State of Uncertainty
Conflict and Controversy over How Best to Deal with Aluminum

BY DAN PECKHAM, NEIWPCC

Virtually everyone, from regulators to everyday Americans, appreciates the need to set accurate limits on the concentration of pollutants allowed in our waters. But meeting that need is seldom simple. The process for developing water quality criteria involves careful analysis and requires substantial statistical and scientific expertise. For some toxic chemicals, the process of setting a limit that will keep humans and ecosystems healthy is comparatively straightforward. However, there are “problem children” that complicate the process by refusing to behave as normally as one would expect. Bioaccumulative toxins, for example, refuse to go away once they are absorbed into the food chain. Standards, therefore, must account for accumulation in body tissue over the course of an organism’s lifetime. And then there’s aluminum.

In aluminum’s case, the answer to the question “How much is too much?” is as cloudy as a turbid stream. This metal continues to perplex scientists and regulators alike. While some studies show significant toxicity to fish under certain conditions, even at much higher aluminum concentrations. The one thing that can be agreed on, however, is that we don’t yet completely understand how aluminum reacts in water and how fish respond to it in different environments.

The stakes for solving this puzzle correctly are high. According to EPA, 6,610 miles of rivers and streams in the United States are impaired because of excess levels of aluminum. Meanwhile, effluent emitters are hesitant, to say the least, to make multimillion-dollar treatment upgrades before there is clear proof that any aluminum they discharge is actually harming anything. “To me, it says that we really should look at this a lot more closely,” says NEIWPCC Commissioner Paul Hogan, a senior consultant at Woodard & Curran who for many years oversaw the Surface Water Discharge Permit Program at the Massachusetts Department of Environmental Protection. “There are a lot of questions, and there is a lot of ‘environmental money’ involved.” The long list of competing policy, regulatory, and economic considerations at both the state and federal level leads to one conclusion beyond debate: We have ourselves quite a conundrum with aluminum.

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Case of Obstruction
Taking Action to Stem Sewer Clogs Caused by Improper Disposal

BY GREG MCNEAL AND STEPHEN HOCHBRUNN, NEIWPCC

The wastewater industry is facing a problem that, at NEIWPCC, has struck close to home. Less than a mile from NEIWPCC headquarters in Lowell, Massachusetts, are the Appleton Mills apartments—a complex of beautifully restored buildings that used to house a textile mill. Not long after the apartments opened in 2011, the sewage pump station servicing the complex began having problems with clogs. The cause was discovered soon enough. The complex’s large loft-style apartments appeal to artists, who in their work use a lot of wipes and paper towels that aren’t designed to be flushed down toilets or put down drains. But at Appleton Mills, that’s where they were going. It wasn’t a malicious act, but the consequences were serious: clearing the ensuing clogs was labor-intensive and costly.

Lowell’s wastewater utility appealed to the Appleton Mills’ developer to place signs at the complex urging residents to put wipes in the trash and not in sinks and toilets. The developer did so, but to little effect. “It didn’t help much,” says Mark Young, the utility’s executive director. “We still had the problem. So, we talked to the developer about instead trying to educate the residents about the reasons for the...
Sizing Up the Plastic Peril and the Newest Threat

It seems life without plastic is impossible. The United Nations Environmental Programme reports global annual plastic consumption has gone from 5.5 million tons in the 1980s to a level that now exceeds 120 million tons. In the United States alone, we generated 32 million tons of plastic waste in 2012. Plastics in the form of containers and packaging made up the largest share—14 million tons—with plastics in durable goods such as appliances accounting for 11 million tons. The remainder, a sizable 7 million tons, came from non-durables such as plastic plates and cups.

If you’re thinking those numbers aren’t as disturbing as they sound because a lot of the material is recycled, think again. While the recycling rate varies greatly among the different types of plastics, the overall plastics recycling rate in the United States stands at a paltry 9 percent. And of the remaining 91 percent, which amounts to 29 million tons, 10 to 15 percent enters our fresh and marine water bodies every year.

Now, a relatively new contributor of plastics in our water environment has emerged: microbeads. These tiny pieces of plastic are used as exfoliating agents in common everyday consumer products, especially personal care products such as shampoos, cosmetics, toothpaste, and facial washes. Microbeads are exceedingly small particles, ranging in size from 0.01 to 1 millimeter. Our wastewater treatment plants find them far too small to be filtered out, and, as a result, they end up in lakes and oceans and smaller water bodies of all sizes and scope.

Research conducted in the Great Lakes in 2012 found as many as 1.7 million plastic particles per square mile in the lakes, with the highest concentration in Lake Erie. And in contrast to oceans, where most plastic debris measures between one and five millimeters in diameter, about 85 percent of the plastics found in the Great Lakes measured less than one millimeter. Under an electron microscope, they looked like, in the words of one researcher, “perfectly spherical plastic balls.” In other words, they’re microbeads, and they pose a serious threat to the environment, especially to aquatic life and birds that may mistakenly perceive the miniature particles as food. Being at the top of the food chain, we as humans face potential exposure as well.

A number of states are taking action. Legislation banning products with microbeads is being considered due to the gubernatorial appointment process. NEIWPCC’s staff, under the direction of Executive Director Ronald Poltak and Deputy Director Susan Sullivan, develops and carries out programs endorsed by our Commissioners.

From the Executive Director

Sizing Up the Plastic Peril and the Newest Threat

IWR

Executive Director
Ronald Poltak

Deputy Director
Susan Sullivan

Established by an Act of Congress in 1947, the New England Interstate Water Pollution Control Commission is a non-profit interstate agency that employs a variety of strategies to meet the water-related needs of our member states—Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. NEIWPCC coordinates forums and events that encourage cooperation among the states, develops resources that foster progress on water and wastewater issues, represents the region in matters of federal policy, trains environmental professionals, initiates and oversees scientific research, educates the public, and provides overall leadership in water management and protection. NEIWPCC is overseen by 35 Commissioners—five from each member state—who are appointed by their state governors. Each state’s delegation includes the commissioners of its environmental and health agencies (or their designated representatives), with the rest of the delegation consisting of individuals appointed to the Commission by virtue of their experience and interest in water and wastewater issues. An up-to-date list of NEIWPCC’s Commissioners is available at www.neiwpcc.org/commissioners.asp; please note that the number of NEIWPCC Commissioners from each state can vary from year to year due to the gubernatorial appointment process. NEIWPCC’s staff, under the direction of Executive Director Ronald Poltak and Deputy Director Susan Sullivan, develops and carries out programs endorsed by our Commissioners.

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Balancing Act

NEIWPCC Staffer Juggles Many Efforts, Respects Divergent Views at N.Y.’s Onondaga Lake

By Anna D. Meyer, NEIWPCC

On one of the first warm days in May, Aimee Clinkhammer walked along a new paved trail overlooking Onondaga Lake in Central New York. Since joining NEIWPCC last year as an environmental analyst, Clinkhammer has served as the Onondaga Lake watershed coordinator, and she knows the area, and trail, well. She smiled as she observed other people also enjoying the trail’s picturesque path—walking, in-line skating, bicycling. At a clearing in the trees she pointed out landmarks of Syracuse at the far end of the lake. The trail, Clinkhammer said, was built on top of former wastebeds left over from Syracuse’s industrial heyday.

Starting in the 1880s, byproducts of commercial salt manufacturing were the first major pollutants discharged into Onondaga Lake. By the early twentieth century, Syracuse was a hub of manufacturing. Companies making every kind of product—from candles to air conditioners—were drawn to the area by the ease with which they could ship goods east and west via the Erie Canal and by rail. Factory waste, including mercury, lead, cobalt, and synthetic chemicals such as PCBs, entered the lake directly through discharge pipes and indirectly by way of polluted tributaries and groundwater and by runoff from contaminated soil. The 1994 designation of the lake and some tributaries and surrounding locations as Superfund sites was a lifeline for the lake. The New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency now oversee Superfund cleanup activities at 12 locations in the Onondaga Lake watershed.

Some of this activity could be seen from the trail. Clinkhammer, whose position is funded by EPA, pointed out a dredging and capping operation on the lake being done by Honeywell International, which is carrying out many Superfund cleanup projects in the watershed at sites that were polluted by companies Honeywell acquired or merged with over the years. The projects include dredging contaminated waste and capping those sites and less contaminated areas at the bottom of the lake. “The buoys that you can see around the barge,” Clinkhammer said, “hold up a silk curtain that hangs down in the water to contain destabilized sediments and suspended solids.”

