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DOWRA NEWS

Delaware On-Site Wastewater Recycling Association

Issue 2

July 2011

In this Issue!

Sustainability. By definition it means improving the quality of human life while living within the carrying capacity of supporting eco-systems. Many of us hear this word daily, but probably don't think twice about how it relates to the wastewater industry.

As industry professionals, it is our responsibility to design, construct and maintain systems that protect the groundwater, surface water, and land around us for today and our future. We must be cognizant of wastewater loadings, and at the same time being aware of the carbon footprint our businesses create.

How can we design better systems, construct systems that can be better maintained and operated, reduce air emissions, and provide greener solutions within our day to day activities to help our environment?

This issue is dedicated to providing you with ways in which "green" and "sustainable" practices and technologies have been incorporated into our onsite industry. It is geared towards generating discussions in hopes of changes that could be implemented into your business. Being sustainable usually isn't the cheapest, or quickest fix to a problem, but one that will guarantee a better tomorrow for us all.

Annual Conference Fast Approaching

HOLD THOSE DATES!

DOWRA's 15th annual conference, "Making a Difference" will be held on October 11 & 12, 2011 at the Dover Downs Conference Center and Casino. The conference hosts over 300 attendees comprised of local, regional and national on-site industry representatives, and provides a two tract presentation schedule.

Currently, we are seeking presenters and exhibitors !If you are interested in registering, please visit our website at www.dowra.org and download the registration form. Attendee registration will follow in early September. We look forward to seeing you there!

Incorporating Direct Reuse into Water Recycling Projects- By Donald C. Shields, P.E., Applied Water Management, Inc.

In Delaware, continued growth puts a strain on the water supply due to increasing groundwater withdrawals, and also presents challenges to the wastewater infrastructure. As development continues to proceed, the use of water recycling systems to alleviate wastewater system demands and to provide groundwater recharge (or indirect reuse) is becoming more important. But incorporating direct reuse projects are another increasingly important practice in total water management, to further help protect water supplies by reducing the amount of potable water used for these applications.

In suburban areas and small cities, reclaimed water can be considered for direct uses such as cooling towers, flush water, and other industrial uses.

For example, in New York City, American Water's Applied Water Management Group is working with developers at six separate locations in Battery Park City to design, manage construction and operate state-of-the-art water recycling programs for direct reuse applications. The company's first project was The Solaire, the nation's first sustainable residential high-rise, in 2000. Programs followed at four other "green" high-rise condominiums, Tribeca Green, Millennium Towers, The Visionaire and Riverhouse, which are all complete and in operation.

Together, these Battery Park residential systems save an average of 10 million gallons of potable water per building per year. Each of these systems is designed to collect and recycle black water and storm water for reuse in cooling towers and as flushwater, and some of the buildings also use the recycled water for irrigation and common laundry facilities. Each treatment plant uses an industry-leading membrane filtration technology to separate waste from the water, providing a high-quality effluent. Domestic wastewater entering the system is subject to a rigorous biological treatment process, using hollow fiber micro-filtration membranes, treatment with ultraviolet light to kill bacteria, and both oxygen-based and non-oxygen-based treatment to remove nitrogen to comply with New York's direct reuse standards.

Every system is inspected twice a week, and is subject to quarterly preventive maintenance checks. The treatment and recycling plants are also highly automated. In case of an imbalance or unanticipated disruption, the Applied Water Management team receives a direct alarm notice and an operator on call is immediately dispatched to handle the issue.

Following the success of these developments, a combined water recycling program at two new buildings, Liberty Green and Liberty Luxe, is being developed by Applied Water Management and is scheduled for completion in 2011.

New York City provides incentives for reducing potable demand, which further benefits the economics of these systems for developers. The city provides each building with a "credit" on its water and sewer bills, since the facilities are not relying on the city's systems.

