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Mates



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UNDERGROUND STORAGE TANKS

Underground storage tanks (USTs) are used to store petroleum products and other liquid chemicals where they will be easily accessible, secure from vandalism, and risks of fire are minimal. Unfortunately, since they are underground, it's difficult to determine if a tank system is in good condition. Corrosion may have compromised a steel tank, welds and seams may not be tight, a fiberglass tank may have cracked, piping joints and elbows may not be secure, and dozens of other problems may have caused a leak of the contained product into the surrounding environment. These leaks are difficult to detect. They waste the product being stored, are expensive to repair, are very expensive to clean up when they contaminate soil and ground water, and are extremely dangerous from a fire and explosion standpoint. Liabilities from improper management of USTs are formidable.

As of September 1991, there are 45,900 registered active USTs in Michigan. Further, there are 13,000 registered USTs that have been closed in place and 20,700 other registered tanks are permanently out of use, in addition to the active tanks. Since 1986, 22,300 registered tanks have been excavated. There is no way of accurately estimating the number of tanks that are unregistered. As many as 25 percent of all USTs may now be leaking. The odds that a tank will be a leaker go up significantly after it is 10 years old.

Risks

Leaking USTs pose several types of hazards. Vapors or raw product get into sewers or basements and become immediate fire and explosion hazards. It doesn't take a formal risk assessment to understand the danger and liability associated with an explosion.

If a leaking tank contaminates ground water, then nearby drinking water supplies can become contaminated. Such contamination can cause effects that range from unpleasant odors or foul tasting water to chronic health risks such as kidney and liver disease or cancer. Chronic health problems can occur after long-term exposure to a contaminant. Just as long-term exposure to nicotine from cigarettes can cause lung cancer, long-term exposure to water contaminated with a few parts per billion of benzene, a component of gasoline, can cause leukemia. 'Long-term' is considered to be about 10 years or longer, and a part per billion can be compared to putting two drops of gasoline from a medicine dropper into an olympic sized swimming pool.

The concept of risk does not mean that an adverse effect will occur. It is possible that a leak will never adversely affect anything. The legal question, however, is not only what has been affected, but also what may be affected, next week, next year, next decade and beyond. Further, liabilities of UST ownership do not necessarily end when ownership changes.

Legal Responsibility

The State of Michigan has four statutes concerning USTs. The Fire Prevention Code regulates the storage of flammable liquids, and the Underground Storage Tank Regulatory Act requires that USTs be registered, and a \$100 registration fee paid. Both of these statutes are administered by the State Police Fire Marshal Division (SPFM). The Leaking

Underground Storage Tank Act is administered by the Department of Natural Resources (DNR) and directs that when a leak or release from a UST system is discovered, the extent of the problem must be assessed and a cleanup performed. Finally, the Michigan Underground Storage Tank Financial Assurance Act, administered by the Department of Management and Budget, provides funding for investigation and cleanup of leaking UST sites where the tanks have been properly registered and are in compliance with all of the UST statutes. The funding source is a 7/8-cent/gallon portion of the tax on motor vehicle fuel sold in Michigan.

The United States Environmental Protection Agency (EPA) regulates USTs and mandates that each State have a UST regulatory program as strict or stricter than the Federal program. The EPA has established a schedule of upgrading USTs to specifications intended to prevent and detect leaks. Leak prevention includes either cathodically protecting steel tanks and piping to prevent corrosion, or using fiberglass tanks and coatings. All existing tanks are to be upgraded to proper leak protection by December of 1998. Tanks installed after December 1988 are required to have proper leak detection when the tanks are installed. Leak detection includes tank monitoring techniques such as petroleum vapor monitoring, ground water monitoring, automatic tank liquid gaging, and other monitoring methods, or monthly inventory control and annual tank tightness testing. Leak detection must be added to existing tanks that were installed between 1970 and 1974 by December 1991; to tanks installed between 1975 and 1979 by December of 1992; to tanks installed between 1980 and 1988 by December 1993. According to the schedule mandated by the EPA, tanks older than 1970 should already have this protection and tanks installed after December 1988 are to have this protection at the time of installation. Though existing tanks can be upgraded to these specifications, it generally is less expensive to remove the outdated tank system and install a new UST system with proper leak prevention and detection, and overflow protection.

Confirmed Release

If there has been a 'confirmed release' from a UST system, specific response actions must be performed which include a series of reports that must be filed with the SPFM and the DNR. Within 24 hours, the owner or operator must report the confirmed release to the SPFM and take whatever steps necessary to prevent further release to the environment and abate any fire and explosion hazard. Within 20 days of the confirmed release, a report describing what initial abatement measures were taken to clean up the leak or prevent further spread of contaminants to the environment must be submitted to the DNR. If contamination remains after the initial abatement measures are completed, a work plan must be submitted to the DNR that describes the steps to be taken to investigate the extent of the problem, what resources have been or potentially will be affected, and to determine what remedial action may be required. The work plan is due 45 days after the date of confirmed release.

The DNR then has 45 days to review the work plan and either approve it or recommend changes. Once the work plan is approved and carried out, information gathered is compiled in another report to be submitted to the DNR. This report may recommend further investigation needs, or it may identify cleanup options. Once the vertical and horizontal extent of soil and ground water contamination

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has been adequately defined by the investigation work, a Corrective Action Plan has to be submitted for approval by the DNR. The goal of a Corrective Action Plan is to clean up a site of contamination to DNR standards.