In the view of many, the cleanup work underway in and around Onondaga Lake is progress that warrants praise. But as Clinkhammer has learned, the issues surrounding the lake are endlessly complicated. Her job involves working with multiple stakeholders, including one group that cares especially deeply about the lake. The people of the Onondaga Nation see themselves as stewards of Onondaga Lake for future generations, and the lake falls squarely in their aboriginal territory, which once covered some 4,000 square miles—from Lake Ontario into what is now Pennsylvania. The continued on page 10
Influential Factors

How did EPA arrive at these aluminum recommendations? To begin, note that the criteria apply only to aquatic life. Both EPA and the World Health Organization have opted not to propose human health criteria recommendations for aluminum, with WHO citing a lack of conclusive evidence. For every study showing that aluminum poses a significant threat to human health, there seems to be at least one disputing the study’s findings. While there’s no dispute on the threat to aquatic life, the complex chemistry of aluminum in water complicates decisions about how to reduce the risk. Scientists have suggested that toxicity could be caused by a combination of sulfification and ionic-regulatory disturbance (aluminum binding to fish gills), but there isn’t clarity on which of these is the true cause of chronic or acute toxicity nor is it clear how toxicity is affected by water quality conditions such as pH or water hardness. EPA is upfront about these challenges; the agency included footnotes with its 1988 guidance that list a number of circumstances that could merit proposing alternative criteria.

The most disputed recommendation has been the chronic value of 87 µg/L. EPA proposed the limit based on studies of a number of species, but principally on two studies for brook trout (60-day exposure) and striped bass (seven-day exposure and, importantly, conducted only at pH 6.5–6.6). The brook trout suffered some minor effects, but the striped bass results were striking. After just seven days at 174.4 µg/L, 58 percent were dead. In contrast, after seven days at 87 µg/L, there were no deaths. While some would (and did) suggest that these results signify that 87 µg/L is safe for fish, a seven-day test isn’t long enough to be considered a chronic test by EPA standards. With no true chronic test for striped bass to provide additional clarity, EPA based its recommendation on the 87 µg/L “no effect” level for the bass, presumably concluding that if the test were extended to an appropriately chronic length, a concentration higher than this recommendation would lead to striped bass fish kills reminiscent of what occurred at 174.4 µg/L.

No matter what value EPA sets, it will not be an optimal criterion for all scenarios. By definition, national recommended criteria are set to be protective for aquatic life across the entire United States. Every single river in the country cannot possibly require as stringent a limit as the most sensitive waters home to the most sensitive species. This is especially true when, as we see with aluminum, there is significant variability in toxicity across species and across pH and hardness levels.

### National Recommended Aluminum Criteria for Protection of Aquatic Life

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<tr>
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<th>Acute (µg/L)</th>
<th>Chronic (µg/L)</th>
<th>Publication Year</th>
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<tr>
<td>Freshwater</td>
<td>750*</td>
<td>87†</td>
<td>1988</td>
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**Chronic:** Four-day average concentration exceeds criteria more than once every three years on average.

**Acute:** One-hour average concentration exceeds criteria more than once every three years on average.

*EPA footnote specifies that this value for aluminum is expressed in terms of total recoverable metal in the water column.
†EPA footnote lists three reasons why a water-effect ratio might be appropriate: (a) the tests were conducted under low pH and hardness conditions; (b) total recoverable aluminum may measure less toxic forms of the metal under certain water conditions; and (c) field data show that many high quality waters in the United States contain more than 87 µg/L.

EPA's national recommended aluminum criteria have proven to be contentious, both in development and implementation. Compliance can be extremely costly and difficult. The qualifying footnotes and caveats have provided states and industry groups an opening to challenge the applicability of these strict limits at a local and state level.

### Mining for Change

A number of states consider the recommended aluminum criteria set by EPA to be troublesome and overly conservative, and generally the states piping up are the ones finding themselves over the limit and facing costly cleanup programs that are fast approaching. Those fighting the hardest for less stringent alternative criteria are in mining country, and the heavy lifting required in conducting scientific studies to validate alternative criteria has very often been funded by the effluent-producing mining industry. To reassess national criteria set by EPA, regulations permit two general methods: recalculating the water-effect ratio and water-effect ratio. A recalification is allowed if sensitive species used to set national guidelines are not present at a site and may be removed from the toxicity calculation, resulting in less stringent criteria. A water-effect ratio may be developed if physical and/or chemical characteristics of the surrounding water are known to affect the bioavailability or toxicity of a chemical. Standards can then be set to take into account this variability. The procedures can be combined, but given the costs involved, a reassessment with one or both methods is unlikely unless the impact will be momentous. Cue the entrance for several western states.

The first forays into developing alternative criteria for aluminum occurred in New Mexico, Arizona, Colorado, and Nevada. In 1995, the Arid West Water Quality Research Project was conducted to recommend appropriate water quality criteria in the region’s rivers, many of which receive substantial flow from treated effluent. This research as well as other related studies found high levels of aluminum in streams in these arid western states. The studies also showed that aluminum had nontoxic properties under certain local water conditions.

In 2010, the Colorado Mining Association fired some of the first official shots at EPA’s recommended aluminum criteria. In proposing that the criteria be revisited, the CMA argued that the studies EPA used to set the chronic value didn’t even meet EPA’s own guidelines for chronic studies, and that, more importantly, the Arid West project and other newer studies showed that water hardness makes aluminum significantly less harmful. The CMA proposed that aluminum limits be set at much higher concentrations as hardness increased.

In its rebuttal, EPA refused to give much ground on the numerical values. The agency recommended keeping the criteria at the nationally recommended levels, with one minor concession in a revised footnote—hardly a sweeping reform. But the CMA pushed back and ultimately proved persuasive. Later in 2010, EPA finally approved hardness-scaled criteria, resulting in significant increases in aluminum limits for some of the hard waters of Colorado into which mining effluent is discharged. In 2012, New Mexico followed Colorado’s lead and also achieved approval for a hardness-dependent equation for aluminum.

### West Virginia Rebooted

In early 2013, West Virginia, a mining state on the other side of the country, proposed its own hardness-based alternative aluminum criteria. But the proposal didn’t sit well with environmental organizations or EPA. The question of water quality in stream chemistry to eastern water ecosystems raised concerns as did West Virginia’s push to fast-track its proposal through the legislative rulemaking process. (Speedy approval would mean the coal and quarry
industries could avoid the serious water treatment costs associated with complying with EPA’s recommended criteria.

Moreover, while West Virginia proposed the same numerical values for its criteria as Colorado and New Mexico, there was one crucial distinction: West Virginia measured dissolved aluminum, not total recoverable aluminum as was the case in Colorado and New Mexico. Using dissolved as opposed to total recoverable metal has been an ongoing debate, and after the 1988 aluminum criteria were developed, EPA changed its official guidance in 1993 to recommend using dissolved concentrations in setting state water quality standards. The thinking is that a dissolved value more closely represents the toxic bioavailable fraction of a metal in the water column. Still, Colorado and New Mexico played it safe, reasoning that their use of total recoverable aluminum allowed for a conservative buffer in terms of toxicity.

EPA officials responded to West Virginia with an emphatic no. EPA’s reasons included recently released studies by the U.S. Fish and Wildlife Service of a species uncommon in arid western waters: mussels. The studies show that mussels may be, as EPA put it, “more sensitive to the effects of aluminum than other organisms for which EPA currently has data.”

The results of these studies have come as a surprise to many involved with aluminum and could reverse the course of the aluminum criteria conversation, which for years has been trending toward talk of less stringent criteria. The USFWS studies concluded that “hardness should not be considered in setting the standard to protect mussels,” and EPA has identified another study corroborating this conclusion. The entry of mussels into the discussion means that, in many areas, hardness-based aluminum criteria are likely on the way out.

Amid growing awareness that linking aluminum toxicity to hardness may no longer be considered an acceptable approach, a link to a different but related factor—pH—is getting increased attention. An article in Inside EPA’s Water Policy Report earlier this year said EPA is working on “additional data about pH interactions with aluminum toxicity across a range of species.” The timing is notable, considering an update to EPA’s national recommended criteria for aluminum is expected as soon as next year.

