Stephanie Rochefort, Todd Gianotti, Mary Jane Meier, Steve Clifton, Gene Weeks, Kurt Robichaud & Ben Mosher. We ... for meaningful articles for the Wastewater Operator in a timely fashion. Send submission articles for THE COLLECTOR to:

Stephanie Rochefort via email at srochefort@somersworth.com

Editor - Stephanie Rochefort - Layout & Design - Todd Gianotti

"THE COLLECTOR" is the Official Newsletter of the NHWPCA

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Inside Back Cover -

Words from the Editor

The motto of this newsletter is “Share Your Thoughts”. That’s why when I started writing my continuing series of lab articles, I used the title “Thoughts from the Bench”. My latest thought is that I shouldn’t be doing all the thinking! Readers, please get in touch when you have something to share or an idea that you’d like to read about. We’d love to be able to share stories about new employees, retirees and career advancements – you just have to let us know. Don’t be scared by the idea of having to write up some Pulitzer Prize-worthy article, just get in touch and I’m ready to help you put an idea into print. E-mail is a great way to get in touch, but so is the telephone here at the plant and I even have voice-mail! My teenagers laughed when I bragged about our new voice-mail system, but what do you expect from the texting generation? LOL.

Kristen Noel, Wes Ripple, NHWPCA Permit Committee,
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Thomas Page, P.E., Gene Weeks, Steve Clifton,
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Upcoming Events

April 11, 2013 - NHWPCA Spring meeting & annual Trade Fair at the Margate Resort in Laconia, NH.
April 20, 2013 - Discover WILD NH Day at the NH Fish & Game Department at 11 Hazen Drive, Concord, NH.
June 21, 2013 - NHWPCA Summer meeting at Ellacoya State Park in Gilford, NH.
August 1, 2013 - 23rd Annual Golf Tournament at Beaver Brook Golf Course in Concord, NH.

Words from the Editor

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SEWER HISTORY

If you like the history of our industry and the progression of the technology, check out the website The History of Sanitary Sewers. This website will take you from ancient times to the present, with articles, photos and many other resources. There is a wealth of information. So check it out at www.sewerhistory.org.
2013 NHWPCA Presidential Address
By Kristen Noel - President

In the seven years that I have been a wastewater professional I have spent six of those years as a participating member of the NHWPCA. I began as a member of the Communications committee and after only a few months I was recruited by Ray Vermette who was the current President at that time. I hadn’t been in wastewater for that long but he said “We need a fresh perspective and new blood on the board”. And so I joined the board of directors and the rest is history. The numerous opportunities that I have had as a member of the association have allowed me to gain valuable knowledge on everything wastewater related. I participated in the Operator Exchange, touring several facilities, where I learned that although no two wastewater treatment facilities are alike, we all face similar challenges. It is those challenges that have shaped my goal for the year 2013 as President of the NHWPCA.

It was 40 years ago that the Clean Water Act was established enabling Professionals to come together to tackle the challenges of cleaning up our polluted water resources. In 40 years those efforts have indeed paid off as evidenced by the fact that our rivers, lakes and streams are now clean and safe. But the job is not done, we have to remain vigilant and continue our efforts so that we don’t backtrack on what has been accomplished. Unfortunately, we have done our jobs so well that most people, outside of our industry, don’t even know what we do! Many people take for granted that they can safely swim and fish in our lakes and rivers or the fact that with just the turn of a knob there is abundant clean water at their disposal. Although it seems as though we have achieved the goals of the Clean Water Act, we as Wastewater professionals are now faced with a whole new set of challenges such as aging infrastructure, more stringent permit requirements, aging workforce and a lack of funding. These are the very issues that the public and our elected officials need to be made aware of and that is why Education must be NHWPCA’s prime goal.

We need to speak out about what we do, the challenges that this industry faces and why it is so important to the quality of life here in New Hampshire. Furthermore, we need to do a better job of attracting and educating the next generation of Wastewater Professionals. Many young people don’t know that career opportunities even exist in the Wastewater industry. Most importantly, we need to educate our elected representatives, as well as New Hampshire residents, of the importance of continuing our efforts and to find responsible ways to fund this infrastructure so that future generations can continue to enjoy clean water. So that is why I am asking all members of the NHWPCA to make a concerted effort to reach out to your elected officials and invite them for a tour of your wastewater treatment facilities. Call your legislators and personally invite them to attend the Legislative Breakfast so they may learn about our critical infrastructure and the current challenges we are all facing. We need to encourage school age children and their parents to tour these facilities to expose them to what we do to keep our waterways clean and to the possibilities of a future Wastewater career.

