



Inside Pretreatment Newsletter

January 4, 2009

2009: Get Ready for an Interesting Year

I am looking at 2009 with some excitement and a little trepidation. Whether public or private, it is important that we define our priorities for the next year and longer-term goals. It seems too easy to get caught up in all of the big controversies that are on the news every day and hoping that any change is for the better. Big picture philosophy is great, but in pretreatment, you wake up when that phone call comes in from an industrial user notifying you that they violated their permit. Now, you have to document the call, plan an on-site inspection, figure out the correct informal or formal enforcement response, and decide what documentation you want them to submit. All of the sudden your world view became much more focused. This is where you make a difference.

Something for the volcano hobbyists: Watch is the earthquake “swarm” reported since December 26-27 occurring at Yellowstone Lake – over 500 minor earthquakes have been measured. For those of you interested in the Yellowstone Caldera because of its notoriety as one of the larger super volcanoes in the world, this kind of activity becomes very interesting. Check out: <http://volcanoes.usgs.gov/yvo/> and <http://www.solcomhouse.com/yellowstone.htm> The latter link is a great overall discussion of the Yellowstone caldera and super volcanoes.

Training for Local Governments

Local Limits Training: February 9-11, 2009. [Lakewood, Colorado.](#)

Grease Program Development: February 12-13, 2009. [Lakewood, Colorado.](#) Instructor: Dan Tonello.

Local Limits Training: March 31-April 2, 2009. [Indianapolis, IN.](#)

Local Limits Training: April 28-30, 2009. [Arlington, Texas.](#)

IU Inspectors Training: May 11, 2009. [Cody, Wyoming.](#)

Local Limits Training: June 9-11, 2009. [Portland, Oregon.](#)

Local Limits Training: July 14-16, 2009. [Orlando, FL.](#)

These courses are for POTW Pretreatment staff and managers that work for local programs.

Be sure to go to: www.CWACS.com and click on the Training Courses tab. Workshops are limited to 50 attendees to maximize attendee interaction. This website is updated as registrations are received. On the website, you will find all meeting locations, registration information, registration deadlines, and number of spaces available.

Emerging Pollutants a.k.a. Emerging Contaminants

I was introduced to this area of research and environmental concern several years ago while at EPA. I became part of a group of government and university researchers, private industry, local governments and regulatory agencies that became known as the Consortium for Research and Education on Emerging Contaminants or CREEC (<http://co.water.usgs.gov/CREEC/>). The group is made up of some of the top researchers in the world on these newly emerging chemicals. It is one of the few groups that I have worked with that strives to fully involve everyone and listen to all perspectives. They even allowed me, as an EPA Pretreatment Coordinator, to participate. I was tapped to provide the regulatory nexus to the research that they pursue. My perspective has always been: “If a pollutant is adversely affecting the environment, we must focus our efforts on reducing that pollutant in the environment”. We can all recognize the difficulty in doing that!

We have all seen the stories about these pollutants being present in finished drinking water, suspected in the feminization of fish populations in surface waters, imparting bacterial resistance to antibiotics that are discharged to surface waters, etc. These “emerging pollutants” are found in personal care products, prescription and non-prescription pharmaceuticals, plasticizers, and a multitude of commercially available products. 5,000 or 25,000+ chemical compounds? Natural and synthetic? No one knows.

What are emerging pollutants? From a Clean Water Act perspective (and a personal bias), I think this newsworthy term tends to refer to a chemical or groups of chemicals that: (1) produce a negative effect in the environment; (2) tend to be present at low concentrations; (3) have no well-established environmental criteria or standards; (4) are commonly used or available; (5) are difficult to measure due to the lack of analytical methods or availability of commercial laboratory support; and (6) are not typically regulated by EPA, states or local governments. For pretreatment programs, we will add (7) pollutants are discharged in significant quantities from non-domestic (commercial/industrial) users.