Another example is Gillette Stadium, the home of the New England Patriots, which would not have been built in Foxborough, Mass. without the water reuse system put into place by Applied Water

Incorporating Direct Reuse Into Water Recycling Projects-Continued

Management group. The town wanted the notoriety and economic benefits that the stadium and the adjacent family entertainment complex, Patriot's Place, would provide, but its infrastructure was incapable of handling such an expansion of demand on potable water, and there is no public sewer system to manage the wastewater produced.

Applied Water Management created a self-contained water reuse system that reclaims approximately 75% of the total flow for reuse at the stadium complex and even more since Patriot Place has been added to the system. It recycles wastewater for flushing toilets, cooling facilities and other purposes. Recycling as much as 15 million gallons of water each year, it is the largest project of its kind in New England.

In Delaware, this same membrane bioreactor technology is already being used in two residential developments, Bayfront and Hart's Landing, both of which discharge high-quality effluent (less than 5 ppm total nitrogen) into the groundwater, which ultimately flows into the Inland Bays Watershed. These plants treat for total nitrogen amongst other pollutants, and the discharge water produced far exceeds the state's stringent reuse guidelines.

These two reuse systems could be expanded for direct reuse purposes that would provide even greater benefits to the region. For example, Hart's Landing already incorporates drip irrigation as part of its indirect reuse system – why not consider expanding it to include a community irrigation system? Another example would be to install double-piping systems in both developments to enable the use of effluent for flushing toilets?

These and other projects across the country serve as models for communities looking to implement direct reuse to help ease the burden on existing infrastructure and water supply demands. Delaware is already part of the reuse movement, and our industry can continue to support growth in the state through the increased use of indirect and direct reuse projects.

Donald C. Shields is vice president and director of Technical Services for Applied Water Management, Inc., which provides customized water and wastewater management solutions to real estate developers, industrial clients, and small to midsized communities. The company is a wholly owned subsidiary of American Water (NYSE: AWK), the largest publicly traded U.S. water and wastewater utility company.

***“Delaware is
already part of
the reuse
movement”***

Sustainability a Top Priority in Kent County– By Dan String, P.E.

Kent County owns and operates a 16.3 MGD advanced wastewater treatment facility located just outside Frederica, Delaware. Once the City of Harrington is connected to the system later this year, the facility will provide treatment of wastewater for all major municipalities within the County as well as parts of New Castle and Sussex County. Treated effluent is discharged to a tributary to the Murderkill River through a NPDES permit regulated by the EPA and DNREC. The treatment facility is capable of providing BOD and TSS removal as well as Nutrient Removal (N&P) and disinfection in accordance with the discharge permit. In addition to the main treatment train, the County operates a sludge processing system which includes dewatering, lime stabilization, and thermal drying utilizing gas-fired dryers.

Proposed regulatory changes may result in an increased number of facilities and even single family home systems which are required to provide higher level of treatment. Regardless of whether a system has a surface water discharge system, such as Kent County, or an onsite disposal system, as discharge permit requirements become more stringent, the cost to operate and maintain these systems increases.

In recent years, Kent County has taken multiple steps to make their facility more safe, cost effective, environmentally friendly, or in other words - more sustainable. Their vision has been brought to reality through multiple improvement projects at the facility including the following:

Replacement of Chlorine Gas Disinfection with Ultra-violet (UV) Disinfection

Eliminated the need for chlorine gas at the facility, which is potentially extremely hazardous for operators as well as nearby residents.

Eliminated dechlorination chemical requirements.

Administration Building Energy Efficiency Improvements

Replacement of existing roofing, HVAC and lighting systems in the administration building. Utilized the constant temperature of the treated effluent through a heat exchange system in of geothermal heating.

1.2-megawatt Photo-Voltaic Solar Panel System

System comprised of over 6,000 solar panels. On a sunny day, this system is capable of making the facility self-sufficient from a power standpoint.

Passive Solar Sludge Drying System

Installation of three passive solar sludge drying chambers. These chambers (similar to green houses) will be capable of processing approximately 15-20% of the total sludge production for the facility. Supplemental heating is provided by a solar heat collection and storage facility through radiant floor heating in the floor slabs to supplement the natural solar energy gained through the chamber walls and ceiling. A climate control system is designed to optimize the

performance of the system. This system will significantly reduce the use of natural gas for sludge drying and if proven successful will be expanded to a full scale installation to eliminate the need for thermal drying completely.

