THINK

TANK

Published by the Underground Storage Tank Branch
as a service to the regulated community in Delaware

Winter 2000–2001 Number 32

FIRST Fund Orphan Tank $$$$$$ Now Available

by Suzanne Halter

The Department of Natural Resources and Environmental Control along with the LUST Committee developed the FIRST (Fund for the Inability to Rehabilitate Storage Tank sites) Fund policy to address UST sites that are abandoned or "orphaned."

The program was adopted in March 2000 and will pay to investigate and remediate sites where there is no known owner or the current owner is unable to pay for UST work. Commercial or industrial properties with "orphan" USTs represent the largest source of potential FIRST Fund sites. In addition, residential sites are also eligible for this program.

If you have or know of a site with an orphaned or abandoned UST, please contact the UST Branch so that the site's eligibility can be determined. The UST Branch has identified 36 sites to date that may be cleaned up under FIRST Fund.

To qualify for FIRST Fund, an UST site must meet one of the following criteria:

- UST owner is unknown, despite reasonable efforts to identify the owner, as determined by the UST Branch, or
- UST owner is known but financially unable to pay as determined by the results of a financial analysis.

The UST Branch will use FIRST Fund money for the following activities:

- Remove or abandon USTs containing products regulated under 7 Del. C., Chapter 74;
- Investigate and assess contaminated UST sites;
- Remediate soil and water contamination as a result of a release from an UST system;
- Restore or replace potable water supplies;
- Respond to emergencies and mitigate initial site hazards at UST sites.

The end result of this program will be to return underutilized UST sites to productive use. The UST Branch expects to work with community-based agencies and local governments to identify eligible sites. For information regarding the FIRST Fund please contact the UST Branch at (302) 395-2500.■

Public Workshop

Tanks 2001... and Beyond

March 7, 2001, the UST Branch will host a public workshop for tank owners, operators, contractors and consultants. Please mark your calendar now for this event.

The full day workshop will take place at the Lukens Drive office and feature informative updates and interactive workshops by UST Branch staff and selected vendors, consultants, contractors and laboratories.

Topics will include tank management workshops, remediation technologies, financial responsibility, state loan programs and more.

More detailed information will be mailed as soon as it is available.■

DERBCAP Technical Issues Forum

by Emil Onuschak Jr.

What are the relationships in DERBCAP between the Point of Compliance, the Point of Exposure and the property line?

By now, consultants, contractors and Responsible Parties working with underground storage tanks in Delaware are familiar with the basics of the Delaware Risk-Based Corrective Action Program, or DERBCAP. DERBCAP is a scientifically sound way to quantitatively assess the potential risks originating from a leaking underground storage tank.

The starting point—Tier 0—is the familiar "two soils samples per tank to be removed" and a short list of analytes. (If an underground storage tank is to be abandoned in place, then either four or eight soils samples are required.)

But if contaminant concentrations exceed Tier 0 thresholds, and overexcavation is not an option for whatever reason, then a site must be reassessed under the DERBCAP Tier 1 procedure.

It is in Tier 1 where we first encounter the terms Point of Compliance (POC) and Point of Exposure (POE) and a consideration of how the property line enters into the risk assessment of the site.

If a release from a leaking underground storage tank impacts the ground water and begins to move, we first look for Points of Exposure. A common POE—though not the only one— is any water-supply well in the downgradient direction. This is a place where the contaminants from the leaking underground storage tank may come into contact with receptors, such as persons drinking the well water.

Assuming the POE has not been impacted by the release, then a Point of Compliance monitoring well is established as an "early warning" mechanism. (If a POE water-supply well has been impacted, then risk assessment is not applicable. An impacted water-supply well must be either replaced or remediated.) A POC monitoring well is meant to:

- Provide a positive indication of any contaminants moving toward the POE *before* the receptors are exposed.
- Provide a positive indication whether or not contaminants are moving off-site.

If the source of a release, a POE and a POC are all on the same property, then the distance-based Risk-Based Screening Levels (RBSLs) that are pre-calculated for a DERBCAP Tier 1 assessment can be used directly. A table of pre-calculated RBSLs appears as Table 4 in the DERBCAP Guide (Delaware Risk-Based Corrective Action Program, 1999, Delaware Document No. 40-09/99/10/01).

If, as is more often the case, the POE is on another, nearby property, then a POC is placed at the downgradient property line of the site containing the release. The rationale is to keep the core of the release on the property where it originated. As long as the POC at the downgradient property line is not impacted, then the release is contained on-site and the pre-calculated RBSL shown in Table 4 for the *source-to-POE* distance may be used to assess the contaminant concentrations at the source. Remediation or monitoring is the possible course of action.

However, if the POC at the downgradient property line is impacted, however slightly—or becomes impacted during a monitoring period—then the source must be reassessed using a lower RBSL determined by the *source-to-POC* distance. This more stringent assessment standard works to minimize the amount of contamination that migrates off-site.

When a POC well is installed, it may be found that a contaminant plume has already crossed the downgradient property line. If there is *no* POE within 500 feet of the downgradient property line, then the applicable RBSL is determined by the distance from the source of the release to the POC. This works to eliminate the source so the portion of the plume that has migrated off-site can attenuate naturally and is not renewed.

Finally, if the POC well is installed and it is found that a contaminant plume has already crossed the downgradient property line *and a POE is located within 500 feet*, then a sentinel well must be installed between the leading edge of the plume and the POE. As long as the sentinel well is not impacted, the distance to the POE determines the applicable RBSL. If the sentinel well *is* impacted, then the distance from the property line to the sentinel well or the sentinel well to the POE, whichever is less, determines the RBSL.