Acidity Matters

Aluminum chemistry expert James Edzwald, a University of Massachusetts Amherst professor emeritus, would presumably agree with a pivot in focus from hardness to pH. According to Edzwald, “It is not hardness that affects aluminum speciation, but the pH. Hardness is an indicator of alkalinity and pH. High hardness waters are more alkaline and would have higher pHs.”

Edzwald does not advocate more stringent limits, as EPA appears poised to recommend, but instead favors less stringent criteria under certain conditions. Aluminum experts, Edzwald has written, generally agree that positively charged aluminum forms are the toxic forms to fish. These forms are readily found in waters with a pH of less than 7, with their presence increasing as pH increases. In fact, there is little positively charged aluminum in waters of pH 8 and higher. The 87 μg/L criterion was developed based on tests in water at pH 6.5-6.6. At this pH most of the dissolved aluminum is positively charged and toxic, but Edzwald states that there would have been far less positively charged aluminum and less toxicity at a higher pH. “This and the fact that most of the dissolved aluminum in freshwaters is complexed to organic matter,” writes Edzwald, “make the regulation far too restrictive and unrealistic.”

The vast majority of waters in Massachusetts are in the 6.6-7.4 range, according to Woodard & Curran’s Paul Hogan, and therefore likely merit further investigation. If and when that work is done, researchers may wish to consider another of Edzwald’s statements: he recommends more refined techniques to make sure that samples report only the aluminum that is truly dissolved and potentially toxic.

While the possibility of new and improved research is welcome, the impact of the current aluminum limits and the possibility of more stringent criteria are what matter right now in many places, including water and wastewater treatment facilities in the Northeast. In fact, in Manchester, New Hampshire, the limits have been the focus for a very long time.

Local Impact

NEIWPCC Commissioner Fred McNeill, chief engineer in the City of Manchester’s Environmental Protection Division, and Rick Cantu, superintendent of Manchester’s wastewater treatment plant, found little solace in the approvals in Colorado and New Mexico. With both those states heavily influenced, in the quality of their waters and the political sway of their leaders, by the mining industry, it is mining coalitions that have been paying for additional studies and pushing for higher aluminum limits. But the high costs required to comply with the national recommendations aren’t limited to mining states. Regarding the Manchester treatment plant’s draft permit, which was issued in 2008 and included an aluminum limit that would require new technology, McNeill says, “It would have been $20 million to...
In 2011, Manchester issued a report showing that background, non-anthropogenic aluminum levels in the receiving Merrimack River were already above the EPA limit under certain flow conditions, and that aluminum in the wastewater plant’s effluent was generally below the stream’s level (though still above the EPA limit). Meanwhile, the New Hampshire Fish and Game Department reported only good things about fish populations in the area. “Obviously if you have a background of 140 µg/L and 87 is supposed to kill them, something is going on,” Cantu says. As for how to address this disconnect, Cantu says, “If it’s naturally-occurring, there is no right way to adjust [the aluminum levels]. We can all discharge zero aluminum, and it’s still going to be 140.”

Nevertheless, regulations that state effluent pollution levels can’t be higher than the state limit, even if a receiving river is already above the limit. This makes sense if a river’s high aluminum level is due to anthropogenic sources (the effluent would still technically be contributing to levels that are above what’s natural), but it makes a lot less sense when a river is naturally rich in aluminum.

Further complicating the issue, facilities often face competing limits. Paul Hogan described a recent case in Greenville, New Hampshire, a town of roughly 2,000 people, where very low phosphorous, aluminum, and copper limits are all included in the permit for the town’s wastewater treatment facility. The problem: one of the best and least expensive ways to meet a phosphorous limit is to add aluminum as a coagulant. As a result, the Greenville facility is left to face noncompliance with at least one of these two competing limits or explore alternative treatment solutions. “For Greenville to meet all three of those limits,” Hogan says, “it will cost them $4 million to $6 million.” Consider too that the town has only a small number of residents to help cover the cost through higher sewer rates.

Permission to Complicate

Given the uncertainties about aluminum toxicity and the significant costs associated with treatment, why do some states continue to press the issue? In the Northeast, New Hampshire and Massachusetts have little choice. They are two of the four so-called non-delegated states in the country, which means EPA drafts their National Pollutant Discharge Elimination System (NPDES) permits instead of the state. New Hampshire and Massachusetts play a significant role in the permitting process: there is dialogue between these states and EPA about proposed limits before the release of a draft and subsequent public notice period. Also, before a permit can be approved by EPA, the state issues a water quality certification which affirms that the permit is stringent enough to meet state standards. Finally, these states officially adopt the permits, and, once adopted, the permits are enforceable by both the state and EPA. Still, being non-delegated means the states relinquish some control. In cases where EPA proposes limits more stringent than what a state believes are necessary to meet standards, there is often little the state can do to change the permit limits.

EPA is in a tough position too, as it needs to write permits for non-delegated states that are consistent with the agency’s own national criteria or risk a deluge of lawsuits from environmental groups. The end result in some cases: permits that are potentially very costly for dischargers, which have every right to contest a permit, as Manchester did. Lack of an actionable solution in such situations and any substantial incentive to find a solution tends to leave all parties in an uneasy state of uncertainty. In Manchester, McNeill and Cantu have yet to receive a response to their 2011 report and can only guess at what will happen next. “My gut feeling is that EPA will delist this portion of the Merrimack River,” Cantu says, “or they will just drop the whole issue. And I don’t think they are willing to drop it.” Hogan has seen how this plays out at the municipal level. “It puts a community in an uncomfortable position,” Hogan says. “If I’m a town councilor, I can meet my permits but I’m spending $8 million in a community that may be just hanging on by a thread economically. Either that or I have a potential litigation in front of me.”

Forward Thinking

The revision to aluminum criteria in the works at EPA could clear things up significantly. “In the end, maybe these new studies document significant effects on aquatic biota, and aluminum limits should be five times lower than they are now,” Hogan says. “If that’s what the correct answer is, then we need to control aluminum discharges. But I think the evidence to date says that maybe the way [the aluminum limits] are currently applied—with one value that is measured in total aluminum instead of dissolved and that does not adequately take into account local water conditions and the presence of sensitive species as local biota—is not the right answer.”

If stricter limits are set, states and dischargers such as Manchester’s treatment plant will most likely need to concede and somehow find a way to pay for aluminum treatment upgrades. As an alternative, they could try to prove that sensitive species are not inhabitants of the river in question and that aluminum levels above the new proposed limits would not be harmful to aquatic life under the background conditions in the river, such as higher pH levels that mean lower toxicity. But the studies required to try to get this proof would be costly, and even if the money is found, research can be unpredictable: it’s no guarantee that the studies will support an argument for less stringent criteria. Moreover, EPA’s track record and current trajectory on this issue suggests the agency will not be quick to approve concessions. With regard to the presence or absence of mussels in a river (increasingly critical to criteria calculations), arguments could go in circles. It’s easy to imagine one side arguing for limit leniency due to a lack of mussels in a water body while the other side points a finger at aluminum as the reason the mussels are missing.

Hogan sees a bleak future for this modus operandi, regardless of the conclusion of the EPA criteria revision. In the business-as-usual scenario, aluminum limits will continue to be issued in permits, and small groups of individuals and communities will be forced to deal with the issue only when faced with extremely costly treatment alternatives. Piecemeal site-specific changes may be achieved as a result, but they will come at a high cost to these communities and won’t address or solve the bigger problem.

An alternative path exists. With dedicated regional commitment to providing technical expertise and financial resources, a few case studies could be designed for representative Northeast sites. Tests of aluminum toxicity under these conditions would apply to a range of rivers in the Northeast with similar ambient water chemistry. The Massachusetts Department of Environmental Protection used such an approach to adopt revised limits for copper. After Connecticut changed its copper criteria, MassDEP showed that Massachusetts’s rivers had similar characteristics to those in Connecticut’s supporting studies. The result was similarly revised copper criteria in Massachusetts with much less time and effort than initially expended in Connecticut.

EPA’s commitment to revising the criteria indicates aluminum is a priority for the agency, and the judicious mindset of most stakeholders is to wait for the EPA revision before making significant decisions. Given the ostensible direction of this revision, even more stringent limits may be headed our way. Reacting to these new limits, either through compliance or contention, could cost a range of stakeholders time and money that are already in short supply. The aluminum conundrum may be just beginning.

