THE COLLECTOR

SHARE YOUR THOUGHTS  April 2008

NEW HAMPSHIRE WATER POLLUTION CONTROL ASSOCIATION
PRESIDENT’S MESSAGE  by Ed Rushbrook

The mission of our Association is to serve as a source of information on wastewater treatment and wastewater-related topics, promote good public relations and sound legislation, assist in the professional advancement of our members, and generally promote the protection and quality of the state’s waters. We have met that mission in a number of ways.

The Association holds a Clean Water Week Poster Contest for elementary school children in New Hampshire every year. Winning posters are printed onto a calendar distributed to New Hampshire schools and winning students are presented their awards in a ceremony in which Governor Lynch signs a Clean Water Week proclamation.

Last year, during National Clean Water Week, our efforts were featured on television on WMUR’s Chronicle Program. That airing included a “tour” through the Franklin (NH) Regional Wastewater Treatment Facility and emphasized how wastewater professionals work to maintain the quality of Lake Winnipesaukee as a valuable resource to residents and visitors.

The Association also sponsored a Legislative Breakfast for the first time in 2007. The goal of that effort was to provide information to legislators so they could make knowledgeable decisions on pending legislation related to environmental issues, and promote public awareness of our efforts.

To help our members stay up to date with wastewater related issues, the e-News (newsletter) was developed, and has become a valuable resource to provide our keep up to date with Association activities. Members can also stay in touch with the Association’s activities through the website at www.NHWPCA.org. The website contains useful information on upcoming activities, job opportunities, training course availability, and upcoming meeting dates.

2007 was a major milestone for the Association, marking the 40th anniversary. To celebrate this achievement, the Association sponsored a train ride in Lincoln and a boat ride to the Isle of Shoals, with commemorative items and clothing made available to members.

Continued on page 2

Old WWTP operators never die, they just

LEWOLY  O---O
HTAYC    -O-O
KLEBATN  --O--
HEWAL    O-O--
TEWES    O-O-O

The NHWPCA Operators Challenge Team—Sewer Snakes—L-R: Sean Greig, Paul Fritz, Mike Carle, Coach Paula Anania, and Ed Rushbrook—This Year’s President of the NHWPCA.
On January 29, 2008, the New Hampshire Water Pollution Control Association received the NEWEA Founders Award at the awards luncheon of the annual conference of the New England Water Environment Association in Boston. The award was given in recognition of the 40 years we have been providing environmental excellence in protecting the water environment of New Hampshire. The Association is proud to have received the Founders Award and is proud of the results of its efforts to maintain the quality of the water resources of New Hampshire.

At a time when water quality issues are being given a high level of attention, the contributions of the New Hampshire Water Pollution Control Association’s wastewater professionals stand out as an example for others in protecting our valuable water resources.

I feel privileged to have the opportunity to be President of an association that actively contributes so much to protecting our water resources. As President, my goal for 2008 is to continue to increase the public and regulatory agency awareness of our efforts so that their positive impacts are clearly recognized and continue to improve ways we can provide our members with information that benefits them professionally.

**Safety Corner**

Lessons that can be learned from **A NEAR MISS**

By Chris Hipkiss

If you have been in this business long enough there most likely was at least one incident that from a safety standpoint was a near mess. These situations are normally not reported and the only value is that the operator hopefully will not make the same error again. The purpose of this article is to share with you a NEAR MISS with the hope that by passing this information along it will some day prevent an accident report.

The Situation:

A Wastewater Treatment Plant was undergoing a major up grade part of which was the installation of a large underground concrete tank. The excavation for the tank was 36 feet deep and required large shields to be driven into the ground as the excavation proceeded. After the installation of the tank and the partial back filling of the excavation the contractor intended to pull the shields up as the back filling proceeded.

What happened that could have almost certainly resulted in serious injury?

Workers attached a heavy chain bridle from the hook on the excavators bucket to the steel shield and the excavator operator than applied an up ward force. The shield did not budge so the operator lowered to bucket and brought it up quickly in a snapping motion on the chain bridle. The shield did move slightly so the operator continued the snapping procedure when without any warning one of the chains broke and swung wildly through the air brushing the hard hat off the head of a worker standing near the shield. This was truly a NEAR MISS for if the chain had hit the worker squarely on the side of the head serious inju-

ries would have resulted.

The chain bridle was replaced with a wire rope bridle that failed and finally a wire rope bridle of sufficient size was obtained to complete the job of removing the shields.

Lessons learned

Chains are not meant to be snapped and as demonstrated by this near miss can become deadly missiles if they break at a job site. The bottom line is, use all equipment as it was designed to be used.