Various scenarios describing the relationship between the Point of Compliance, the Point of Exposure and the property line are illustrated in the DERBCAP Guide found on the Underground Storage Tank Branch's Web page at http://sirb.awm.dnrec.state.de.us/deusthom.htm (click on "Technical Guidance," then on "DERBCAP"). ■

MtBE: Time is Money

by Tripp Fischer

By now, most of us are familiar with the fuel additive MtBE and its chemical properties. In comparison to the other chemicals of concern (COCs) in gasoline, MtBE is more soluble in water (4,300 ppm), does not like to sorb to soil particles, has low taste and odor thresholds, and infrequently degrades in aerobic conditions.

As a result, MtBE plumes tend to move faster, longer, and deeper than other gasoline constituents in ground water. Therefore, delaying free-product recovery and/or remediation at Leaking Underground Storage Tank (LUST) sites could cost owners thousands of dollars in the long run. To best exemplify this concept here are two "real-life" scenarios located in our home state of Delaware.

Case 1 (Kent County)

The failure of a product pipeline running adjacent to a dispenser-island for a 10,000-gallon gasoline UST resulted in a gasoline release of about 100 gallons. A hydrogeologic investigation was conducted and concentrations of all analytes (BTEX, GRO) were below action levels. MtBE was not a chemical of concern (COC) at that time and was therefore not included in the investigation.

Nearly 16 months later, a resident nearly 300 feet down-gradient of the gas station reported a strange odor in his water which is supplied by a shallow private well screened in an unconfined aquifer. The well contained 13 parts per million (ppm) MtBE and a sample collected nearly a month later contained 24 ppm. A subsurface investigation resulted in a BTEX plume that was confined to the station property and a MtBE plume that extended nearly 1,300 feet down-gradient causing a direct impact to six private wells. All impacted wells were immediately treated with carbon filters and later replaced by deeper wells screened in confined aquifers. Assuming the gasoline mixture was 10 percent MtBE, nearly 10 gallons of MtBE were likely to have been released as a result the leak. Remediation to reduce the "core" of the plume is underway.

Case 2 (New Castle County)

At least 15,000 gallons of gasoline were released to the sub-surface as a result of a faulty flexible connector in the UST system. Inventory discrepancies were not reported to the UST Department during the estimated seven-month leak. Assuming the composition of the gasoline mixture contained 10 percent MtBE, nearly 1,500 gallons of MtBE could be involved in a developing contaminant plume. If nearly 10 gallons of MtBE caused a 1,300 foot plume in 16 months, imagine what 1,500 gallons could produce.

Of course, plume length is not only a result of the magnitude of the contaminant source, but also various site-specific geologic and hydrogeologic characteristics as well. An initial water sample collected 150 feet down-gradient from the UST contained 14 ppm MtBE. Free product recovery continues to date and extensive plume delineation is underway.

Discussion

The fate and transport characteristics of MtBE allow for longer, deeper and faster moving contaminant plumes at LUST sites. Effective leak detection methods/techniques as well as rapid product recovery will greatly reduce or eliminate the extent and duration of MtBE plumes.

Reducing the extent and duration of MtBE plumes could also reduce the cost of remediation and characterization by tens of thousands of dollars. In the first case, a lack of awareness of MtBE as a COC shows how a relatively small quantity of MtBE can produce a substantial contaminant plume. In the second case, conducting proper inventory control could have avoided not only an enormous release, but could have shortened the amount of time the MtBE has traveled in the sub-surface.

Off-site impacts in the first case have been significant and costly while the extent of off-site contamination in the second case is likely but currently unknown.■

UST Web Site Addition

by Barbara McGuigan

The UST Branch has just completed the UST-ArcIMS Information Management System. What does that mean exactly? It means that you can go on-line and find UST sites in and around a particular address.

How does UST-ArcIMS differ from the DNREC's Environmental System? The user-friendly program has the newest internet mapping technology which provides informational server pages.

In other words, you not only have the option to look at a recent satellite or map image, but it also produces informative UST reports with a click of the button. It will be available in December from our homepage: http://sirb.awm.dnrec.state.de.us/deusthom.htm

See for yourself! Stop in and tell us what you think by signing our Guestbook. We look forward to your comments.■

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Printed on Recycled Paper

Announcements

Jennifer (Schriber) Roushey – came to the UST Branch on September 1 as a Hydrologist. Jennifer is a January 2000 graduate of the University of Delaware where she majored in Environmental Science. During her senior year at the U of D, Jennifer did a six-month internship with the DNREC SIRB Branch. She was previously employed by an environmental consulting firm in PA. On November 25, she married Jeffrey Roushey of New Castle. After a honeymoon in Mexico, the couple now reside in north Wilmington.

Brian Churchill – Environmental Scientist, was married to Jaime Sullivan of Newark October 7, 2000. Jaime, an analyst with MBNA, and Brian honeymooned in Aruba. The couple live in Newark.

Pat Ellis – presented two papers: *Historical, Legislative, and Regulatory Overview of the Use of MTBE*, at the annual meeting of the Association of State and Territorial Solid Waste Management Officials, Washington, DC, October 16th and *MTBE Behavior in the Subsurface: Diving Plumes*, at the National Ground Water Association Focus Conference on Eastern Regional Ground Water Issues, Newburgh, NY, October 4th.

Tripp Fischer – presented a paper, coauthored with Pat Ellis, at the 16th annual Contaminated Soils Conference in Amherst, MA. The paper and talk was entitled, *Small State, Big Plume, Big Problem; MTBE in Delaware's Risk-Based Corrective Action Program*.

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Doc. #40-09/00/11/01

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