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Learn and Earn

It’s fall, and that means a whole new season of classes from NEIWPCC’s training programs! Learn something new and expand your skills, while earning essential training credits. Visit neiwpcc.org/training/calendar.asp to access the course catalog for our regional training program; the class schedule for the Massachusetts Wastewater Operator Training program (which we coordinate for the state); and the latest offerings from JETCC, our training arm in Maine. You’ll also find a link to online registration and a course calendar, color-coded by state. Click on a class and you get not only a complete description of the material to be covered, but also the latest information on available seats, date or time changes, and more. See you in class!
Case of Obstruction 

continued from page 1

request.” New signs were posted that highlighted the importance of a healthy sewer, the need to avoid backups that could curtail the use of toilets and showers, and the fact that repair costs are ultimately borne by residents. “That worked,” Young says. For those servicing the Appleton Mills pump station, clogs caused by wipes are a thing of the past.

If only that were the case everywhere. In the United States and across the world, clogs are all too common. If not properly disposed of, nonwoven fabrics—such as wet wipes, baby wipes, and shop rags that are bonded together by entangling fiber or filaments mechanically, thermally, or chemically (rather than by weaving together yarn-like fibers). That gives nonwoven fabrics tremendous tensile strength, making them difficult to break down. Clumps of these fabrics can destroy a pump by wrapping themselves around a pump shaft. At the very least, the products can clog a pump and significantly reduce its efficiency and useful life. Wastewater treatment plant operators have nicknamed this phenomenon “ragging” as they find themselves spending more and more time pulling what appears to be dirty mop-heads from pumps.

To be sure, nonwovens aren’t the only unwelcome presence in sewer lines. Toys, glasses, cell phones, dentures, weapons, money—pretty much anything that happens in a sewer line. They have found their way into sewers. So, the systems work. But Portland or any other municipality in America doesn’t have a bottomless budget to install sophisticated screening devices everywhere and support their operation and maintenance. They are left to their own devices to solve the problem themselves. And if they do somehow pass through screens, they’ll be pulverized by pumps with hardly a hiccup. Nonwoven fabrics aren’t so easy to digest.

“People assume when they flush the toilet, [the nonwovens] are gone, never to be seen again,” says Jay Pimpare, regional pretreatment coordinator at EPA Region 1 (New England). “But 15 feet, 20 feet, 2,000 feet, 3,000 feet... somewhere along the line, it’s going to clog.” The prevalence of such obstructions has spawned a variety of efforts in recent years to reduce the frequency of clogs and their impact. And so far, attempts to legislate a solution haven’t succeeded. In Maine and two other states, there have been failed efforts to pass laws banning the sale of nonwoven products labeled as “flushable” unless they meet a standard ensuring they’re safe to be flushed. Aubrey Strause, owner of Verdant Water (a Maine-based stormwater and wastewater management firm), was intimately involved with the January 2011 legislative effort in Maine, and says failure happened for a reason. “We hadn’t clearly addressed in our legislation who would do the enforcement,” says Strause, current president of the Maine Water Environment Association (formerly the Maine WasteWater Control Association). “Who would look at every product coming into Maine?” The absence of an organization with resources to test all products against an agreed-upon standard for flushability—and with authority to punish manufacturers that do not comply—makes a_legislated ban_a largely unrealistic option at the moment.

So Maine took a different route. After the Maine Legislature discussed but didn’t pass the nonwovens bill, interest picked up in a pilot education campaign being developed by the Maine WasteWater Control Association, Portland Water District, and the Association of the Nonwoven Fabrics Industry (still commonly known as INDA, the acronym created by the shortening of the group’s old name, the International Nonwovens and Disposables Association). In August 2013, after two years of talks, the partners agreed on baby wipes as the campaign’s target product, avoiding the question of “What does ‘flushable’ mean?” that was playing out at the same time on the national level. (Both the Maine Water Environment Association and INDA agree that baby wipes are not designed to be flushed, and both have collected data showing that 40 percent of baby wipes are bought by consumers for a use other than on a baby.) With the target identified, a marketing firm was hired to develop the campaign, which got a title, “Save Your Pipes: Don’t Flush Baby Wipes,” and a delivery strategy: over an eight-week period in early 2014, the message was spread through clever TV spots featuring a game show called What the Flush?! (view them at saveyourpipes.org) as well as signs posted in grocery stores urging buyers of baby wipes to keep them out of the toilet. The campaign drew plenty of attention, beginning with a January 2014 media event with top state and municipal officials that attracted widespread news coverage. During the event, Portland Water District General Manager Ron Miller succinctly stated why something needs to be done. “[Clogs from nonwovens] have forced us to shift our resources from ongoing maintenance and newly need system improvements,” Miller said, “to reacting to these clogs and getting the systems back online.”

From Learning to Leading

In May, NEIWPCC held a workshop in Chelmsford, Mass., for wastewater professionals from throughout New England to address the issue of clogs caused by flushed wipes and by fats, oils, and grease (a.k.a. FOG) poured down the drain. Given the attention generated by the Maine campaign, Strause was a natural choice to be one of the speakers. She delivered an inspirational talk about the work being done in Maine and around the country and shared fascinating details about a study completed by the Maine WasteWater Control Association, Portland Water District, and INDA in 2012. The group examined items caught by one of the Portland Water District’s two specialized screening systems and systematically categorized nonwoven fabrics...
by type, separating baby wipes, “flushable” wipes, cosmetics removal wipes, paper towels, and so on. In many cases, the team even determined the brand of an item, using details such as weave pattern and shape. The next step was visiting stores that sell wipes to examine the packaging of products found on the screens. Some were explicitly marketed as flushable, but the majority came from packages neither labeled flushable nor with clear disposal instructions.

The 2012 study led the Maine team to more vigorously pursue solutions, including the Save Your Pipes campaign. “This is a preventable issue,” Strause said at the workshop. “It’s a waste of money for utilities to deal with these clogs on an emergency basis. Contrast that to those who should know, including the Congressional Budget Office and EPA, it could make more than $300 billion over 20 years to address the nation’s sewage collection and treatment infrastructure needs—making it absurd to be spending precious resources on clearing preventable clogs. But until products are consistently and prominently marked flushable, we still find on screens.”

In the post-campaign graph, however, take special note of the increases in the latter half of the post-campaign sorting. The increases indicate a fading over time of the TV spots’ effect on behavior and underscore the need for continual televised outreach, which is unlikely to be affordable for the average utility or municipality.

Standing in a store, looking at products touted as flushable and as having been engineered to be safe on sewers, how do you know what to believe? In a demonstration at NEIWPCC, we placed in a water bottle a wipe from a box of Walmart’s house brand, Equate, that was labeled, “Breaks Apart After Flushing.” After vigorous agitation over several days, the wipe was still intact. Conversely, a wipe from a box of Scott Naturals Flushable Cleansing Cloths, labeled virtually identically, “Breaks Up After Flushing,” dispersed quickly with minimal agitation.

INDA publishes a Code of Practice which states that products with significant potential to be disposed via the toilet should still have a Do Not Flush logo on the packaging unless they fully pass INDAs’s flushability guideline known as ED3 (and can therefore be marketed as flushable). But participation in INDAs’s Code of Practice is voluntary, and not every wipe manufacturer is a member of INDAs. “As of April 2014, only three of the products labeled flushable [for sale in Maine] had actually passed INDAs’s guideline,” Strause says, “and some of those products, we still find on screens.”

Indeed, many independent experts think ED3 isn’t strict enough to be the standard for flushability. To meet the guideline, a product must pass each of a series of tests, but the process was written entirely by INDAs with limited input from wastewater associations. Although toilet paper is considered the benchmark for flushability since it disperses to an unrecognizable state within minutes of entering a collection system, ED3 allows for significantly more time. For instance, there’s a slosh box test that determines product dispersion after three hours of incubation in agitated water; another test, measuring anaerobic biodigestion, simulates product dispersion 28 days after arrival at a treatment plant. Contrast that with typical collection system retention time, which is often measured in minutes rather than hours or days. According to critics of ED3, the tests don’t accurately reflect conditions in most wastewater systems nor do they capture potential interaction with other materials in a sewer such as fats, oils, and grease, as occurred to an alarming level in London.

