

Considering RAOs...

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This article provides some reflections on the recent Audit Case Study training, discusses RAO invalidation and highlights two Natural Resource Damage Assessment cases, one in Connecticut and one in Massachusetts.

SLOGGING THROUGH THE SNOW...

On December 9th, we wrapped up the Audit Case Study training for this year at the Northeast Regional Office in the middle of a surprisingly messy snowstorm. Although the snow was pretty through the conference room windows, it made for terrible driving. In the future, if a storm event should coincide with our training, assume it will be canceled if MassDEP offices are officially closed on that morning for all but emergency personnel. In cases where adverse weather is predicted in advance of the training, contact April Turcotte at the LSPA offices at 781/876-6233 to determine whether the training has been postponed.

The Audit Case Study training prompted two questions that are nearly always asked about the subject cases --

- What is its current status? and
- Was the Response Action Outcome (RAO) Invalidated?

What is the current status of the case? The Audit of this plating site prompted additional investigation that revealed hexavalent chromium had reached the river; an Immediate Response Action was initiated in that area. Following adjustments to the groundwater recovery system, the rest of the site is back in compliance and the site remains in Phase V, as the contaminant plume appears to have stabilized.

Was the RAO Invalidated? There has been no RAO for this case yet. The original Audit was of the Comprehensive Response Action with two Status reports on file.

MassDEP has not used an Invalid RAO in the Audits Case Study training in many years, yet there always seems to be great interest in the answer to this question during the training.

WHEN IS AN RAO “INVALID”?

A quick data base query shows that of more than 11,000 RAOs audited and/or screened since the start of the program, fewer than 200 have been deemed “Invalid”. Most of those sites were brought back into compliance – either by performing additional assessment that supported the original Opinion, or by conducting additional assessment

and/or remediation work and/or risk reduction measures. The majority of the LSPs who have had an RAO invalidated have only had one such case.

In the past when the Audit Case Study training has featured sites with invalidated RAOs, the sites were chosen because:

- They were relatively interesting cases;
- MassDEP staff working on the training were familiar with the cases and had involvement with the cases after the RAOs were submitted; and
- Additional assessment after the RAO on yielded a substantially different “conceptual site model” than originally presented, illustrating how relatively few additional data points made a great difference in understanding the site and supporting the response action submittal.

Feedback from participants and the LSPA noted that these cases were often so egregious that they made poor case studies, and that more ambiguous, mainstream, or even “good” cases would be more informative as most LSP work was not as problematic as the cases selected. MassDEP agreed and has not used Invalid RAO cases in many years

An RAO invalidation usually involves more than one violation and a high probability of current exposure risks at a site. Without getting into the specifics of particular cases, below are ten examples of combinations of violations found for individual cases that led to invalidation of the RAOs:

- The RAO did not contain clear indication of site boundaries; the extent of release was not fully delineated; the furthest downgradient well had the highest contaminant concentration; there were multiple problems with execution of two Grants of Environmental Restriction, including that the use of a private well for drinking water was not properly eliminated.
- The nature and extent of contamination was not fully delineated; separate phase product was still present on site up to thicknesses of 0.63 feet following shutdown of the recovery system.
- Class C RAO (filed in 1996) did not have any periodic evaluations of the remedy (a Temporary Solution which relied on an active treatment system that had been shut down in 2001); indoor air samples collected in 2006 detected volatile organic compounds attributable to the disposal site at Imminent Hazard levels in the on-site building.
- Site was located in a GW-1 area with contaminant concentrations at the site exceeding Method 1, GW-1 standards; Exposure Point Concentrations (EPCs) for soil exceeded S-2 and S-3 cleanup standards; there was no AUL but the RAO and risk characterization findings were based on restricted site uses and activities.
- Gasoline-contaminated site where a Class A RAO was submitted without elimination or control of sources; nature and extent of the oil and hazardous material in all evaluated media was not defined; a condition of No Significant Risk was not supported; conservative Exposure Point Concentrations were not identified.

- RAO was not supported by existing assessments; Risk Characterization did not include the vertical and horizontal extent of the oil and hazardous materials in all evaluated media; Exposure Point Concentrations were not clearly documented; Method 1 Risk Characterization did not compare Method 1 cleanup standards to EPCs; Risk Characterization did not evaluate the portion of the site within an area designated as part of a National Heritage Endangered Species Program as Rare Habitat; RAO boundaries were not delineated; several violations of Activity and Use Limitation documentation.
- Not all source areas for the release(s) were identified/discussed but sampling results suggest more than one source area (site now developed for residential use); extent of release unknown; contradictory groundwater flow information; groundwater contaminant concentrations below residential buildings not sampled; pre- and post-“treatment” sampling of groundwater showed *increasing* concentrations (from 34,000 to 62,000 µg/L PCE); vapor barrier and subslab ventilation system installed to mitigate vapor intrusion at one residence (with only one round of indoor air sampling) and other nearby residences within the area of the groundwater contamination were not evaluated.
- Failure to document that a Critical Exposure Pathway was mitigated or eliminated to the extent possible with air filtration units at one adjacent residence (elevated petroleum vapors remained in indoor air at the residence despite operation of filters); failure to define the extent of the contaminant plume in groundwater and soil vapor; indoor air at a second additional residence was not evaluated despite GW-2 exceedences and elevated soil vapor contamination between the site and that residence.
- AUL audit determined that the terms of an AUL were not being maintained; several problems with the AUL instrument.
- Previous Notice of Audit Findings/Notice of Noncompliance had been issued with several requirements outlined to demonstrate that a condition of No Significant Risk had been achieved and errors in the AUL had been corrected – the PRP failed to respond; the RAO was based on sampling with analytical detection limits exceeding applicable Method 1 cleanup standards; failure to delineate the boundaries of the site; insufficient information to demonstrate that groundwater EPCs were below the relevant clean up standards.

