelli	2
Richard T. Simon	3A
Jordan Springer	1
John Thomas, Jr.	2A
Jeffrey Waterman	2A
Michael Weber	1
Charles Webster	1
Lawrence W. Williams	2A
John Wintersteiger	1

In Memoriam

Robert Armstrong

NYWEA Western Chapter members and acquaintances around the state are saddened by the passing of Robert (Bob) Armstrong. Armstrong was the Business Group Manager in the Amherst office of GHD (formerly Stearns & Wheler). He was a strong supporter of the association, and a friend and mentor to many Western Chapter members. He showed strong leadership when he stepped up to chair the 2006 Scholarship Fundraiser in Canandaigua. He had a unique leadership style that was greatly admired and is surely missed.

Armstrong had more than 26 years of experience in the field of wastewater and water infrastructure engineering for GHD Inc. He was involved in the study, design, and construction of many projects, primarily with water and wastewater treatment and conveyance. As Business Group Leader for Infrastructure, he was the technical leader for GHD's infrastructure-related projects. Armstrong was also recently elevated to Business Group Leader for the Great Lakes Region, which involved business development and production responsibilities across multiple states.

Armstrong graduated from Clarkson University, where he was the captain of the hockey team. He holds both bachelor's and master's degrees in civil and environmental engineering and was a Registered Professional Engineer for the State of New York, as well as a Board Certified Environmental Engineer as a member of the American Academy of Environmental Engineers. In addition to NYWEA, he was involved with various organizations, including the Water Environment Federation, American Public Water Works Association, American Society of Civil Engineers and the National Society of Professional Engineers.

Remembered as a gentleman and devoted family man, Armstrong was greatly involved in the sports activities of his children. He was the assistant coach of the Clarence High School hockey team and coached the Buffalo Regals and Wheatfield Blades travel hockey teams. He was the head coach for the Clarence travel baseball, assistant coach for the Southtowns Knights and New Era travel baseball teams, and head coach and league coordinator for the Clarence girls softball.

Armstrong is survived by his wife of 25 years, the former Joanne Druyff, a daughter, Lauren, and two sons, David and Mark. He is also survived by his parents, Donald and Ann; a sister, Karen Gorsky; and four brothers, Richard, Donald, James and Steven.

John Neske

It is with great sadness that we report the passing of John Neske. John Neske began work with the New York City Department of Environmental Protection in April 1993, first as a sewage treatment worker and earned promotions throughout his career to become Stationary Engineer Electric. He worked at Bowery Bay, Collection Facilities North-Wards Island and Collection Facilities South-Gowanus. His last responsibility included the supervision of a staff of 15, operating and maintaining 16 wastewater pumping stations, two inflatable dams, one aeration facility, the Gowanus Flushing Tunnel and 80 regulators. He also supervised a vactor truck crew. Neske and his crew responded to the flooding that occurred in upstate New York after Hurricane Irene as well as assisted the Mahopac Wastewater Treatment Plant with an emergency repair.

Neske and some colleagues competed in the NYWEA Operators Challenge for the first time in 1996. The group was known as the Bowery Bay Bowl Busters then. In the five years the members competed together, they won the NYWEA Metropolitan Chapter event twice and the statewide event twice. Neske continued on competing or judging the events right up until last year.

A career colleague, Chris Laudando, said of John: "He was known for his amazing ability to say the perfect thing at the perfect time with razor sharp comedic wit. He would be able to read the day's stresses on a colleague's face and ask, 'what do ya need?' or, 'I'll take care of it.' He took pride in his work and shared what he had learned and experienced with the next generation of operators. He was not just a supervisor but also a mentor who possessed a friendly, at-ease quality that made him an exceptional supervisor. NYWEA and NYCDEP lost a great man that day, but those who knew him, like I did, lost a brother."

He recently celebrated with great pride his daughter, Kayla's, sweet 16 birthday. He is survived by his wife, Kathy, and daughter Kayla of

The original Bowery Bay Bowl Busters at an early Operations Challenge event: (l–r), Chris Laudando, John Neske, Frank Giovaniello and Frank Soviero.

Spring 2012, Vol. 42, No. 1

Clear Waters

New York Water Environment Association, Inc.