Do you have a near miss story to share? All story material is anonymous and you can reach me at (603)-934-2809 or e-mail me at chipkiss@des.state.nh.us.
Matters of Perspective (Part 1 - pH)

By Tim Loftus

For those of us who work in technical fields, such as in the applied sciences or in engineering, we often find ourselves surrounded by numbers. Over the course of months or years we grow comfortable comparing results to standards or evaluating whether these numbers fall within certain ranges, but during this time we can often lose sight of the significance of these numbers. How much, really, is a microgram? How fast is the speed of light in practical terms? Sometimes it is best to look at the scale of measurement in terms that are easier to visualize. For this article I will focus on pH.

The concentration of the hydrogen ion in a water solution is basically measured in powers of ten and its value is represented as a pH number. The pH scale ranges from 0 to 14, although the practical use of the scale is from 2 to 12. A pH of 7 is considered neutral. However, this does not mean that hydrogen ions are not present — they are — but in a very tiny amount. At a pH of 7, the hydrogen ions (which carry a positive charge) equal the amount of hydroxide ions (which carry a negative charge). As the pH value decreases below 7, the characteristics of the solution become governed by the acid component (hydrogen ion, H+). Conversely, as the pH increases above 7, even though hydrogen ions are present in miniscule amounts, it’s the base component (hydroxide ion, OH-) that governs the solution’s characteristics.

For every whole number pH decrease on the pH scale, there is a ten-fold increase in the active acid component of the solution. As mentioned before, a “neutral” pH of 7 still has a tiny acid component. At a pH of 6, the acid component concentration is ten times more than at 7. A pH of 5 has 100 times the concentration of hydrogen ions than a solution at pH 7. pH 4 is 1000 times, and a pH of 3 has 10,000 times the hydrogen ion concentration.

In this imperfect example of measuring pH in terms of distance, where you are right now is considered pH 7, neutral. A pH 6 would be ten yards away. A pH 5 would be the length of a football field away. About 0.6 miles away you’d find a pH of 4. Travel 5.7 miles and you will find the pH 3 marker. To reach a pH of 2, you would need to travel 57 miles from your “neutral” position of pH 7. By putting the pH scale in terms of distance, it is easy to visualize how acidic a solution can be.

Unpolluted precipitation has a pH of 5.65 (carbon dioxide dissolves in the water and creates a tiny amount of carbonic acid which gives a pH of 5.65). Any precipitation that has a pH lower than this is classified as acid rain. Using the distance analogy, the active acid component in normal rainwater would cover a distance of a little more than ten yards. We test the rainwater at my facility and several times it was found to have a pH of 3. That’s about six miles of an active acid component that shouldn’t be longer than 10+ yards. No wonder why statues and gravestones, especially marble ones, are slowly dissolving with each rainstorm. It also helps to understand why the neutralizing capacity of the land and surface water is often overtaxed, leaving many localized ecosystems sterile, especially in northeastern US and Canada.

The next article will cover units of weight typically used in the environmental field: milligrams and micrograms.

By the way, the speed of light is 186,000 miles per second. That is equivalent to 30 round trips from Boston to San Francisco in one second.

If you have any questions, suggestions, or comments, contact NEWEA Lab Practices Committee Chair Tim Loftus at (508) 949-3865 timloftus@msn.com. For more information on the NEWEA Laboratory Practices Committee, please contact Tim Loftus or Elizabeth Cutone, NEWEA Executive Director, 100 Tower Office Park, Woburn, MA 01801, (781) 939-0908, escutone@newea.org.

All past articles are posted on our website. Go to www.NEWEA.org and follow the link to the Committee Pages then to the Laboratory Practices page.

Answers to skills builder questions. from page 7

1c, 2d, 3b, 4d, 5c, 6b, 7d, 8d,
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Skills Builder Questions from the WEF web-site:

1. A total of 4000 gpd of sludge is pumped to a digester. If the sludge has a 6% total solids content and a volatile solids content of 75%, how many lbs/day volatile solids are pumped to the digester?
   a. 1125 lb/day  b. 990 lb/day  c. 1500 lb/day  d. 705 lb/day

2. An oxidation ditch is most similar to a(n) ______________ process.
   a. step-feed  b. plug flow  c. complete mix  d. extended aeration.

3. Ferric is typically supplied to wastewater treatment facilities as a ____________.
   a. gas  b. liquid  c. powder  d. granules

4. The pretreatment of wastewater typically takes place ____________.
   a. during primary clarification  b. with screens and grit removal  c. in the collection system
   d. before a wastewater enters the collection system.

5. Which of the following methods of wastewater treatment can be best adapted for crop production?
   a. rapid infiltration land treatment  b. injection  c. slow rate land treatment
   d. subsurface wastewater infiltration

6. Chemical methods for removing nitrogen involve all of the following EXCEPT ____________.
   a. breakpoint chlorination  b. ferric chloride coagulation  c. ammonia stripping  d. ion exchange

7. Which of the following parameters is typically NOT found on an NPDES permit?
   a. fecal coliform  b. TSS  c. BOD  d. VSS

8. In biological nitrogen removal, the final form of nitrogen as it leaves the process is ____________.
   a. nitrate  b. nitrite  c. ammonia  d. nitrogen gas

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