MUSTFA

The Michigan Underground Storage Tank Financial Assurance Act (MUSTFA), as stated above, provides funding for investigation and cleanup of leaking UST sites. The intent of this law is to provide owners and operators of USTs a means of meeting EPA financial responsibility requirements. MDOT is eligible to receive MUSTFA funds for leaking UST systems. To qualify for MUSTFA, an owner or operator of a UST must have a properly registered tank, be in compliance with all record keeping and reporting requirements of the UST statutes, and demonstrate that they possess \$10,000 worth of financial responsibility. To receive reimbursement from the fund, one must document that they have paid \$10,000 towards investigation and cleanup of the leaking UST. Investigation and cleanup costs up to \$1 million can be reimbursed from the fund to the owner or operator.

Processing claims against MUSTFA can take from two to several months, depending on the compliance status with the UST statutes and the documentation of costs incurred. The DNR and the SPFM review the documentation for sites where claims have been submitted. An independent firm has been contracted by the State Department of Management and Budget to receive and review documentation of cleanup costs incurred, and determine eligibility for reimbursement. Currently, they are deluged with claims and are trying to increase their capacity for reviewing them. An appeal process is in place if a claim is rejected. Going through an appeal can add several months to the reimbursement process.

MDOT Liability

MDOT owns and operates underground storage tanks at facilities such as maintenance garages and District offices. These facilities have been operating USTs for many years and many of the tanks are in need of upgrading to current specifications of leak prevention and detection. In addition to these facility tanks, MDOT becomes the owner of many USTs when acquiring right-of-way for building or upgrading transportation facilities. The condition of these USTs is either unknown, or difficult to ascertain. The presence of a UST may be obvious if it is marked by something such as vent pipes or a pump island, or it may be common know-

ledge that the site was once a gasoline station. However, USTs are often discovered when excavating for construction. Nothing is known about these tanks until they are uncovered and inspected. It is extremely important from health and safety, budget, and legal standpoints that underground storage tank statutes be understood and complied with.

The most effective way to limit liabilities associated with USTs is to not own them in the first place. Many municipal organizations, from village departments of public works to State of Michigan transportation garages, are using 24-hour service stations for fuel needs, rather than maintaining their own tanks. Tank removal and disposal costs for a 10,000 gallon fuel tank start at around \$3,000. Any problems with leaks will dramatically increase costs because of cleanup and disposal of contaminated soil. Investigation and treatment of ground water contamination, especially if water supplies are affected, can increase costs into the hundreds of thousands of dollars.

Before a tank is excavated, it is critical that it be registered with the SPFM so that the site remains eligible for MUSTFA funding. A tank cannot be registered after it has been taken out of the ground. An unregistered tank that has caused an environmental problem is not eligible for MUSTFA funding. The SPFM normally needs to be notified at least 30 days prior to a tank excavation. However, when tanks are discovered during construction, MDOT has been given an exemption from the 30-day notification if it means shutting down a project.

Geoenvironmental Services Unit

The Geoenvironmental Services Unit of the Materials and Technology Division has the necessary forms and can answer questions about registering tanks or on notifying the SPFM and DNR of tank-related activities. This Unit is set up to write contracts and retain contractors for conducting tank excavations at MDOT sites, write the reports and work plans, and submit them within their statutory time frame. The Unit also has been working with Real Estate and Construction Division personnel to develop procedures to keep the Department in compliance with UST regulations when tanks are acquired through property acquisition or are discovered on our rights-of-way. Once again, it is critical that MDOT stay in compliance with State and Federal UST laws. Contact the Geoenvironmental Services Unit for assistance or additional information [(517) 322-5698].

-Jim Woodruff

TECHADVISORIES

The brief information items that follow here are intended to aid MDOT technologists by advising or clarifying, for them, current technical developments, changes or other activities that may affect their technical duties or responsibilities.

PERSONNEL NOTES

Because of the length of some of the recent articles, it has not been possible to include our personnel notes in a timely manner. Two long-time M&T members, **Don Meyers** and **Gib Foster** have retired. Don was part of the 'Crystal Falls Gang' who invaded the old Testing Laboratory in Ann Arbor, arriving there in 1956. He eventually became Office Manager for the Lab, and was indispensable in tending to the day-to-day operations. When the Lab moved to the Secondary Complex Don joined the office management staff for the Division. He retired in June after 35 years of service. Gib came on board in 1958 as a Geologist Trainee in the Ann Arbor Testing Lab. After the move to Lansing, Gib became the geologist for the District Support Section, from which he retired in October. Don and Gib were both helpful, friendly coworkers, and we wish them both all the best in their retirement...**Chuck Arnold**, who joined the Research Lab as a student assistant in 1955, has been transferred

to the Design Division, where he becomes Assistant Design Engineer. Chuck worked his way up through the Physical Research Unit to become its head, was head of the Research Laboratory Section, and finally Assistant Engineer of Materials and Technology. A long-time colleague and friend, we know he'll be an asset to the Design Division, as he was here, and we wish him well...**Paul Libutaque** returned to the Design Division in July, after having worked for our Geotechnical Services Unit for 5 years. Paul's contributions to the Division are greatly appreciated, and his cheerful presence will be missed. We are pleased to welcome his replacement, **Dan Troia**, who has been with us previously in the EDP program... Two other new members are to be welcomed to the Division, both in the Research Laboratory's Pavement Technology Unit. **Marie Wilson**, Technician, and **Henry Quiroga** as an Engineer. Our best wishes to Don and Gib in their retirements, Paul and Chuck in their new areas of work, and we welcome Dan, Marie and Henry, and look forward to working with them.

This document is disseminated as an element of MDOT's technical transfer program. It is intended primarily as a means for timely transfer of technical information to those MDOT technologists engaged in transportation design, construction, maintenance, operation, and program development. Suggestions or questions from district or central office technologists concerning MATES subjects are invited and should be directed to M&T's Technology Transfer Unit.

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