A Matter of Perspective (and Behavior)

How we find ourselves in this situation is due in no small part to economics. While the wastewater industry wants a stricter standard for flushability, with a Do Not Flush label clearly visible on products that fail to meet this tougher new guideline, wipe manufacturers understandably want to maintain their revenue stream and continue to sell products that satisfy consumer demand. The additional research and development associated with trying to meet a stricter flushability standard comes with a cost. And if a product fails to meet the standard? A Do Not Flush logo is fundamentally different from other standardized logos such as USDA Organic and Certified Gluten-Free, which are considered brand enhancements. Manufacturers argue that a prominent Do Not Flush logo would likely diminish a product’s appeal and potentially force a price reduction to offset the impact. Small wonder that many makers of wipes aren’t racing to embrace a get-tough approach on flushability.

And after all, industry isn’t solely to blame. True, some manufacturers are guilty of selling products as flushable when they really shouldn’t be flushed. But many people are flushing things down the toilet that were never intended for that disposal pathway. Ideally, all manufacturers would label products correctly and consumers would follow disposal instructions to the letter. Is there an organization capable of making this happen? INDAs can create a standard but has no real authority to enforce it. Non-profits such as the Maine Water Environment Association have limited resources. “It shouldn’t be up to one little wastewater association, one state at
a time, to deal with this,” says Strause. EPA seems like an obvious choice, being an entity familiar with creating and enforcing environmental rules. But the agency’s authority is curbed when it comes to individual behavior. “We play a limited role here,” says EPA’s Pimpare. “It’s not that we don’t want to play a larger role, but we don’t regulate households. Unfortunately, EPA doesn’t get down to that audience.” Another government agency, the Federal Trade Commission, has gotten involved and rightfully so, given a core aspect of its work is to ensure manufacturers can substantiate advertising claims. The FTC has been looking into claims of flushability made for specific products and even taken action against manufacturers in some cases. But investigating products, one at a time, is an arduous, slow process. “It’s not efficient,” Strause says. “The products are coming to market much faster than the FTC can possibly conduct investigations.”

With no obvious route to a solution, it’s up to those who feel strongly about this issue to keep trying to make a difference. On September 23, the New Hampshire Department of Environmental Services conducted a workshop similar to the one held by NEIWPCC in May. Elsewhere, the National Association of Clean Water Agencies, Water Environment Federation, American Public Works Association, and INDA have formed a technical workgroup that has held a series of meetings to characterize the impacts of nonwoven fabric wipes on sewer systems, make recommendations for actions, and develop a process for implementation. (The Portland Water District’s Scott Firmin, who has been heavily involved in the work in Maine on wipes, is a workgroup participant.) The workgroup is presenting its findings in New Orleans in October during a session at WEFTEC, the always heavily attended national conference for water quality professionals.

All the work is generating attention—and recognition. On April 22 in Boston, EPA Region 1 presented INDA, the Maine WasteWater Control Association (now the Maine Water Environment Association), and the Portland Water District with an Environmental Merit Award for the Save Your Pipes campaign, saying the effort had “successfully reduced the amount of wipes clogging systems.” The campaign also earned a 2014 Environmental Excellence Award from Maine Governor Paul LePage and Maine Department of Environmental Protection Commissioner Patricia Aho. In response to receiving the awards, Strause said, “This campaign appears to have been successful, but the message is one that needs to reach consumers around the country. Consumers need to be consistently reminded that baby wipes are never flushable, so our next step is sharing the campaign materials with everyone else fighting this problem.”

Strause is confident that the success of the campaign in Maine will help push the initiative into other states. The campaign media, including the TV ads and signage, are available for free to any organization that would like to start its own Do Not Flush initiative (see links below), and already a few utilities, including one in Cheyenne, Wyoming, are taking advantage of the offer. Changing behavior is never easy, but it can be done. And, for now, it’s the best weapon we have against this increasingly common and costly problem.

Greg McNeal, a 2014 graduate of UMass Lowell, developed the initial drafts of this article during an internship at NEIWPCC headquarters. For additional general information on clogs and wipes, visit

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**Full House, Packed Agenda**

The final meetings of the fiscal year of NEIWPCC’s Executive Committee and full Commission took place in Avon, Connecticut, on September 11 and 12. Representatives from all our member states took part in fruitful discussions on issues ranging from harmful algal blooms to the potential impacts of federal budget developments. NEIWPCC staff updated the Commissioners on various projects, including our work on storm resiliency and recovery and our latest training initiatives. Special guests included


Television’s Dr. Oz delivered an entertaining, informative take on this issue in an episode that originally aired on September 9, 2014. The segment is available online in two parts and can be accessed by searching “flushable wipes” at www.doctoroz.com. In Part 1, Dr. Oz tours New York City’s Newtown Creek Wastewater Treatment Plant to get a feel (literally) for the problem. In Part 2, he conducts a flushability experiment and interviews Cynthia Findlay of the National Association of Clean Water Agencies. It’s worth a look.

Paul Niedzwiecki, executive director of the Cape Cod Commission, who spoke about efforts to solve what he called the Cape’s biggest environmental problem—the runoff of nitrogen that has spawned devastating algae blooms in estuaries and bays.

The meeting concluded with the annual election of officers, with the Commissioners endorsing a second one-year term for current chair, Yvonne Bolton of Connecticut’s Department of Energy and Environmental Protection, and vice-chair, Beth Card of the Massachusetts Department of Environmental Protection. Dick Kotelly will continue to serve as treasurer, as he has done so superbly since 1995. For a schedule of upcoming NEIWPCC Executive Committee and Commission meetings as well as a full listing of other water-related events, visit newpcc.org/calendar.asp.

NEIWPCC Chair Yvonne Bolton (center, white shirt) listens intensely during a presentation on day two of our Commission meeting in Avon, Connecticut.
Balancing Act
continued from page 3

Lake is sacred to the Onondagas and to the other five nations in the Haudenosaunee Confederacy (more commonly known by the French term Iroquois). A recent written statement by the leaders of the Onondaga Nation reads, “The Lake, its waters, plants, fish, shorebirds, and animals are an intrinsic part of our existence.” And as the Nation sees it, the capping of industrial waste is simply procrastination, a postponement of the real work that must be done and the real commitment that must be made to fully restore the lake to its natural state, a state in which people can safely drink the lake’s water and eat its fish. The achievements so far don’t quite measure up in the Nation’s eyes—and that makes reaching inclusive decisions an often challenging task.

Partner for Progress
One of Clinkhammer’s primary responsibilities is to facilitate public awareness of and engagement in decisions that impact Onondaga Lake. She does this by regularly organizing meetings of the Onondaga Lake Watershed Partnership, which brings together a diverse group, including staff of local and regional environmental nonprofit organizations, representatives of the Onondaga Nation, consultants for Honeywell, and officials from the City of Syracuse, Onondaga County, NYSDEC, and EPA.

With input and facilitation from Clinkhammer, attendees at the meetings worked to establish a list of principles to guide attention to the needs of the lake, its tributaries, and its watershed—and given the range of interests and views among the group, this process took a while. After four meetings between November 2013 and May 2014 discussing potential priorities, the group established principles meant to serve as foundations for future action but not as substitutes for detailed plans. The list includes restoring habitats for native plants, fish, and wildlife; enhancing public access to the lake and its waterways; and reestablishing land for the Onondaga Nation at Onondaga Lake. (Currently, the city of Syracuse separates the 11 square-mile territory of the Onondaga Nation from the lake.)

The successful establishment of the principles is a clear sign consensus can be achieved. But there’s plenty of other evidence of the breadth of the gulf between parties. As Clinkhammer strolled on that day in May, she talked about the trail’s grand opening just a few weeks earlier, for which she organized an event with booths hosted by local organizations and businesses. She said the Onondaga Nation declined the invitation to participate because it did not want to show support for leaving any amount of waste, toxic or otherwise, in the lake and along the shore.

The Nation voiced the same concern in a comment letter to Onondaga County regarding a proposed amphitheater on the wastebeds. The Nation’s general counsel, Joseph Heath—who submitted the letter on the Nation’s behalf—wrote, “The County should consider the negative cultural impacts of a project that institutionalizes a permanently polluted landscape on and around the Lake, precludes additional remediation, and obstructs the potential to create a sustainable, functioning Lake-wide ecosystem.” The letter also describes other amphitheater concerns, which are rooted in the Nation’s cultural and historic relationship to the lake and its shores. Heath asserts that the current proposal fails to make clear how the county, as it builds and runs the amphitheater, will avoid causing problems such as erosion, degradation of wetlands and wildlife habitats, and damage to the caps covering the wastebeds—damage that could result in public health risks.