As your President for 2013, I am challenging each and every member of the NHWPCA to reach out, in each of your communities. To educate as many people as you can about this vital infrastructure and the challenges facing this industry. Just take a few moments to call your legislators and encourage them to attend the annual Legislative breakfast and/or have an open house at your facility to encourage the public to learn about what we do. As the saying goes the squeaky wheel gets the grease, so we all need to squeak. Let us all, as Wastewater Professionals, get involved to give our profession a voice that says loudly and proudly “Water Matters”!
Getting the Most Out of Your MLE Process
By Wes Ripple, NHDES

Chances are, if your activated sludge plant was upgraded or modified within the last five to fifteen years to either meet ammonia limits or to provide some remedy to nitrification related process problems, then you may already have an anoxic zone at the head end of your aeration basin. Anoxic zones are often added because they help recover a portion of the alkalinity lost during nitrification, help improve settling through filament control and reduce unwanted denitrification in the secondary clarifier. These benefits are realized and maximized through controlled denitrification. In the anoxic zone the proper environment is established by intentionally excluding the introduction of dissolved oxygen and intentionally encouraging the introduction of nitrates. Under oxygen limiting conditions and in the presence of sufficient food (BOD), BOD reducing bacteria will utilize the oxygen molecule in nitrate (NO₃⁻) for respiration to consume the influent BOD, leaving nitrogen gas in its place. The nitrogen gas is then stripped to the atmosphere, completing the denitrification process. The zones are mechanically mixed and nitrates are supplied via the RAS line. The limitation to this process is that only a fixed amount of nitrate can be recycled back to the zone via the RAS, thus limiting the zone’s capabilities.

If a separate nitrate recycle pump is added at the end of the aeration basin and high volumes of nitrate laden mixed liquor can be recycled back to the zone, the denitrification potential is maximized and the most benefits obtained. This forms the basis for the Modified Ludzak-Ettinger, or MLE Process.

The MLE’s biggest attribute is in nitrogen removal. Nitrogen is removed from the water whenever nitrates are reduced to nitrogen gas and released to the atmosphere. The MLE process, with optimization, is capable of getting down to 5-6 mg/l of TN. When coupled with a post anoxic zone as in a 4-stage Bardenpho process or with a separate stage denite filter, the combined systems become capable of achieving the 3 mg/l limit of technology written in permits today.

If the ultimate goal is nitrogen removal, then it is important to understand how the MLE process works. The anoxic tank, situated at the head end of aeration, utilizes the influent BOD as the bacteria’s food source. Maximum nitrate removal occurs by employing high nitrate recycle rates on the order of 300-400% of the influent flow. This means that if your influent flow is 1 MGD, you will be returning 3 – 4 MGD back through the zone. This is a lot of water, and when the RAS flow is included, the bugs have less contact time to do their work.

Reaction rates are entirely dependent on three things; temperature; BOD; and tank geometry. In general, biological reactions are slower in cold water than in warm. Slower reaction rates require longer contact times. High recycle rates reduce contact times. The MLE process works because of the high internal recycle rates. However, high recycle rates during periods of lower water temperatures may actually render denitrification less effective. Temperature can be compensated for and reaction rates increased by increasing the amount of food. Higher influent BOD at anytime of year, especially during lower water temperatures, will increase reaction rates and allow for higher recycle rates. If your plant has primary clarifiers, BOD can be increased by taking some of them off line, or by bypassing a portion of the raw influent around them. Note, however, if you decide to bypass them entirely, your sludge dewatering characteristics will change.

There should be at least 4 times as much BOD to nitrate nitrogen entering the anoxic zone in order to support high recycle rates. If the BOD is low, high recycle rates will just blow nitrate through the tank. Not all BOD is created equal, and not all of the influent BOD may be readily available as food. The bugs have only a limited amount of time to consume the food, so the BOD has to be in a simple, easily obtained form. Acetic acid is an example. It is a short chained volatile fatty acid and the bugs chomp right down on it fast. Acetic acid is produced through fermentation during the first stages of septicity. Primary sludge fermenters are specially designed to allow this to happen and can supplement the influent BOD. Operating with a higher primary clarifier sludge blanket will accomplish the same thing. There has been much research on supplemental food sources and a future article will discuss some of the alternatives.