On June 2, 2011, Governor Jack Markell and DNREC Secretary Collin O'Mara joined EPA Mid-Atlantic Regional Administrator Shawn M. Garvin to present the EPA Performance and Innovation in the SRF Creating Environmental Success (PISCES) to Kent County for the recent improvement projects at the Kent County Regional Wastewater Treatment Facility. The PISCES award was created to acknowledge and promote program innovations that advance the EPA goals of performance and water quality protection.

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2011 Calendar of Events

July

Delaware State Fair Exhibit
July 21 thru July 30
Grandstand, Delaware State Fair
Harrington, DE

**Remember to stop by and
see us at the fair in the
Grandstand!**

August

August 17 DOWRA Membership Appreciation Crab Feast
Invite Only //6:00 pm, Seafood City, Felton
** All those who attend board/membership meetings and volunteer on committees will be invited

September

September 14, Board/Membership Meeting
6:30 pm Pizza, 7:00 pm meeting starts
Board Room, Exhibit Hall
Delaware State Fairgrounds

September 16, Annual Golf Tournament
12:00 pm, at Jonathans Landing Golf Course (Shotgun Start)
Magnolia

October

October 11-12
Annual DOWRA Conference
Location : Dover Downs Hotel and Casino

Delaware Technical Community College's On-Site Training Lab

Delaware Technical and Community College would like to thank DOWRA for their support and volunteer work in assisting with the installation of new technologies and repairing existing structures at the on-site training lab. The training lab is utilized to train on-site professionals, industry leaders, homeowners, and interested parties in the installation, operation, inspection and maintenance of on-site systems. The College is very proud to offer training to include the latest technologies in the field.

This year with DOWRA's help, the lab was able to add to the training center the following: Ecopure Peat System; White Knight Treatment Unit, Infiltrator Plastic Septic Tank; Infiltration EZFLOW geosynthetic aggregate disposal system; and American Manufacturing Distribution Box with Riser. A Bio-Coir advanced treatment unit will be installed in early fall.

For training opportunities please contact Jerry Williams at 302-856-5400, or if you would like to donate a system, please contact Hilary Valentine at 302-233-2759.

Greenovative Technologies Introduces EcoHancer Septic Treatment

Greenovative Technologies®, a JSH international™ company, has launched an innovative, non-toxic septic product called EcoHancer™. Made from naturally occurring peat, EcoHancer™ stimulates existing microbial populations within the septic system which accelerates their growth and activity. This increased activity works to improve septic tank settling, reduce sludge build-up and maximize drain field performance, while reducing suspended solids in the effluent of wastewater systems. Regular maintenance with EcoHancer™ will improve the system's performance, minimizing and possibly reversing the risk of septic system malfunctions which can result in costly repairs, contamination and detrimental environmental impacts.

EcoHancer™ is an unparalleled biotechnology breakthrough. It is unlike other septic treatments in the marketplace as it is not an enzyme or genetically engineered additive. Derived from a patented peat extraction and stabilization process, the organic formula is safe for all septic system environments. EcoHancer's core material was tested to US EPA standards for solid waste at the New Jersey Institute of Technology. Results indicate that EcoHancer™ will not cause any biological degradation and is environmentally safe for all wastewater applications. A study conducted by South Jersey Engineers, LLC of Voorhees NJ tested EcoHancer™ in residential and commercial septic systems. Overloading and solid loading challenges at each of three testing sites were eliminated over the course of the study. Drain fields which were failing prior to the study were restored or visibly improved during the test period.

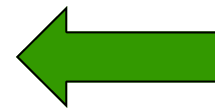
According to Sandford Mersky, P.E., President of South Jersey Engineers, "Our work on the program at all three of these locations clearly illustrates the ability of EcoHancer™ to improve the biological process and system performance in all phases of the septic system treatment."