Walking along the trail, Clinkhammer pointed out the proposed location for the amphitheater. For now, it’s all trees and brush, and what happens with the idea remains to be seen. (In Heath’s letter, the Nation encouraged Onondaga County to consider alternative locations.) But the divide over the amphitheater perfectly illustrates why there’s a need for her work, for her ability to respect all points of view and to raise awareness of them. “The night before the walk, she gave a talk about Onondaga Lake to 20 people, mostly from the Sierra Club’s local chapter, which organized the event. She began with a brief history of the lake, starting in the tenth century. “The Haudenosaunee Confederacy, the oldest participatory democracy in North America, was established at Onondaga Lake,” she said. Clinkhammer went on to describe remediation of industrial pollution at several locations in the watershed, including in two tributaries to the lake, Geddes Brook and Ninemile Creek. In both places, Honeywell recently removed contaminated sediment and is currently finishing habitat restoration.

Nation’s Interest
One of the audience members at Clinkhammer’s talk was Thane Joyal, an attorney who works with Heath to represent the Onondaga Nation. On most days, she and Heath work out of offices in a spare, one-story building in a modest Syracuse neighborhood. On the day after the Sierra Club talk, Joyal shared her thoughts as the afternoon sun filtered in on her plants and crowded bookshelves.

“The [Onondaga] Nation is being, I think, courageous and very persistent, to continue to try, within the limits of its resources, to do what’s best for the lake,” Joyal said. “If you want to make an authentic depiction of the Nation’s relationship to the lake, you have to take in how much they care—really, really care—profoundly.”

Mudboils, such as this one near Onondaga Creek, are natural phenomena that may be exacerbated by human activity. They occur where underground pressure forces water and fine sediments to the surface. As overlying sediments settle into spaces where water had existed, depressions form. Sediments flowing from mudboils cloud Onondaga Creek, degrading the stream ecosystem. At high flows, the stream carries some of these sediments to Onondaga Lake. Photo reprinted with permission from: Kappel, W.M., 2014, The hydrogeology of the Tully Valley, Onondaga County, New York—An overview of research, 1992–2012: U.S. Geological Survey Open-File Report 2014–1076 (access at http://dx.doi.org/10.3133/ofr20141076).
Multiple Endeavors

Out on the trail, Clinkhammer described several projects designed to improve the health of Onondaga Lake and its watershed that are separate from the Superfund cleanup activities. For example, Lockheed Martin is doing a voluntary cleanup of its former factory site along Bloody Brook, a tributary to the lake. Elsewhere, Onondaga County is in the midst of various infrastructure improvements to reduce combined sewer overflows (CSOs)—that is, discharges of untreated sewage that occur when a sewer system that carries both wastewater and stormwater is overwhelmed by flow. The projects include construction of holding tanks at the regional wastewater treatment facility and installation of green infrastructure such as green roofs and constructed wetlands. The improvements have already led to an overall reduction of CSOs. So far, 26 CSO outfalls have been closed and stormwater runoff has been reduced by 100 million gallons a year.

In another important effort, members of the Onondaga Lake Watershed Partnership are working with NYSDEC and EPA to assemble an expert panel on mudboils, which are naturally occurring geological features that push sediment up from underground. Mudboils erupt unpredictably as a result of underground pressure, often appearing in new locations near existing mudboils. Upstream of Onondaga Lake, mudboils contribute sediment to Onondaga Creek, making it cloudy. This turbidity undermines the health of the stream ecosystem by blocking sunlight to plants and algae that are critical in the stream’s food web. Over time, high stream flows carry fine sand and silt downstream, eventually washing them into the lake.

The Onondaga Nation School is also on Route 11. Like the arena, it’s a solid, well-maintained, attractive building. Just past the school, the buildings give way to open space: a channel, a dam, and a reservoir are bordered by a meadow and, in the distance, a forest edge. Cellular service is poor there, but the sounds of birds and crickets fill the air.

Sitting in her office, Joyal said, “Things have improved to a degree. The Nation has better access to information and isn’t routinely excluded [from important meetings].” I think the Nation is respected by the regulators and the decision makers, so there’s a lot to celebrate in that. I have every faith that the lake will be completely cleaned up at one point, though it’s not likely going to be in my lifetime. But we need to be respectful of the fact that we can do things in our lifetimes that can improve the possibility of full cleanup and restoration of the lake.”

Effective, sustainable plan rather than by pursuing separate, uncoordinated, and often highly costly efforts to meet various permit limits. “Progress has been made on integrated planning,” Poltak said, “but there is still a lot to be done.”

Few would disagree. In June 2012, EPA issued its finalized Integrated Municipal Stormwater and Wastewater Planning Approach Framework, in which the agency outlined its principles for allowing communities to create a schedule that prioritizes on—and directs any available funds to—wastewater and stormwater projects that yield the greatest water quality benefit for the monies invested (in other words, offer the biggest bang for the buck). Since then, a small

Call for Progress
Washington Hearing on Integrated Planning Draws Spirited Testimony from NEIWPCC’s Poltak and Others

BY STEPHEN HOCHBRUNN, NEIWPCC

A s one of four witnesses to testify at a hearing of the House Transportation and Infrastructure Committee’s Water Resources and Environment Subcommittee on July 24, NEIWPCC Executive Director Ron Poltak began gently, emphasizing he spoke from experience. “I started my career with Senator Muskie writing his case, forcefully. Speaking on behalf of the Association of Clean Water Administrators (ACWA), Poltak explained the need to maximize the effectiveness of limited dollars for desperately needed wastewater infrastructure improvements and described the failure, so far, to make the kind of headway that is needed on EPA’s integrated planning framework, the primary focus of the hearing. In integrated planning, municipalities may achieve the water quality objectives of the Clean Water Act by integrating permitted wastewater and stormwater projects into one cost-effective, sustainable plan rather than by pursuing separate, uncoordinated, and often highly costly efforts to meet various permit limits. “Progress has been made on integrated planning,” Poltak said, “but there is still a lot to be done.”

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The territory of the Onondaga Nation is a few minutes’ drive south of the law office along Route 11, a four-lane highway. The view from the road is of fields, forests, and occasional warehouses and homes. A convenience store serves as a subtle marker of the territory’s northern border. The Onondaga Nation operates the store to fund services such as a fire department and waste transfer station. (As an autonomous and self-governing entity, the Nation does not pay taxes to the state or federal government nor accept aid from them.) Further down Route 11 is an impressive, modern athletic complex that houses the Nation’s indoor lacrosse and hockey arena. Past the arena is a neighborhood comprised of small ranch-style homes, some prefabricated, and mobile homes. The Onondaga Nation School is also on Route 11. Though they are natural features, mudboils may have been exacerbated by people, primarily through mining, and might be cured by people, with engineering. For years, Onondaga County, EPA, NYSDEC, and the U.S. Geological Survey have been devising and implementing various strategies to stop the flow of sediment from the mudboils. They have found only temporary fixes up to this point, but the expert panel will be taking a fresh look at the hydrogeology of the area in hopes of finding a more permanent solution.

Clinkhammer, who grew up in the Syracuse area, seems energized, not daunted, by the complexity of the Onondaga Lake watershed. “I’m working with representatives of the Onondaga Nation to plan some events that the Nation will support,” she said, “like possibly a speaker series.” In Clinkhammer’s job, patience and persistence are prerequisites. By all indications, she has plenty of both.

* * *

The witnesses await the start of the July 24 congressional subcommittee hearing on integrated planning. Left to right: David Berger, mayor of Lima, Ohio (representing the U.S. Conference of Mayors); Todd Portune, Hamilton County, Ohio, Board of Commissioners; Stephen Meyer, director of environmental services, Springfield, Missouri (representing the National Association of Clean Water Agencies); and Ron Poltak, executive director, New England Interstate Water Pollution Control Commission (representing the Association of Clean Water Administrators).
number of cities have spent time and resources developing integrated plans, but none have received EPA approval. “I am concerned that two years have passed since EPA released the final policy, and little seems to have been done to implement it,” said Bob Gibbs (R-Ohio), the subcommittee’s chair, in his opening statement at the hearing. Gibbs praised EPA for announcing earlier this year the availability of some federal funding to a few communities for technical assistance in developing integrated plans, but expressed frustration with the pace of change. “It is time for the national clean water strategy to evolve from a one-size-fits-all mandate and enforcement approach,” Gibbs said, “to an integrated strategy that recognizes the individual public health needs and water quality benefits of water and wastewater utilities, and the resource limitations of communities.” Judging from everything said at the hearing, that stance has bipartisan support in Congress—and plenty of backing outside of Washington as well.