Plug flow systems promote faster reactions than completely mixed tanks. In a plug flow tank, the bugs are subjected to the highest concentration of food with an abundant amount of nitrate. The food is reduced immediately and the nitrates are used faster. Any residual D.O. in the influent is also depleted sooner, allowing for more of the tank volume to act in an anoxic mode. In a complete mix system, the food is scattered and the reactions are slower. Remember, in order to get the maximum nitrogen removal, high recycle rates are needed, and high recycle rates can only be supported by fast reaction rates. Excessive recycle rates, however, tend to shift the tank dynamics from plug flow to complete mix.

Recycle flow control is important. It is not a good idea to just set the pump speed and forget about it. The speed must be governed by the conditions within the anoxic tank. If the BOD is not sufficient, higher recycle rates may only tend to further di-

(Continued on page 3)
lute the influent flow and introduce unwanted oxygen into the tank, making the process less effective. That means more nitrate going out the effluent or to downstream post anoxic zones. Make sure the recycle system allows for easy monitoring and control.

Recycle rates can be adjusted based on anoxic zone effluent nitrate concentrations. By establishing a target of < 0.5 mg/l NO$_3^-$, the rate can be adjusted up or down to meet the target. Grab samples would suffice for monitoring but in-situ analyzers pacing the recycle pump would be ideal.

In summary, the total nitrogen in the effluent is directly related to the environmental conditions within the zone and the amount of recycle that can ultimately be pumped. For those plants with a secondary or post anoxic zone that must rely on supplemental carbon addition (more on that in a future article), maximizing denitrification in the first zone will enable the secondary zone to perform better and lower chemical costs.

The NHWPCA Newsletter Turns 30

By Todd Gianotti – Town of Newmarket WWTF

This year, and this very issue, marks the 30th anniversary of the Collector, the official newsletter for the NHWPCA. The first issue of the Collector debuted in March 1983; it consisted of six pages with articles about Governor John Sununu being the guest speaker at the Trade Fair, the Clean Water Movement, Maintenance Hot Topics and Operator’s Ideas, a Certification practice quiz, a list of NH Municipal Facilities Accepting Septage and a Safety Corner. It also included information about the Education committee, Public Relations committee and the Scholarship committee. There is a chart showing the 1982 certification exam results for grades 1 thru 5 which displayed the number of passed and failed exams, and the percentage passed.

The newsletter has gone through several format changes with different logos and looks through the years. It has also gone through a variety of editors and committee members, for which a huge thank you goes out to them. Over the years the newsletter has had numerous writers and contributors, from operators to engineers sharing their knowledge and experiences in the wastewater field and a big thank you to them as well. Without these contributors the newsletter would never have made it 30 years, so thank you very much to them as well.

Just like the first Collector, this is a newsletter for you the operator, maintenance tech., lab tech., engineers and wastewater professionals. It’s how the NHWPCA keeps you up-to-date on what’s going on in the Association and the wastewater field.

So, remember, this has been your newsletter for the past 30 years, so help keep it going and SHARE YOUR THOUGHTS.
The NPDES Permit Committee was formed in 2012 to serve the membership by monitoring ongoing permit issues in New Hampshire, to keep the membership informed on the process involved in setting permit limits and to facilitate communications among stakeholders on new permit requirements that have significant financial implications to New Hampshire municipalities. Led by Chairman, Sean Greig, the new committee hit the ground running in 2012, staging a one-day symposium on “The Impacts and Cost of Water Quality Compliance”. Over 100 people attended the event, which was held at the Derryfield Conference Center in Manchester and included presentations on a wide variety of topics.

Mr. Fred McNeill, Chief Engineer City of Manchester, graciously presided over the event, introducing the speakers and facilitating audience participation, which was spirited. Mr. Robert Varney, Normandeau Associates, and former NHDES Commissioner, was the first speaker and he provided a historical overview of Water Quality Standards, which drive discharge permit limits.