"EcoHancer™ provides better performing septic systems, reducing the likelihood of groundwater contamination. By improving the entire ecosystem surrounding a septic system, rather than just the tank, this truly organic product will have far-reaching, positive effects in helping to reduce our impact on the environment," said JSH international Chief Executive Officer Kevin Mulvihill.

EcoHancer™ and its Grease trap counterpart TSS™ are represented in Delaware by Environmental Products and Solutions and is only available through licensed class F Waste Haulers. To download a copy of the Rowan University study on TSS please visit www.epandsweb.com



Would you like to advertise in this newsletter. DOWRA will be accepting 1/4 and 1/2 page ads. If you are interested in submitting information prior to the July newsletter, please contact Hilary at: hilaryv@epandsweb.com!



Government Award Presented to Artesian Water Recycling Partnership

Artesian Water Recycling Partnership

For encouraging and supporting the use of reclaimed municipal wastewater for agricultural irrigation and groundwater recharge. The Partnership includes Artesian Resources Corporation, the town of Middletown (DE), the office of Governor Jack Markell, the Delaware Department of Natural Resources and Environmental Control, the Delaware Department of Agriculture, the University of Delaware and the farms of Dennis Clay and Lawrence Jester.

The Artesian Water Recycling Partnership (AWRP) was initiated to encourage and support the use of reclaimed water for agricultural irrigation and other needs. Using reclaimed water to irrigate farm fields can save the Delmarva region millions of gallons of groundwater each day.

The AWRP's first project in Middletown began operation in Summer 2010 as a result of the exemplary cooperative effort of government and private partners, including Artesian, the town of Middletown, Governor Jack Markell's office, the Delaware Department of Natural Resources and Environmental Control, the Delaware Department of Agriculture, the University of Delaware and two area farmers, Dennis Clay and Lawrence Jester. The project saved 76 million gallons of water in 2010 and enabled the farmers to irrigate their fields with reclaimed water from Middletown instead of using pumped ground water. Using reclaimed water saves groundwater; reduces nutrient loading to rivers, streams and to the Delaware Bay; enables municipalities to expand wastewater service without capital expenditures for the purchase of land; reduces the carbon footprint; and makes farming more financially tenable. By any measure, the projects implemented by the Partnership are a substantial benefit to residents, farmers, taxpayers, the environment and everyone involved.

Through the AWRP initiative, Artesian provided planning, engineering and technical expertise and partnered with the town of Middletown, the State of Delaware, and local farmers to obtain project approvals for this innovative endeavor that was completed in only nine months. The leadership and cooperation of governmental agencies was essential in developing an acceptable regulatory framework to make these projects feasible.

It is expected that this will be the first of many water recycling projects that will be initiated on the Delmarva Peninsula. Through the AWRP initiative, Artesian intends to work with developers, farmers and municipalities to encourage and support the use of creative water recycling approaches such as rapid infiltration and spray irrigation for agriculture.

From Left: Brian Carbaugh, P.E. Artesian; Marlene Baust, DNREC; Secretary of DNREC, Collin O'Mara; Ken Branner, Mayor of Middletown; Dennis Clay; Lawrence Jester, and Secretary of Ag., Ed Kee.



Livin' On the Edge: Coastal Construction in High Hazard Areas– By Jim Cassidy

As far back as anybody can remember folks have wanted to live in that one spot where the water meets the land. There is just something about knowing that you are the first person on the coast to see the sunrise or that your closest neighbor to the east just happens to live somewhere in Europe. That being said, it is becoming more and more difficult to do just that.

With climate change and sea level rise becoming major global environmental issues, the guidelines for coastal construction are becoming more stringent all the time. There is no place where this has become more evident than in the small, unincorporated beachfront towns and areas that dot Delaware's coastline from Fenwick Island to Woodland Beach. These are places where on-site wastewater treatment and disposal systems are used, almost exclusively, to allow development to occur.