**Position Statements**

David Berger, the mayor of Lima, Ohio, testified first, representing the U.S. Conference of Mayors. He launched quickly into the heart of his argument. “Local government—not the federal government—is where the job of providing water and wastewater services gets done and is paid for,” Berger said. “We are on an unsustainable path when it comes to public water infrastructure investment and unfunded mandates. We must change or we will bankrupt communities and permanently impoverish households in those communities.” He provided examples from several cities, including his community of Lima, to support his claim that EPA’s regional offices (as opposed to EPA headquarters in Washington) were to blame for discouraging integrated plans despite their benefits, which can include relying on less expensive water quality improvement strategies like green infrastructure to control costs and minimize rate hikes on taxpayers.

Berger pushed for Congressional support of a draft bill, the Water Quality Improvement Act of 2013, that requires EPA to issue at least one integrated permit in each of the agency’s 10 regions within one year of the bill’s enactment. The bill would also ban EPA from imposing fines for past violations on anyone who is implementing plans to come into compliance. “The policy of requiring penalties simply extracts money from local communities that have nothing,” Berger said. “We will bankrupt communities and permanently impoverish households in those communities.”

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Speaking next, Todd Portune of the Hamilton County, Ohio, Board of Commissioners called for passage of the Clean Water Compliance and Ratepayer Affordability Act of 2013 (H.R. 2707), which requires EPA to develop at least 15 pilot “showcase” communities to develop and implement integrated plans. “The American people want clean water,” Portune said, “but they want it in ways that are flexible, affordable, and reasonable.”

Stephen Meyer, who leads the Department of Environmental Services in Springfield, Missouri, also had a bill to push. Speaking on behalf of the National Association of Clean Water Agencies, Meyer called on the subcommittee’s members to cosponsor the Clean Water Trust Fund Act of 2014 (H.R. 3862), under which communities with approved integrated plans could see their wastewater and stormwater permit terms extended to up to 25 years—allowing communities to do the type of long-term planning that’s difficult with the current five-year permits.

The bill also requires EPA to broaden the way it determines a community’s financial capability to pay for and schedule projects. Critics say EPA puts too much emphasis on a community’s median household income to gauge affordability—that is, the portion of the cost of a project that residents of a community could afford to cover via a rate hike.

Unlike his fellow panelists, Poltak didn’t come to push new legislation. Nor did he come to bash EPA. “Without EPA, we’d be nowhere with respect to the success stories we can share,” Poltak said. But he did have clear, concrete suggestions. “ACWA encourages EPA to begin exploring ways that integrated plan elements can be legally and effectively incorporated into a permit,” he said. “A model permit or case study completed in a state where EPA is the permitting authority could help tremendously to move the process along. We need a template, and we’re finding that we don’t have one.”

**Broadening the Discussion**

As the hearing progressed, the focus shifted continuously as subcommittee members raised issues of personal—and constituent—concern. While saying integrated planning is a good first step toward addressing the financial burden cities face under the Clean Water Act, Grace Napolitano (D-California) eloquently advocated for more to be done to address the impact of higher water costs on those least able to pay. “The poorer half of American households currently carries a disproportionate financial burden for public water services,” Napolitano said. “With the new Los Angeles County stormwater permit, this disproportionate burden will creep into the middle class. Mr. Chairman, we need to seriously look at this issue and try to find common sense solutions that protect public health and the environment but do it in a way that does not necessarily burden our low income and middle income residents.”

One exchange provided fodder for subcommittee members eager for evidence of regulatory overreach. After Rick Crawford (R-Arkansas), the subcommittee’s vice-chair, asked the witnesses to comment on how critical habitat designations can affect the permitting process, Stephen Meyer said Missouri’s environmental agency is working to adopt EPA’s newly developed water quality criteria for ammonia, which are designed to protect mussels in lakes, rivers and streams. As wastewater treatment facilities attempt to comply with the tighter ammonia effluent standards, Meyer said ratepayers will pay the price. “Missouri, unfortunately, is mussel-rich,” Meyer said. “Some of the smaller communities will see [water and sewer] rates increase from $32.75 a month to $854 per month just to address ammonia for mussels.”

Republicans on the subcommittee came back to this increase several times during the hearing, clearly seeing it as a sign of federal blindness to the on-the-ground impact of regulations. Throughout the hearing, the discussion veered often into the broader issue of unfunded mandates. On this, Poltak spoke cogently, with crisp, commanding gestures. Reflecting the deep concern in our region’s wastewater community about increasingly tight permit limits, particularly on nutrient discharges (which many in the industry feel have been reduced so low as to render further reductions financially untenable and environmentally inconsequential), Poltak said, “We cannot continue to ratchet down on treatment facilities and utilities.”

Poltak has long argued that the Clean Water Act needs to be revised to put more focus on—and more federal monies into—controlling nonpoint source pollution, which is now almost universally seen as a greater threat to water quality than contamination from point sources. Poltak told us, “I am concerned that to make the process on water quality that needs to be made, more support must come from Washington. “The fact of the matter is the greater good is served by federal dollars associated with clean water,” Poltak said. “We need help out of Congress, and without it, we can’t get the job done. The work becomes unaffordable, and the level of commitment and burden that is placed on our citizens is intolerable.”

**Uncertain (but Encouraging) Outcome**

Before banging the gavel to end the hearing, Gibbs said it was his intent and commitment to move forward with some legislation to address the witnesses’ issues. Just what form that legislation could take is unclear. As this issue of IWR went to press, there’d been no new movement in Congress on either H.R. 2707 or H.R. 3862, and the draft Water Quality Improvement Act of 2013 hadn’t gained any new traction either. (All three efforts, it should be noted, have some powerful opponents; in a letter sent to the subcommittee ahead of the July 24 hearing, representatives from four prominent environmental organizations—American Rivers, Clean Water Action, Natural Resources Defense Council, and Southern Environmental Law Center—argued at length against all three measures, saying they weaken Clean Water Act protections and undermine efforts to protect public health.)

The hearing, however, was a clear sign that some members of Congress are taking seriously the pressures that utilities and cities are feeling amid dwindling federal support for water infrastructure upgrades. Some seven weeks later came another indication. On September 10, Gibbs and Tim Bishop (D-New York), the Water Resources and Environment Subcommittee’s ranking member, took part in a news conference on Capitol Hill where the mayor of San Diego and other public officials joined private sector representatives in highlighting how investment in our nation’s water infrastructure creates permanent and much-needed jobs—$289,000, to be specific, over the next decade, according to a new report from the Water Research Foundation and Water Environment Research Foundation. At the news conference, Bishop said very careful consideration should be given to an idea that’s been around for years but has never gotten far in Washington: the establishment of a Clean Water Trust Fund, through which monies for water and wastewater upgrades would be generated by small fees on specific products (possibly bottled beverages). That Bishop would float such an idea wouldn’t surprise anyone who viewed the proceedings on July 24. During his prepared remarks at the hearing, Bishop made clear he’s looking for solutions at the federal level.

“If we remain committed to the goals of inhaled and swimmable waters, then we must be willing to commit to providing a portion of the funds to do so,” Bishop said. “Investing in our water infrastructure network is an investment in our nation’s future. Let us not short-change the public, the environment, and the economic health of generations to come by failing to support this critical infrastructure.”

Bishop’s words were a powerful call to action, a call that Poltak and the other witnesses echoed. If and how members of Congress will respond to that call is hard to say. But at least they’re talking. And listening.
Watchful Eyes
NEIWPCC’s IEC Staff Inspect Critical yet Often Overlooked Infrastructure

BY EVELYN POWERS, NEIWPCC/IEC DISTRICT

If people are familiar at all with what happens to what they flush down the toilet or pour down the drain, they’re probably aware of the role of wastewater treatment plants. Less well known is the system of pipes, pumps, and force mains that transport the wastewater to these facilities. At the Interstate Environmental Commission District, there is no such lack of awareness—in fact, quite the opposite. Pump station inspections are a key aspect of the work of the IEC District, which assists New York, New Jersey, and Connecticut on a wide range of air and water pollution matters. (NEIWPCC has served as the IEC District’s host since 2013.) For the IEC, which was established in 1936, this part of its inspection program is a relatively new responsibility and a highly important one.