The next two speakers, Gary Cohen and John Hall of John Hall Associates, presented the national perspective of water quality and NPDES permitting issues. Mr. Cohen noted that an environmental group had recently filed a lawsuit seeking nutrient standards to be added to the “Secondary Treatment Standards” of the Clean Water Act, which, if successful, could complicate enforcement. Mr. Hall reviewed a number of examples showing how EPA permit approaches sometimes resulted in discharge limits that were more stringent than necessary to meet water quality criteria. He also emphasized the importance of crafting reasonable State Water Quality Standards as the foundation of reasonable permit limits. Mr. Hall maintained the audience’s attention with many specific examples of unnecessarily stringent permitting requirements for a wide range of parameters from nutrients and bacteria to metals.

The final speaker of the morning session was Mr. Tom Walsh, Massachusetts Coalition for Water Resource Stewardship Board Member. Mr. Walsh described the recently formed Massachusetts Coalition group and the drivers that led to its formation. Mr. Walsh is also the Director Emeritus, Upper Blackstone Water Pollution Abatement District, serving the City of Worcester, Massachusetts and surrounding member communities. New discharge permit limits imposed on the District pose major financial challenges, which prompted the District to legally challenge the EPA. Mr. Walsh touted the importance of stakeholders working together and appealing to the highest political levels with a united voice.

The afternoon session was devoted to local case studies and a roundtable panel discussion with all of the presenters. The case studies illustrated the range of new discharge permit limits faced by individual New Hampshire communities and the experiences of these communities reacting to, and coping with, these new regulatory requirements. The case studies documented the communities of Keene, Jaffrey, Manchester, and the Great Bay Municipal Coalition (Portsmouth, Dover, Exeter, Newmarket and Rochester). Donna Hanscom, DPW Asst. Director City of Keene, described the City’s efforts to mitigate new metals and phosphorus limits including site specific water quality criteria studies, NPDES appeal, and negotiation of an EPA Administrative Order. Neil Cheseldine, Wright-Pierce, recounted similar experiences in the Town of Jaffrey including cooperative efforts with the NHDES to perform river studies that were ultimately not incorporated by the EPA. In both instances, the relatively small NH communities cited the difficulties of an individual stakeholder trying to negotiate with the seemingly insurmountable resources of the EPA.

Rick Cantu, Supt. City of Manchester Environmental Protection Division, summarized the city of Manchester’s efforts in response to a new aluminum discharge limit. The city negotiated an EPA Administrative Order compliance schedule that allowed time to perform a river study in concert with an ongoing Army Corps of Engineers study of the Merrimack River. The city was able to show that effluent from the WWTF has lower levels of aluminum than upstream ambient river water. Manchester was able to show that, during critical low-flow periods which are used as the basis for WWTF discharge limits, the aluminum water quality criteria are being met.

Dean Peshel, Peshel Consulting LLC, described the efforts of the Great Bay Municipal Coalition communities to work together to negotiate reasonable and cost effective discharge limits. The Coalition is proposing innovative performance-based approaches that include long-term water quality monitoring to determine the demonstrated level of treatment standards rather than sole reliance on predictive water quality models. This approach, also referred to as “Adaptive Management”, was formalized with the negotiation of a Memorandum of Understanding (MOU) with the State of New Hampshire.

The day concluded with a roundtable panel discussion, allowing the audience to ask questions of all the presenters.

The response to the Symposium was very positive. Judging by the turn-out, the issue of more stringent discharge permit limits is on the minds of many communities. This Symposium was a good first step towards facilitating communications amongst the NHWPCA membership, and disseminating information on the experiences of communities at the forefront of this new
A Near Miss
Written by Rick Cantu, Chair - NHWPCA Safety Committee

Those of you who have enjoyed Safety Corner articles over the years will notice that this article has a different author. Unfortunately, with this article, we say goodbye to former author, Chris Hipkiss, who has retired from the role. We thank Chris for his many years of service to the Safety and Newsletter committees, and for his tireless efforts to write regular safety articles and hunt down near misses to warn us all about. Thank you Chris and best wishes on your retirement!

The NHWPCA Safety Committee will endeavor to keep up Chris’ legacy of collecting and writing Near Miss and other safety articles, but we can’t do it without you. Please continue to submit your near misses by emailing them to the Safety Committee Chair as listed on the NHWPCA website (currently Rick Cantu: rcan@manchesternh.gov). Please note: All near miss reports are confidential, and no names or facilities will be published.