An example where a pollutant was once considered an “*emerging pollutant*” and is becoming a “*regulated pollutant*” is nonylphenol. While there are many metabolites of nonylphenol making the “life cycle” of this compound in the environment an area of on-going research, EPA has developed water quality criteria for this pollutant removing it from the “What do we do?” list of pollutants to one that can be dealt with effectively. In short, the criteria for an emerging pollutant now look like this:

Criteria for an Emerging Pollutant	Nonylphenol: Before 2007	Nonylphenol: After 2005
Produces a negative effect in the environment.	Yes, Toxicity	Yes, Toxicity
Present at low concentrations.	Yes	Yes
Established environmental criteria or standards?	No	Yes. EPA has developed water quality criteria.
Commonly used and discharged to wastewater.	Yes	Yes
Analytical methods availability (commercial laboratory support)	No – Research labs.	Improving
Regulated by EPA, states or local governments	No	Yes. Criteria exist and states are adopting standards (e.g. Colorado). States should look at BMP options rather than only a numeric standard.
Are there commercial and industrial sources?	Yes	Yes (nonylphenol ethoxylates are common surfactants)

Now, for pretreatment programs, a logical next question becomes: Should I develop a numeric local limit for this pollutant or would Best Management Practices be preferred (both are Pretreatment Standards and acceptable). The brevity of this article precludes a discussion of the rationale for the best approach, but the POTW must weigh whether or not it is in compliance with the water quality standard, the presence of non-domestic sources, ability to develop BMPs, and available program resources. These are typical questions that are explored during our Local Limits Training mentioned earlier in this Newsletter.

Research vs. Regulatory

I try to read about some of the latest research (CREEC website has some good references). The current research reminds me of where we were on effluent toxicity in the early 80's: We knew how to use a minnow or water flea as a detector for the thousands of chemicals in an effluent. These toxicity tests were designed to detect lethality and then refined to detect impacts on minnow growth and water flea reproduction (sub-lethal effects). Once toxicity is measured, the pollutant(s) is identified and the source regulated. These Whole Effluent Toxicity (WET) tests are used today and are included in many POTW permits.

Research is moving forward on how to use an organism or a tissue culture as a detector of additional sub-lethal effects, especially on the reproductive and developmental systems of vertebrates. Researchers are looking at the effects of these emerging pollutants in POTW effluents on the test organism (primarily minnows) and are now becoming more interested in sources of these pollutants from users of the sewer system.

An example of controlling an emerging pollutant before it became a regulated pollutant is in the case of the City of Bismarck, ND and nonylphenol ethoxylates. The sewerage treatment plant experienced WET failures and tracked down the suspected chemical and sources. The suspected chemical was nonylphenol ethoxylates used by commercial laundries. With EPA support and using their pretreatment program authority, the City successfully took enforcement and implemented controls (product substitution) on specific commercial users. This work was completed during the time that analytical methods were being developed and prior to the finalization of EPA water quality criteria. A few years earlier, identification of the toxicant may have been impossible. As a note, similar problems were identified previously at a Utah POTW and presented at the CIPCA/EPA Region 8 Conference. The information that had been presented proved useful to the Bismarck Pretreatment staff in forming a hypothesis about the possible pollutant(s) responsible for the WET failures.

What About all the Other Chemicals?

This is the perplexing part of our job. We know that a lot of chemicals are passing through the POTW and being partitioned to the sludge and the sewage sludge is land applied in much of the country. The remaining fraction of the chemical that is not partitioned to the sludge or broken down in the treatment plant's processes is discharged into the surface waters. These surface waters are used for drinking water, irrigation water and as the supporting media for aquatic ecosystems.

What if there are is no criterion or standard and no POTW effluent WET failures or other violations that can be tied back to an "emerging pollutant"? In addition, analytical results for our drinking water indicate the presence of many "emerging pollutants" – you read that in the paper!

Let's suppose that in-stream impacts have been documented and the primary source of pollutants is from the wastewater discharged from the POTW. That is all we have: A known environmental (in-stream) impact, a list of chemicals that were analyzed, no regulatory limits for any of the chemicals, and a lot of political (and ethical) pressure to do something about it. Senior Management wants to know what to do due to the bad publicity. For wastewater and pretreatment staff, the following questions are quickly identified:

- ✓ What can be done to decrease the discharge of these pollutants to a POTW where no specific environmental standards exist?
- ✓ What can be done proactively to control discharges from non-domestic users (medical facilities, manufacturing, etc)?
- ✓ Can we implement an enforceable control or can we only implement a voluntary approach?
- ✓ What if the suspect compounds are from prescription or non-prescription medicines or other personal care products discharged primarily from residences?
- ✓ Is the risk significant enough for us to put this as a priority?

