RE-EVOLUTION OF THE MCP

Compiled by Lisa Alexander

On March 5, 2012, the press release proclaimed: "GOVERNOR PATRICK ANNOUNCES INITIAL RESULTS OF SWEEPING REGULATORY REFORM INITIATIVE AND NEW STEPS TO STREAMLINE SMALL BUSINESS REGULATIONS." The text of the article begins: "Largest state review in 15 years aims to update regulatory practices with a focus on small businesses; Department of Environmental Protection is early stand-out at striking balance between needs of environment & businesses." (See: http://www.mass.gov/governor/pressoffice/pressreleases/2012/2012305-streamlining-small-business-regulations.html.) And when you are here inside the agency, in some ways, you feel it. Office doors of our primary policy writers are often closed, workgroups meet, drafts are circulated. But there is a calm eye in the hurricane too. It's called: "Day Job." And most of us are still doing that. I first came to BWSC in October 1992, during the re-write of the 1988 Massachusetts Contingency Plan (MCP), creating what was to become the first incarnation of the current MCP, most of us did our jobs un-affected by what was to come. In the last few months leading up to October 1993, a flood of Waivers (mostly petroleum sites) were reviewed as we cleared the proverbial decks for the new program. On April 25, 2012, both Dick Chalpin and Jim Colman received the U.S. Environmental Protection Agency's "Lifetime Achievement Awards" in part for their work on that MCP. (See: http://www.epa.gov/region1/ra/ema/index.html)

Our MassDEP web page is regularly updated by Commissioner Kimmell. The latest update, (http://www.mass.gov/dep/about/priorities/regreform.htm) coincides with the Governor's March 5, 2012 statement, reiterating the agency's commitment to its core responsibilities even in the face of shrinking staff and budgets. (For details, see: Final Action Plan for Regulatory Reform at the Massachusetts Department of Environmental Protection (MassDEP). As noted in the update, "the first phase of regulatory reform included a review of more than 200 regulations" and "identified 41 regulations to eliminate and 107 regulations to improve." The recommended changes cover a wide range of topics and include streamlining licensing requirements, simplifying standards for business practices, and eliminating duplicative reporting requirements. As chaotic as that might sound, it's also exciting. 21e and the MCP are living documents that have matured in more ways than one, and both the regulated – and regulating – communities have views, opinions and insights on that. It seems a lot of stakeholders both inside and outside the agency *welcome* opportunities to update our collective understanding of assessment and remediation of contaminant releases, based on nearly twenty years of practice. Nearly everyone in this field can see areas to clarify and streamline. Given the way the rest of the country continues to be interested in our program, it seems likely they will be following these developments as well. For those who want to follow the progress on proposed revisions, go to http://mcpregreform.wordpress.com/.

One of the most interesting areas where science meets regulation is in the area of Light Non-Aqueous Phase Liquids (LNAPL), especially petroleum, and how to address it when it remains in soils. Ken Marra's LNAPL workgroup, the LSPA's 2005 and 2008 white papers on LNAPL, and the studies by the Interstate Technical and Regulatory Council (ITRC) and other technical

and regulatory organizations in North America have all been instrumental in advancing understanding of the movement (or not) of LNAPL in the subsurface.

The ITRC recently held a two-day LNAPL training at the Park Plaza Hotel in Boston. There were plenty of opportunities for DEP and LSPs to interact in problem-solving capacities and both LSPs and MassDEP staff reported learning new things at the conference.

Meanwhile, although nothing is final yet, we do anticipate that the updated LNAPL Conceptual Site Model (LCSM) will be heavily reflected in the upcoming regulation changes. "Tank and Pancake" is giving way to the "submerged iceberg" or "shark fin vertical profile" model. Revised understanding of oil transport (or not) through various types of soil pore spaces or into monitoring wells or utility conduits under different hydrologic conditions will lead to changed expectations of what is needed for assessment and risk characterization upon discovery of LNAPL, either in monitoring wells or anywhere else in the subsurface. This will lead to more effective ways to assess and remediate these sites, as well as to prevent LNAPL from migrating to sensitive receptors or locations where it's not wanted.

In my own early days in BWSC, there were two very interesting sites I worked on as a project manager during the Waiver push. Both sites had been impacted primarily by petroleum – kerosene, #2 fuel oil and diesel. Although the sites were quite different at first glance (one was an old public works facility, one was a bus yard and garage), they had a number of things in common that made it imperative to understand the LNAPL migration in soil.

First, both had adjacent residences on at least one property boundary. Both had multiple leaking underground storage tanks with less-than-stellar monitoring and detection equipment. Leaks went undetected (or at least not appropriately repaired) for several years before the releases were discovered. Leaking tanks went unreported *until* oil was found up to a half mile away in surface waters. Both sites were located in older cities where storm drains had been constructed with underlying sub-drains that would periodically empty upward into the storm drains via vertical connecting pipes. And finally, while we started with almost no idea how much oil had actually leaked into the subsurface during the life of the underground storage tanks, in both cases, the estimates were high, several *thousands* to several *tens of thousands* of gallons. The estimates were based in part on the prevailing understanding of LNAPL behavior, fluctuating LNAPL thickness detected in multiple monitoring wells (e.g., there were over 60 soil borings converted to monitoring wells on and off the source property), measured contaminant concentrations in soils across the sites and limited (and perhaps sketchy) tank stick test data.

At both sites, there were one or more preferential pathways for oil to move toward nearby roadways. One in particular had multiple buried utilities, a complex steam heating system, sand lenses and buried sandy stream beds. Once oils reached the roadway areas, they were able to enter the sub-drains which effectively acted like long, horizontal "monitoring" wells into which oil could penetrate and collect. During high groundwater events, the oil would flush upward into the primary storm drains through which they were carried out toward the surface waters where the releases were first observed. In both cases, there were a number of potential sources in the area, and it took petroleum fingerprinting to solve the 21e mystery spills.

These were fascinating studies of what subsurface oil will and will not do. A monitoring well near a known source area on one of the sites would occasionally exhibit several feet of product,

but an adjacent groundwater pump and treat system was virtually useless for recovering oil. Split spoon samples and test pits in the area revealed that the bus yard, built on a former wetland (back when that was allowed), had been filled with extremely heterogeneous material – including some areas filled with some sort of ash (nearly impermeable) while other areas were filled with sand, soil, wood, cobblestones and other loosely packed "debris" that probably had a great deal to do with where oil was and was not located. After we learned that one nearby resident had inadvertently tapped into an oil migration pathway during an attempt to install a hand bored irrigation well for a large vegetable garden, we arranged to conducted split spoon sampling in the backyards of several other nearby residences. However, upon sampling, only trace concentrations of oil were found when present at all.

In the public works yard, routine bailing of the various monitoring wells revealed only very slow recharge into just a few affected wells. In both cases, systems were installed at the end of the storm drains to try to capture oil before it entered surface waters. There were no easy remedial strategies at either site, as much as we wanted one. It's likely that, except where excavated, there is still oil at both locations today.

In the years ahead, perhaps we'll exclusively use natural gas-electric hybrid vehicles, or non-toxic sugar cane and algae derived fuels, perhaps not. But in the meantime, greater understanding of LNAPL in soils is a great step in the direction of better assessment, control of risks, and perhaps, ultimately, better remediation. I think that is one area both LSPs and MassDEP agree on.