A Near Miss … Be Aware of Your Surroundings

The sunny warmth of spring makes a plant walk-through more pleasurable. A fellow worker and I had finished up inspection of the chlorine contact chambers and were beginning our stroll back to the office.

“Is there someone out there?” Not a soul was in sight, but we both heard the words very distinctly. We looked around and out of a manhole riser pops a head. “I thought I heard someone.”

The contractor was building an invert in the manhole before bringing the structure out to the pump station site for installation. I took two steps up the ladder to look at the quality of the work being done and began to converse with the man.

After five minutes of conversation, I got off the ladder and backed up – one step. I immediately stepped into something, tripped backwards, the other foot fell into something, and I struggled to maintain my balance. I floundered around for what seemed an eternity, but finally stayed steady on my feet. My fellow worker howled at my mishap.

The one step backwards landed my left foot in the cement pan the contractor had been using to mix mortar, the loss of balance swung me around to where my next step landed squarely into a pail of water that was being used for mortar, spilling the bucket and slightly twisting me awkwardly. There was plenty of spare piping, rebar, and construction debris around that, if I had fallen, could have caused serious injury. I was fortunate this time.

Since I had walked by this location hundreds of times, I subconsciously assumed that I could do it again. But, I didn’t consider the obstacles that now created a mine field for a non-observant passer-by. I had nonchalantly climbed the ladder without even spotting the mortar pan and pail of water only a few feet from the ladder. My familiarity from all my previous walks prevented me from registering these new hazards. When I really looked after the event, I was amazed at what I had failed to notice before my two-step climb up the ladder.

It was a wake-up call that I need to always be aware of my surroundings.
pH is one of the simplest and easiest tests that we do in the Somersworth WWTF lab. Every day somebody turns on the meter, calibrates it, runs a standard and analyzes an effluent grab sample. Well, one day recently, I looked down at the meter and it said that my sample temperature was 135 degrees C. I’ll admit that the first thing I did was stick a finger into the sample to see if it was hot (duh, it was cold) so there was obviously something wrong with my pH meter.

The first thing that I did to trouble-shoot was un-plug the temperature-compensating probe and then plug it back in. That worked. It also worked the next day. The day after that I had to un-plug and re-plug multiple times before the problem went away. By the following Tuesday, I found that I needed to un-plug and re-plug eight times then turn the meter so that it was at a 45 degree angle to the bench and then un-plug and re-plug seven more times and then it worked fine. Maybe it was time to kick the trouble-shooting up a notch – you think?

I had a brand-new probe on the shelf for just such a situation, so I decided that I would try that out Wednesday afternoon and then I would know whether the meter or the probe was the problem. On Wednesday morning, I began to go through my un-plug/re-plug routine, but I only got to the third try when the end of the plug came right off! First, I did a little victory dance because I knew what the problem was. Then, I handed the pieces off to the plant mechanic to “play with” and got ready to put the new probe in-service. Before I even got the box opened, he was back with the repaired probe and it’s been fine ever since.

Because I had obviously been taking the pH test for granted, I figured that it was time to go back to the basics (Standard Methods) and see if I was missing anything. The very first sentence of method 4500-H+ (2000) states that “Measurement of pH is one of the most important and frequently used tests in water chemistry.” That just confirmed for me that I should be taking a close look at the method. Standard Methods acknowledges that pH meters and probes are all different and so you should follow manufacturer’s directions for calibrating. You do need to make sure to use a meter, a glass electrode, a reference electrode and a temperature-compensating device. Nowadays, it is common to use a combination electrode that incorporates the glass and reference electrodes into a single probe. If you’re using a refillable electrode, you must make sure that the correct filling solution is used to the proper level.

Even though there’s instructions for making your own buffers, reading on I see that commercially available buffers are OK to use. (Thank goodness!) I also see that I’m using three buffers to calibrate with like I’m supposed to. I’m using a steady rate to stir the buffers and samples and I’m rinsing the electrodes and blotting between samples and always recording the temperature result along with the pH result. Standard Methods states that an accuracy of +/- 0.05 pH units can be achieved. Well, that’s just what I have programmed into my QAQC spreadsheet. And, even though my pH meter will spit out more digits, I report to the nearest 0.1 pH unit, which is in the method also.