✓ What level of resources am I going to have to identify sources and implement controls?

Realistically, we will find that there has to be National leadership (EPA, FDA) to help POTWs deal with these issues, especially where emerging pollutant problems are due to personal care products and medicines (domestic sources of discharge).

What is the Cost of Being a Society?

Risk should be the controlling criterion for resource allocation when protecting the environment and public health. Without resources and strong leadership, we might as well let the media or special interest groups decide what the priorities are.

What is the acceptable, inherent cost to the environment just by the fact that we as a society must produce and consume food, medicines, electronics, energy, etc. Clearly, everyone knows where that balance is when there is dramatic environmental or human health impact. Even in these cases, doing something to address the source of the problem can meet with resistance and result in a failure of leadership to get something solved (e.g. global warming, mercury, antibiotic resistance, Gulf of Mexico dead zone, etc). Should we, as a society, direct more resources towards the philosophy of “Adapt Globally, Act Locally” where the outcome of addressing global environmental problems is questionable? Another interesting philosophical question.

Even more challenging is the less obvious or less dramatic environmental impacts that we have often associated with emerging pollutants (no dead bodies, melting glaciers, etc). The long-term ecological impact may be severe, but direct impacts on the environment are not as media worthy. Remember, before we had pictures of melting glaciers and permafrost and dying coral reefs, global warming was not well publicized outside of the scientific community.

If we have a list of 1000 chemicals that are in a POTW effluent and are known to cause physiological changes in fish (and maybe humans), which of these chemicals do we need to deal with? Those with the highest physiological activity and at a level where a physiological response is predicted? Do we go down the list one-at-a-time? Do we only address the ones where there is an alternative product available with lower environmental activity? Do we regulate the manufacturing since the end user (home owner) would be impossible to regulate? On the list of 1000 chemicals, where is the line, above which, chemicals must be removed or treated prior to discharge?

Do we implement a regulatory and environmental approach based upon the Precautionary Principle? <http://environmentalcommons.org/precaution-handbook.pdf>

These questions do not have easy answers. The most obvious consideration should be that environmental or organism toxicity evaluation should be built into any new approval for chemicals that will end up in the environment.

I was interested to find out more about emerging contaminants when I started typing this newsletter. I decided to type in www.emergingcontaminants.com I love the web! And what came up? A nanoparticle and nanocomposites company (these guys know!). Yep, pollutants from these nanomaterials will become another area for the researchers and the environment to deal with.

As with everyone else, my opinions change as I learn more. My bias has been with controlling pollutants using the Clean Water Act. What happens when the Act is not sufficient or the chemical is not really viewed as a pollutant? What happens when we discharge chemicals to surface waters that have never been evaluated for environmental toxicity and there are no analytical techniques to measure their presence?

Author's note: The views expressed in this article are my own (I have no other defense for what I have written). Much of the discussion around controlling the discharge of emerging pollutants incorporates philosophy, science, and law. I started writing this newsletter intending to keep philosophy out of the discussion. However, as we are fortunate enough to be able to formulate questions about this subject, I found it impossible to ignore philosophy and sociology. I am confused as anyone else on some of the answers. I tend to be a passionate optimist, frequently forced to face the pessimism of politics.

Interesting News

Report: Control pollution to save crabs

BY BRIAN WITTE • ASSOCIATED PRESS WRITER • DECEMBER 30, 2008

<http://www.delmarvanow.com/apps/pbcs.dll/article?AID=/200812300432/NEWS01/812300324>

Edited for Length: Pollution and overfishing have caused devastating declines in Chesapeake Bay blue crabs, and the federal government has been undercutting state efforts to restore the bay by failing to enforce environmental laws, a conservation group said Monday. The report, titled "Bad Water and the Decline of Blue Crabs in the Chesapeake Bay," cites pollution and overfishing -- particularly of female blue crabs -- as the two causes of the problem. While as many as 791 million blue crabs were estimated to live in the bay in 1990, their numbers plunged to about 260 million at the end of 2007. Among the report's key findings:

Low-oxygen "dead zones" have killed crab food, nitrogen and phosphorous pollution are causing algal blooms that kill underwater grasses needed for crabs to hide from predators, and overfishing has not been controlled.