In the upcoming amendments of the Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems, Section 2.22 & 2.22.1 makes reference to FEMA NFIP 44 CFR 60.3 (a) (6) which states: *R"equire within flood-prone areas (i) new and replacement sanitary sewage systems to be designed to minimize or eliminate infiltration of floodwater into the system and discharges from the systems into floodwaters and (ii) onsite waste disposal systems to be located to avoid impairment to them or contamination from them during flooding ."*

In most cases this means the use of "common sense" during the site evaluation and system design process. Placing the system as far landward as possible on the property and situating tanks so they are perpendicular to any possible wave activity are things that all competent designers do without any additional regulations requiring it. These items also have a minimal impact on the cost of the overall system installation. However, in some cases, a lot more attention is needed due to specific site characteristics.

These guidelines come into effect most prevalently in areas designated as VE, V1-30 or V zones on the Flood Insurance Rate Maps (FIRMs). These areas are known as "high coastal hazard areas", they are prone to flooding and wave activity. While all of the instances where the FEMA rules have come into play in Delaware so far have been beachfront and the word "coastal" is used throughout this article, V-zones can be mapped almost anywhere tidal waterfront property exists. In these cases it is necessary to take additional precautions to minimize or eliminate the potential for damage to the wastewater system and the inherent pollution to the receiving waters that goes along with it. The items that are typically compromised in these adverse conditions are the building sewer, vent pipe and tank risers.

Building sewers can be bolstered by using a heavier material like Sch. 80 PVC pipe or even cast iron to keep it from breaking due to wave activity. The addition of a one way flapper valve inside the tank will keep effluent from escaping when the tank is surcharged with flood water. Simple vent pipes can be replaced with air release valves that are smaller and less likely to be broken by wave activity. Lastly, risers need to be secured by bolting or reinforcing them in another way to the tank. They should also have all necessary screws and/or locks in place to prevent lids from being knocked off or floating away.

Not only are these the most common items to be dealt with when it comes to infiltration into the system and discharges from the system, but they are also least expensive to address. All of the items mentioned above can be added to a system and only raise the cost of installation by a few hundred dollars.

While these items are the most common and are adequate to meet the guidelines in most cases, there are always extreme cases. Situations where entire lots are located seaward of building setback lines, where lots are subject to very frequent flooding and extensive wave action. In these situations extreme measures must be



Would you like to become a DOWRA board member? Nominations for the DOWRA 2012 Board of Directors are being accepted for : VIP; Academic; and Operator

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We are On the Web
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taken to protect the wastewater disposal system. In locations such as this a permanent holding tank is usually considered the only option for wastewater removal, but even this 20 ton concrete behemoth needs some very special and very expensive attention to meet the FEMA requirements.

First, it needs all of the items that were mentioned above. Second, it needs to have an anti-bouncy device designed to keep the tank from floating during an extreme high tide or flooding, these items deal predominantly with issues surrounding flooding. The third item that is needed in locations such as this deals with another element common to these areas referred to as **SCOUR**. Scour is the erosion of sand or soil by moving water, often as a result of water impacting foundation elements. Scour causes the exposure and possible undermining of tanks and drainfields if they exist on the site. The only way to deal with scour is prevent it by constructing something deep enough that it can't be undermined. This must be designed by an engineer that is well versed in marine engineering.

In the few instances in Delaware where this type of construction has occurred composite sheeting has been installed around all 4 sides of the tank location, to a depth greater than any possible scour can take place, in these cases ~16' below existing grade. An excavation within the composite "box" is made and the holding tank is installed within the confines of the box. It is then backfilled and the anti-bouncy pad is then poured over the tank and grading is done around the entire tank area. The additional work when it comes to protection from scour has in essence quadrupled the cost of the holding tank installations for these homeowners.

To learn more about the new requirements for constructing wastewater systems in coastal high hazard areas, contact Delaware's DNREC at (302) 856-4561 or 739-9947. You can also look for a pamphlet entitled "Damage-Resistant Practices for Designing Septic Systems in Coastal High Hazard Areas" prepared jointly by Sea Grant Delaware, NOAA and DNREC .

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