This was one of my better excursions into Standard Methods as I confirmed that I was doing everything OK. The moral of my story is that it is important to review Standard Methods on a regular basis. Sometimes you finish by feeling good that you’re doing everything right. Other times you finish with some work to do – maybe I’ll write about that next time.
2012 NHWPCA Winter Meeting Photos
Photos By Charlie Tyler - Deer Island
Utility Capital Planning with GIS

By: Bryson Koziell, GISP, Project Manager, CDM Smith, Manchester, NH

The development of a long-term capital plan for a wastewater utility is a difficult task. Historically, utilities have had to play a guessing game when it came to predicting their long-term capital expenditures. As a result, capital budgets have been produced that are not accurate past a few years and are therefore not defensible when used to justify rate and budget increases. To help provide better information, and defensible numbers that can be used to justify rate and budget increases, utilities are now increasingly turning to their GIS for more accurate capital planning efforts.

Now available through ESRI’s ArcGIS for Local Government website is a set of free tools that work within the ArcGIS Desktop environment that allow utilities to produce reports from their GIS that can be accessed directly by capital improvement plans. With minimal configuration, utilities can begin to rate and score their assets based on GIS attributes (diameter, material, installation year) on a broad basis, or individually rate and score assets based on known and environmental factors. Once developed, this rating system supports a series of one click reporting tools that will produce reports, such as pipe life expectancy, that will support capital improvements through both graphical and tabular outputs. When it’s time to zero in on the low scoring infrastructure and to estimate costs for replacement and rehabilitation, a cost estimating add-in can be utilized. This add-in accesses a configurable table that holds linear foot costs for replacement and rehabilitation while taking into account different construction methods. Users can either click on an existing pipe within the GIS environment to estimate replacement or rehabilitation, or use a sketch tool to draw in and cost proposed pipes. When it comes time to determine a replacement order for pipes the decision support tool takes into account sewer back-ups and overflow information that is stored separately in related and linked tables. With the help of these reporting and cost estimating tools, utilities can now produce more accurate capital budgets that are defensible with fact-based information from GIS.

While these tools are not designed to replace a comprehensive asset management program, utilities will find that the free capital planning and infrastructure management tools can complement their existing GIS and asset management programs by providing decision-making tools and generating information that can be used directly by capital improvement programs.
SUPPORT THE NEWSLETTER!

There are two ways that the members and vendors can support the Newsletter:

**Annual Sponsorship** - At the beginning of the year, the Newsletter Committee solicits interest from vendors in supporting the newsletter by providing a $100 Sponsorship. The vendor receives recognition on the inside back cover of each newsletter for the calendar year. Your company’s logo, a contact person and phone number are included in each newsletter.

**Advertise in the Trade Fair Edition of the Newsletter** - Our Association’s main event is to come together each spring for the Trade Fair. This event provides our vendors a showcase for advertising their products. The Spring Newsletter Edition includes a special section for your company to advertise prior to the event. All our members get the newsletter prior to the Trade Fair. Business card, quarter page and half page advertisements are supported in the newsletter for a modest fee.

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Flow Assessment

PAUL R. CASEY
MANAGING PARTNER

PHONE: 603-656-9799
FAX: 603-656-0330

84 DANIEL PLUMMER ROAD
GOFFSTOWN, NH 03045
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2012 NEWEA, WEF & EPA Award Recipients

**NEWEA AWARDS**

**NEWEA Operator Award**
Jason Beckwith  
Jaffery, NH

**Alfred E. Peloquin Award**
Frederick McNeill  
Manchester, NH

**Clair N. Sawyer Award**
Larry Knight  
Hudson, NH

**WEF AWARDS & Recognitions**

**WEF Life Membership**
John Esler  
Enfield, NH

**Operations Challenge Division 1 Process Control 1st Place**

NH Seacoast Sewer Snakes

**US EPA - Region 1 Awards**

**Regional WWTP O&M Excellence Award**
Gorham, NH WWTF

**Regional WWTF Operator Award**
Daniel Peterson  
Durham, NH WWTF

**Regional Pretreatment Excellence Award**
Dover, NH
Drip Dispersal Technology

By Mitch Locker, NHDES

Photos By Thomas Page, P.E., Underwood Engineers

As the concern for sensitive environmental areas increases and pressures on water resources grows, it becomes evident that the expansion of centralized treatment facilities (or the construction of new facilities) discharging to surface waters will involve prohibitively expensive and labor intensive means to meet the changing requirements imposed by state and federal agencies.