Benjamin H. Grumbles, the EPA's assistant administrator for water, said science and cooperation between governments and stakeholders are needed to clean up the bay, not fingerpointing and lawsuits like one threatened by Baker's group to force pollution reduction.

"It takes a partnership, and EPA is committed to working with everyone to accelerate progress and hold polluters accountable," Grumbles said in a statement.

While the continued "politics of postponement" of essential conservation steps have harmed the bay,

Baker said proper enforcement of current laws and help from a federal economic stimulus package under consideration could turn things around.

"We think if the Clean Water Act and the Clean Air Act are enforced you could see water quality improvements within five years," Baker said.

THE POST CHRONICLE: SCIENCE

Published: Dec 21, 2008

Report: EPA Allows Chemical Secrecy by Staff

The U.S. Environmental Protection Agency has kept data about potentially dangerous chemicals secret, the Milwaukee Journal Sentinel says.

The newspaper said its analysis of more than 2,000 EPA dangerous chemical filings during the last three years found that the U.S. department allowed chemicals' names to remain undisclosed in more than half those cases. In hundreds of the registered reports, both the company and its address remained confidential.

The Journal Sentinel said the secretive EPA entries appear to be in opposition to a federal law that requires EPA officials to publicly report any new data regarding potentially dangerous chemicals. Under the related EPA regulations, the federal department can only agree to retain confidentiality for a company or product under rare circumstances.

Wendy Wagner, a University of Texas-Austin law professor, said the newspaper's findings appear to indicate the agency has violated Toxic Substances Control Act rules. "The EPA has chosen to ignore that," she told the Journal Sentinel. (c) UPI

Scientific American

<http://www.sciam.com/blog/60-second-science/post.cfm?id=scientists-urge-epa-to-assess-poten-2008-12-18>

Dec 18, 2008

SCIENTISTS URGE EPA TO ASSESS POTENTIAL PHTHALATES RISKS

David Biello

Data from the U.S. Centers for Disease Control and Prevention (CDC) indicates that humans carry phthalates—chemicals used as softeners in plastics and found in everything from pill coatings to nail polish—around in their bodies. A growing number of studies, primarily in rats, show that phthalates cause male reproductive problems—infertility, decreased sperm count, malformation—and can cross the placenta. As a result, the European Union has banned some of them and consumer advocate and environmental groups have called for the U.S. government to do the same.

Today, an advisory panel of scientists, commissioned by the Environmental Protection Agency (EPA), released a report recommending that the chemicals be assessed as a group for potential risks as soon as possible.

"Our committee concluded that there are common adverse outcomes," said Deborah Cory-Slechta, a specialist in environmental medicine at the University of Rochester during a press teleconference. "There should be a cumulative risk assessment and it should be broadened to all phthalates and anti-androgens [chemicals that block or eliminate male hormones]."

There have been only a few, small studies of phthalate levels in pregnant women and the health of their offspring. But toxicologist Paul Foster of the National Institute of Environmental Health Sciences in Raleigh, N.C. said that pregnant humans, rats and all mammals share enough similarities (in gender development in the womb) to suspect that if phthalates produce ill effects in rats they will do the same in humans.

"There is evidence that the levels of phthalates in [human] amniotic fluid are in the range of levels in rat amniotic fluid that gives rise to adverse effects in offspring," toxicologist Andreas Kortenkamp of the University of London said during the call.

Industry groups, including the American Chemistry Council, argue that there is not enough evidence that phthalates cause harm to justify a risk assessment, a charge that the committee dismisses based on the accumulating animal data. Now it's just a matter of when.

"EPA clearly believes it is of interest to move ahead," Cory-Slechta said. "Where it fits within their priorities and timeframe we cannot address but it's certainly on their radar screen."

Newsletters reflect the opinions of CWACS. They are not intended to change what a specific State or EPA may require.

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