As previously stated, it is not just one violation that causes MassDEP to invalidate an RAO. Sometimes, MassDEP outlines specific requirements to support an RAO at the end of an Audit, but when the requirements are not met, the RAO may be invalidated later. Invalidated RAOs often have several serious violations and often there are indications of significant risk either to human health, or particularly sensitive environmental receptors.

At the December training, Duff Collins reminded participants about the LSPA’s Peer Review Program which is available to all LSPs as a “second pair of eyes” to review a submittal (see the November 2009 LSPA newsletter for more information and one LSP’s experience with the program).

RECENT NATURAL RESOURCE DAMAGE ASSESSMENTS (NRD)

Old Southington Landfill, CT - Superfund Site

Background:

This former twelve-acre municipal landfill was operational circa 1920 to 1967, with different sections used for disposal of municipal, commercial and industrial waste, and wood and construction debris. From 1973 to 1980, after the landfill was closed by the Town and covered with soil to a depth of two feet, the landfill property was subdivided and developed into residential, commercial, and industrial properties. EPA placed the site on the National Priorities List (aka Superfund list) in September 1984.

In 1994, EPA issued the first Record of Decision (ROD) requiring relocation of residences and businesses that had been built on the landfill, plus construction of a landfill cap incorporating a soil gas collection system. The ROD also required further assessment of groundwater impacts.

Damage Settlement:

Two settlement consent decrees, formalized on November 23, 2009, call for cleanup work to proceed, and establish funding responsibilities among several PRPs to help finance the cleanup remedy.

Five PRPs identified as contributing the largest volume of waste will pay:

- \$500,000 to cover EPA's future oversight costs;
- \$537,000 to the U.S. Department of the Interior for federal NRD; and
- \$2,750,000 to the State of Connecticut for state NRD.

One decree requires the five primary parties to complete the cleanup remedy, including:

- Establishing environmental land use restrictions on properties or portions of properties where groundwater contamination concentrations exceed State of Connecticut Remediation Standard Regulations;
- Building ventilation systems, sub-slab depressurization systems, or similar technology, in buildings located over properties or portions of properties where groundwater contamination exceeds the State criteria;
- Conducting groundwater monitoring in areas where the potential for vapor intrusion is a concern;
- Performing operation and maintenance and monitoring of engineering and institutional controls to ensure remedial measures are performing as intended and continue to protect human health and the environment in the long-term; and
- Conducting five-year reviews to ensure that health protection measures continue to be effective.

The second decree provides for 86 other PRPs to collectively pay \$4,248,450, to be deposited into a trust account, managed by the five primary PRPs. A portion of the

money will be used to finance the State and Federal NRD, with the rest providing financial assurance for the remedy.

The full article can be viewed at: www.epa.gov/region1/superfund/sites/oldsouthington.

Sutton Brook Landfill Tewksbury, MA - Superfund Site

Background:

The Sutton Brook Superfund Site (formerly “Rocco’s Landfill”) is a 40-acre landfill comprised of two large lobes and areas of contaminated soil. Sutton Brook flows between the two lobes. Municipal, commercial, and industrial wastes were disposed there from at least 1957 through approximately 1988.

Investigations conducted by MassDEP and EPA, beginning in the 1980s, revealed various contaminants, primarily volatile organic compounds and semi-volatile organic compounds in groundwater, surface water, soil and sediments. EPA placed the site on the National Priorities List (“Superfund”) in 2001.

Recent Settlement with 49 Parties:

On December 22, 2009, the Massachusetts Attorney General’s Office, the Executive Office of Energy and Environmental Affairs (EEA), the EPA, MassDEP, the US Fish & Wildlife Service (USFWS) and the U.S. Department of Justice (DOJ) reached a settlement with 49 parties to both cleanup the Site and compensate for NRD for injury to groundwater and wetlands at the site.

The monetary portion of the settlement includes:

- \$512,000 to reimburse MassDEP’s past response costs and an obligation to pay for MassDEP’s and EPA’s future oversight costs; and
- \$1,650,000 in Natural Resource Damages (NRD) to the EEA and USFWS, as the state and federal Trustees, to restore injured resources to their baseline condition, compensate for the interim loss of resources, and reimburse the cost of conducting the damage assessments.

The settlement also requires:

- 20 of 49 responsible parties to primarily finance and perform the remedy selected in the 2007 ROD (expected cost approximately \$30 million);
- Excavation and consolidation of contaminated soil and sediment;
- Installation of caps at the two landfill lobes and a vertical barrier for groundwater diversion;
- Implementation of natural attenuation and active treatment of contaminated groundwater, plus institutional controls and monitoring; and
- Contribution by the other 29 responsible parties as cash payments toward the cost of financing the remedy and for other purposes.

One novel aspect of the settlement includes reduction of greenhouse gas emissions associated with the construction and operation of the remedy, based on an evaluation of potential cost savings (to be determined).

The full story can be found on the Attorney General's website at: www.mass.gov/ago.