For developments and densely populated areas inaccessible to established centralized systems, a “decentralized” treatment and disposal scenario can offer an economically and environmentally sound option to support sewer system expansion while maintaining protection of human health and the environment.

Drip Dispersal is a decentralized method that is used to distribute and dispose of treated wastewater. Unlike agricultural irrigation, drip dispersal is designed to maximize infiltration of water into the soil throughout the year. Dispersed water will evaporate and be transpired by vegetation during the growing season, but most water discharged infiltrates into the soil. This naturally filtered water ultimately recharges the underlying groundwater. This method is applicable year round and has been used in the U.S. since the late 1980’s. Currently, it is in use in NH and throughout New England both in residential and in large volume (Flow>10,000gpd) commercial applications.

Drip dispersal networks use uniformly spaced drip emitters that are attached within flexible tubing to control the rate of wastewater discharge. Typically, the drip lines are installed directly into the soil without additional media. Pumps are used to fill and pressurize the drip lines sufficiently to achieve uniform distribution. Controls are centralized and used to coordinate pump operations, run times, pressure controls and backwashing cycles. The systems are capable of remote and/or manual operations.

At flows above a single family residence, the system requires a pre-treated wastewater, usually secondary quality (e.g., BOD\text{5}<30mg / TSS<30mg/l). After settling, the wastewater is pumped thru filters assuring solids do not enter the drip system. The water is pumped and pressurized in the tubing and at the designated pressure the emitters open and the system doses the predetermined volume. The system also incorporates drain-back and intermittent back flushing to keep lines and emitters clear.

Year round use of drip dispersal systems in New England is becoming more common. In New Hampshire, drip dispersal has been used predominantly in the residential market. However, this technology has been successfully applied since 2010 in Greenfield, NH for daily flows up to 20,000 gallons per day. With the ability to modify these systems to fit available sites, facilities can consider this method as an option to redirect flows from centralized systems, reduce or seasonally eliminate surface water discharges, or apply wastewater to previously impractical areas (such as steep topography or wooded sites) where a conventional system’s cost or extensive site alteration is prohibitive.

While there are mechanical and technical considerations in applying this technology, the benefits of scalability, lower profile, year round use and adaptability in unconventional areas can make this a cost effective and environmentally sound method of wastewater disposal.
ANSWER TO DECEMBER’S CAN YOU GUESS WHO THESE PEOPLE ARE?

First row left to right: Hoffman (Dover); Wood (Plymouth); Burrelle (Claremont); Clark (Portsmouth); Mansur (Nashua); Houle (Nashua); Page (Hooksett); Allen (Littleton); Grasse (Milford). Second Row left to right: Hood (Center Harbor); Bedard (Laconia); Davis ( ); Easter (Claremont); Richard (Dover); Bruce (Keene); Roberts (Bristol); Eldridge (Rollinsford); Char (Hanover); Donnelly (Merrimack); Falls (Salem); McCloud (Bradford); Chamberlin (Hanover); Curran (Portsmouth); Grossman (Concord).

NHDES Spring Training Classes & Exams are now Posted

The Spring 2013 wastewater operator training program of classes is now posted to the NH DES web site. Please copy and paste this link into your browser to find the Application for Certification Exam, the License Renewal form and the June 12, 2013 exam announcement:


The Spring 2013 Training Announcement and Course Descriptions and Course Enrollment Forms can be found at :


****NEW**** Our training program has some new features that began in Fall 2012. DES applied the Training/Operator Outreach Funds from an EPA grant to fund a Training services contract with NEWWTA that will be in place through both of the 2013 training sessions. NEWWTA Course Registration Fees are WAIVED for NH Wastewater & Collection System Operators. FREE is Gooooood.

Take your time reading through the materials to understand what is new on course enrollment procedures and note that some courses do require payment- please pay attention!