The Issue and the Need

In a standard sanitary sewer system, wastewater from households and businesses is transported through underground pipes in part by gravity but also with the assistance of pump stations that help keep the wastewater moving through the system. In most cases, wastewater that enters a pump station is initially stored in a wet well. Many pump stations are equipped with bar screens or other equipment to remove debris that can clog and compromise pump performance. In this respect, pump stations act as small-scale wastewater treatment plants, performing pretreatment to assist with flow. When the level of the wet well rises to a specific design level, a pump or series of pumps is activated automatically and pumps the wastewater into a force main and away from the pump station toward the treatment plant.

Unfortunately, things can and occasionally do go wrong. Pump failures, power outages, and high flows that exceed capacity can lead to backups and overflows, possibly resulting in the release of untreated wastewater to the environment. It’s impossible to eliminate entirely the possibility of such problems, but the likelihood can be minimized. Taking steps to ensure the proper function and maintenance of pump station infrastructure—and the timely upgrading of equipment—are vital to ensuring an effective, safe wastewater collection system. That’s where the IEC District inspections come in.

The IEC District pump station inspection program was conceived in 2010 after meetings between IEC staff and representatives from the New York State Department of Environmental Conservation. The NYSDEC explained that, due to diminishing budgets, pump stations in Nassau and Suffolk Counties (NYSDEC Region 1) and Rockland County (NYSDEC Region 3) were not being adequately inspected. While the IEC District had no official program at the time for inspecting pump stations, there was plenty of experience to build upon: for many years, the IEC has inspected and sampled effluent from the roughly 70 wastewater treatment plants in its jurisdiction to ensure compliance with IEC District water quality regulations and NPDES permits.

Initially, IEC's pump station inspections were informal and performed, when possible, in conjunction with wastewater treatment plant inspections. Substantial refinements to the program occurred in 2013, when, with input from NYSDEC and EPA, IEC District staff expanded the pump station inspection checklist and prepared a quality assurance project plan (QAPP), both of which EPA Region 2 approved in May 2013. Based on discussions with regional environmental agencies, the staff developed a priority list of stations for inspection, and in the
I n the June edition of NEIWPCC’s email newsletter IWR, we introduced you to the University of New Hampshire Pee Bus—a shed containing three urinals attached to a 264-gallon tank, all connected to a large tank, where the urine is stored before being processed for use as a fertilizer. The future of the Pee Bus is unclear and depends in part on whether any current students pick up the reins. But the project continues to have an impact as it informs and inspires work on urine diversion.

Alyson Packhem, a University of New Hampshire senior who graduated this past spring, poses outside the University of New Hampshire Pee Bus—a shed containing three urinals attached to a large tank, where the urine is stored before being processed for use as a fertilizer. The future of the Pee Bus is unclear and depends in part on whether any current students pick up the reins. But the project continues to have an impact as it informs and inspires work on urine diversion.

BY ANNA D. MEYER, NEIWPCC

Next Steps
Discussing Prospects for Urine Diversion Following Successful UNH Project

On utility trailer—and the four University of New Hampshire seniors who designed it. If you read the article, you may recall that the students were motivated to build the vehicle by their knowledge that, on weekend nights, high concentrations of nitrogen from urine enter the wastewater treatment plant in Durham, N.H., where UNH is located. Given that removing nitrogen can be a substantial cost for a wastewater treatment facility, the students sought to lessen the burden on their town’s plant. Urine...
collected during the Pee Bus’s four pilot weekends on campus was diverted from the wastewater plant and stored to be donated to local farmers for use as fertilizer.

After the students who created the Pee Bus graduated, we took the opportunity to follow up with their advisors: UNH Professor of Engineering Dr. Nancy Kinner, who oversaw the students’ work, and UNH alum David Cedarholm, who, while serving as Durham’s town engineer, noticed the weekend nitrogen spikes at the treatment plant and approached Kinner to suggest that some of her students design a mobile collection unit.

Sitting in her small campus office in July as classical music from her computer softly filled the room, Kinner weighed in on the financial considerations of replumbing campus buildings for urine diversion. “It’s the economics and the practicality that has to be looked at now,” Kinner said. Depending on the plumbing of any given building, it could be expensive to alter a system that currently combines liquid from urinals with toilet waste. In discussing the potential cost, Kinner cited Cedarholm’s calculation that the plant’s treatment costs would be notably lower if the university diverted a minimum of 10,000 gallons of urine a year. Collecting that volume would involve retrofitting the plumbing in many campus buildings, but it’s conceivable that the investment (and the cost of maintaining the urine-diverting infrastructure) would ultimately be offset by savings on UNH’s utility bill if the wastewater plant has less nitrogen to remove. As the biggest user of wastewater services in town, UNH pays a large percentage of any costs the plant passes on to its ratepayers, and therefore would stand to gain the most from any savings. But would it be enough? That’s the key question. “If the costs justify it, I think UNH would do it, I really do,” Kinner said, “but it’s all about the costs versus the payoffs.”

As for Cedarholm, he is poised to build upon the students’ work by taking it in a different direction. During a conversation with him at the headquarters of Durham’s Department of Public Works, Cedarholm said he sees great potential for using urine diversion as a means of reducing nonpoint source nitrogen pollution from septic systems, especially in towns near estuaries and coastlines where nitrogen pollution can trigger algal blooms. Cedarholm was recently appointed to represent Lee, N.H. (where he lives), on New Hampshire’s Southeast Watershed Alliance. The alliance connects people living in the 42 New Hampshire communities located in watersheds that drain to the state’s coastal waters. Cedarholm hopes to work with the alliance to seek a Clean Water Act Section 319 watershed assistance grant from EPA to help fund a urine diversion and recycling pilot project. The grant money would buy equipment such as urine diverting toilets for a dozen or more volunteer households. “I haven’t come across another approach to nonpoint source management that makes so much sense and is so practical and sustainable,” said Cedarholm, who left his job in Durham in July to join a consulting firm.

During some of the evenings when the Pee Bus was parked close to downtown Durham, Cedarholm and Kinner joined the four seniors in trying to flag down students walking by. Together they learned that the best way to recruit passersby to use the mobile facility was to ask them to engage in a simple but noble act: donate a valuable resource that would otherwise be wasted.
Summer at NEIWPCC meant another successful Lowell (Mass.) Youth and the Environment Program. The program introduces inner-city youth to career opportunities in the water and wastewater fields, and this year, a group of five young people spent seven weeks accumulating skills and work experience at Lowell’s Duck Island Wastewater Treatment Facility. The group rotated through work stations including pretreatment, maintenance, process control, and laboratory; attended training sessions on everything from basic watershed hydrology to professionalism; and went on weekly field trips. Aside from two years when funding cuts put the program on hold, NEIWPCC has coordinated the Lowell YEP every summer since 1990, with help from EPA, the Lowell Regional Wastewater Utility, the City of Lowell, and the Career Center of Lowell.

As seems to happen every year, the YEP participants quickly formed a strong bond with the Lowell plant staff. Captured here during a break on a warm day are (front row, left to right) YEP participants Eileen Baah, Keith Dubreuil, and Christian Roman Rodriguez. Standing (l-to-r) are Tom Kawa, Lowell Regional Wastewater Utility operations manager; Rick Toohey, assistant operations superintendent; YEP participants Danny Ouk and Kevin Ryan; NEIWPCC intern Meghan McNamara, Lowell YEP coordinator; Jin-Bok McGowan, chemist; and Ken Cavanaugh, laboratory technician.

At a graduation ceremony on August 14, the YEP participants delivered a presentation to a group of distinguished guests including Jay Pimpare, EPA Region 1’s regional pretreatment coordinator. One participant, Eileen Baah, enthusiastically reported that she enjoyed observing microorganisms both in the laboratory and during a field trip to pristine Squam Lake in New Hampshire. Baah entered UMass Amherst this September, with plans to major in biochemistry.

In a news release, EPA New England Regional Administrator Curt Spalding wrote, “EPA is very gratified to work so closely for so long with NEIWPCC, the Lowell Regional Wastewater Utility, and the Career Center of Lowell to make this summer job program available for economically disadvantaged youth. This innovative program helps introduce young people to a possible career path that is also a great benefit to their local community.” We couldn’t agree more.

For more information about the Lowell Youth and the Environment Program, contact NEIWPCC’s Don Kennedy at 978-349-2518 or dkennedy@neiwpcc.org.