ADVERTISERS	PAGE
AECOM	29
Aftek, Inc.	36
Aqua-Aerobic Systems, Inc.	42
Barton & Loguidice, P.C.	62
Black & Veatch	37
C&S Companies	35
CDM	17
Conestoga-Rovers & Associates	31
Degremont Technologies	58
Dvirka and Bartilucci	28
Franklin Miller	45
GA Fleet	14
Gehring Pumps, Inc.	46
GHD	41
G.P. Jager & Associates	11, 24, 38, 39, 55
Greeley and Hansen	52
H2M	62
Hatch Mott MacDonald	19
Hazen and Sawyer	18
Holland Company, Inc.	35
Koester Associates, Inc.	Inside Front Cover, 22, 43
Lakeside Equipment Corp.	33
J. Andrew Lange, Inc.	26
Malcolm Piernie, The Water Division of ARCADIS	56
Mixing Systems, Inc.	Inside Back Cover
O'Brien & Gere	37
Passaic Valley Sewerage Commissioners	31
Pumping Services, Inc.	50
Savin Engineers, P.C.	46
Siewert Equipment Co. Inc.	Back Cover
SJE-Rhombus	26
Smith & Loveless Inc.	46
Trojan Technologies	53
Vogelsang	47
WesTech Engineering	48

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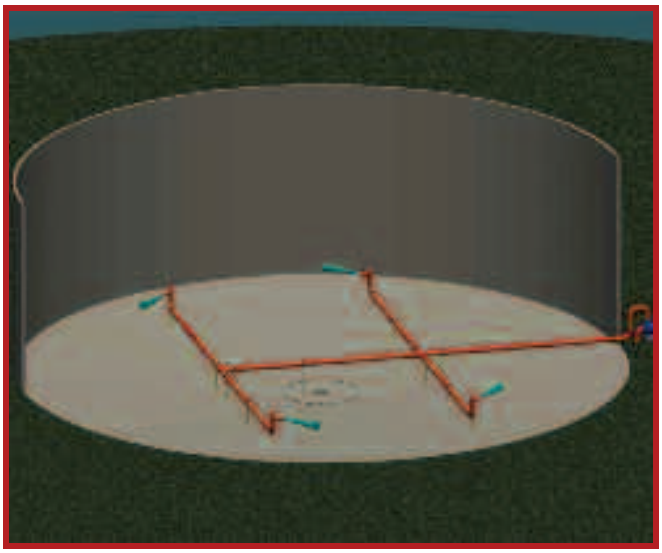

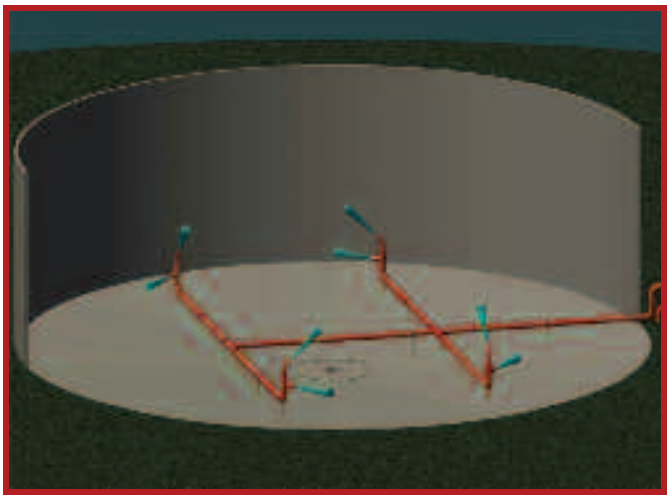

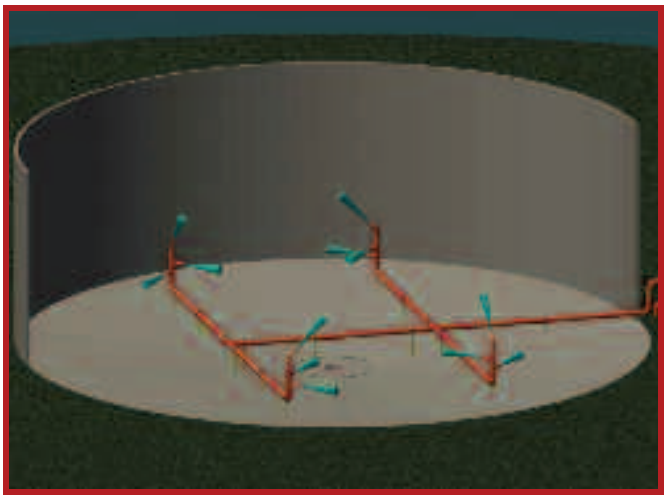

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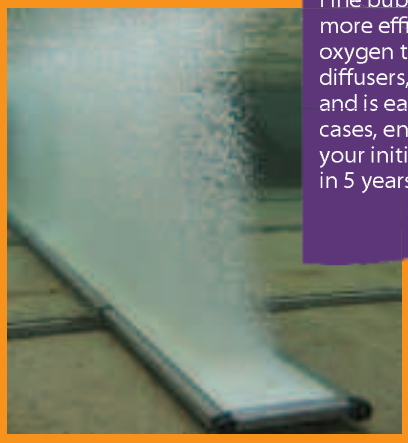

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