Please note the courses offered by NEWWTA, GSRWA, and NEIWPCC require separate registration. Not all the forms are on the DES web site. You can access forms at the web links given in the Course Description listing.

For all other classes, submit your course enrollment forms via fax or US Mail only to DES.

I look forward to seeing you all soon! Announcements for additional training opportunities will be sent separately.

We all appreciate your continued cooperation by receiving e-mail notifications that help to cut down on the mailing costs!

GO GREEN!
Submersible Pump Station Maintenance Data


There are a variety of pump station configurations, and there have been books written about pump station maintenance. To narrow the field for the purposes of this brief article let’s assume that we are talking about a duplex submersible pump station. The pump station contains solids handling type pumps pumping through 4” or 6” ductile iron pipe with a separate valve chamber. This is a busy pump station with across the line starters, not VFDs.

In developing a maintenance program for our pump station one question to ask is: What data do I have about the operation of this pump station, and what data can I obtain? Keeping good records of the pump station data and looking for changes in data is a good way to keep on top of pump station maintenance and to anticipate potential problems. If we have a good SCADA system, at least some of this data may be compiled for us electronically. If we don’t, someone will have to physically obtain the data. Obviously we need alarm data. When did each alarm go off? What caused the alarm? What was done to eliminate the alarm condition? What needs to be done to prevent the alarm condition from occurring again?

As part of normal non-alarm data gathering we need the voltage and amperage for each leg of the power for both pumps when the pump is running. This data should be compiled for each trip to the pump station. Particularly we are looking for increases in running amperage over time. This can indicate a variety of potential problems including pump plugging and bearing wear. If our SCADA system does not send us pump running amperage, this may be an easy and inexpensive addition – we should consider it. Hopefully we have data on the running hours for each pump. We are looking for differences in running hours. If there is a significant difference in running hours, typically the pump that runs the most hours is pumping the least flow – and we need to find out why. Speaking of flow, can we get the discharge pressure and flow for each pump? Pressure data is relatively easy to obtain in some pump stations. A good wastewater pressure gauge is sufficient if someone is going to the pump station. If the SCADA system is going to transmit pressure data, we will need a pressure transducer tied into our station PLC. Flow meters are relatively expensive, but in some cases they can be retrofitted into the valve chamber. Good pressure and flow data will tell us if the pump is running on or close to the original curve. If it is not, there is a problem. Some possible problems are partially plugged pumps or discharge piping; or pump impeller/wear ring damage. Reduced flow can also cause, or contribute to, pump plugging. We all know that we have to keep the velocity in the discharge pipe at least 2 ft/sec. Low velocity through a pump will cause rags to hang up in the volute and plug the pump. Most submersible pumps have double shaft seals with a seal leak detection probe between them. Unfortunately, in many installations, when a seal leak is detected all it does is light an indicator light. If we are inspecting the station, these seal leak indicating lights should be on our inspection check list. If we have a SCADA system they should be tied in to the system. If a seal leak light is on, the pump should be pulled and the lower seal changed.

When someone goes to inspect the pump station, they should do so with their eyes open, and with all of their senses on alert. What do we see, hear and feel? Visual inspection data should be part of our data record. Is there a grease mat? Are the float switches free to swing properly? Are the pumps running smoothly, without vibration? Are there any unusual odors? Are all the lights and switches working properly? Is there any unwanted debris in the station? What can we observe with our eyes, ears and nose that may be indicative of a problem?

Good pump station data records are the foundation of a good pump station maintenance program. We want to anticipate problems whenever possible and deal with them before the crisis not after the crisis. Future articles will address some of the problems our data may reveal and what we can do about them.
Dave Polcari  
(603) 222-8353

Heidi Marshall, P.E.  
(603) 668-8223

Cindy Juneau  
(603) 228-0525

Rod Dubois  
(603) 224-9545

Paul R. Casey  
(603) 656-9799

Deborah Mahoney  
(617) 574-4747

Michael Trainque, P.E.  
(603) 669-5555

David Michelsen, P.E.  
(603) 227-2127

Gary Dudman  
(603) 536-8908

Marc Roper  
(508) 384-0622

Teresa Meehan  
(315) 433-2782

Steve Clifton, P.E.  
(603) 436-0192

Peter Goodwin, P.E.  
(800) 426-4262

Peter Atherton, P.E.  
(603) 430-3728

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