New England Interstate Water Pollution Control Commission

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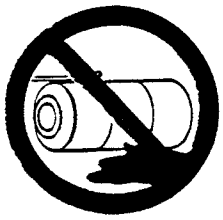
L.U.S.T.LINE



A Report On Federal & State Programs To Control Leaking Underground Storage Tanks

The 'Force' Behind OUST

It may be that, not only Luke Skywalker, but the EPA Office of Underground Storage Tanks (OUST) has the 'force' with it . . . in fact, the 'force' may be breathing down the Agency's neck. UST's seem to be a hot issue and many States, counties, communities, and tank owners have either already taken some kind of positive action or are waiting, like sprinters poised for the pistol crack, for EPA to come forth with guidance or regulations.

The force behind OUST is not just a Congressional mandate (under subtitle I of the Solid and Hazardous Waste Amendments to RCRA) to promulgate UST regulations by May of 1987; it is also those States, counties, and municipalities that have already initiated tank regulatory programs and those others who want to. It is the major oil companies who took on tank replacement programs even before the RCRA Amendments were passed. It is the liability insurance to cover cleanup costs that is very difficult to get. Indeed, the time to deal with leaking UST's has come. The force is here Obi-Wan Kenobi!

Ron Brand, Director of OUST, says if EPA didn't exist, the problem of UST's would still have to be addressed. The leaks would still be there and so would the need for corrective action and a solution for financial responsibility. Brand points out that existing systems with widely varying approaches for dealing with UST's are already out there through State, county and local governments. They have been dealing with leaking tanks all along in some form or fashion and if EPA went away they would still be dealing with them.

So who needs EPA, you ask? Well, although the momentum for doing something about UST's is there, the energy is either flying off in different directions or switched off for the moment until some direction is provided. According to Brand, "EPA's job is to set up a framework for consistency. People need some simple basic tools to get started, and we are in the process of trying to find out what the customer needs."

A Franchise Approach

"We are taking the approach that EPA is in the role of a franchisor," Brand explains. "The State and local agencies are like the franchisees. Excellent franchisors, like Service Master, McDonalds, or Marriott, recognize that their job is to support and enable the field (i.e. franchisees) to perform better. They know genuine success or profits can only occur in the franchises across the country. The franchisors also adopt the approach that their job is to constantly improve the performance of the weakest stores or districts.

"Franchisors also provide research on practical common problems or tasks, and disseminate the results for all to use. EPA's handbook on Notification Implementation and the Software Program for proces-

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Secondary Containment . . . Required in 4 States

California, New York, New Hampshire, and Kansas now have UST regulations which include requirements for secondary containment for new underground storage tank installations. California law allows the exemption of retail motor vehicle fuel tank systems from the secondary containment requirements, if a leak detection and interception system is installed instead. Numerous counties and communities across the country have adopted their own UST regulations, and many require secondary containment of new tank systems. EPA is evaluating the need for and feasibility of secondary containment of new tank systems as a national requirement.

Many major environmental leak incidents have apparently resulted from releases which went undetected for long periods of time. Secondary containment is intended to intercept any leak, and foster its quick detection and remediation to preclude environmental degradation that might, otherwise, result from failure of the primary storage system. A second barrier around the storage tank also provides a second line of defense to (at least temporarily) prevent loss of product to the surrounding environment. A key ingredient in any secondary containment design is the capability and practice of leak monitoring in between the primary and secondary containment barriers to assure any product accumulating within the barrier is quickly detected.

Many types of secondary containment are available today, including double-walled tanks and pipes, flexible membrane liners, concrete vaults, and natural barriers (e.g. clay soil). Other control technologies are available. Some regulations specify which kinds of containment are acceptable.

Although secondary containment entails some additional cost, it may be particularly necessary in certain critical and hydrogeologically sensitive water supply areas. Many State and local governments have already decided that secondary containment with interstitial monitoring is not too high a price to pay to safeguard the future use of important public water supplies.

The **Suffolk County** Department of Health Services on **Long Island**, New York has regulated UST's through its Sanitary Code since January 1980. Long Island has been designated a sole source aquifer and its entire water supply is derived from the precipitation which falls on the island and soaks into the porous, sandy soil aquifer that lies beneath the surface of the land. The Suffolk County Sanitary Code at one time required all new tank installations to have secondary containment for toxic and hazardous storage, except that petroleum tank systems in some locations were exempted. Now, through the new State law and recent revisions to the County Code, petroleum tanks are also required to have secondary containment. Significanty, no new facilities with hazardous waste materials are allowed to locate in the island's delineated recharge zone, and existing facilities may not expand their storage capacity in those areas.

New York State's recently adopted UST regulations state that a barrier must be installed under each (new) tank system to hold any leaks long enough to be detected by the leak monitoring system. In permeable soils, a cut-off barrier of clay or synthetic material may be used. When tanks are installed in permeable soils, the native soil is considered an effective barrier and no additional secondary containment is required.

In other States, secondary containment is required in specific sensitive areas, either by State, local or county regulation. For example, **Massachusetts** regulations, effective February 1, 1986, require secondary containment for all new or replacement installations above EPA-designated sole source aquifers (e.g. Cape Cod and Nantucket). Fourteen out of the fifteen Cape Cod towns had already regulated UST's prior to these revised State regulations.

Texas does not have UST enabling legislation or regulations yet, however, the Texas Water Commission has the authority, under special enabling legislation, to regulate "static hydrocarbons and hazardous substance storage facilities" located on the Edwards Aquifer Recharge Zone. The Edwards Aquifer "system" is a complex geologic and hydrologic unit which encompasses 7 counties, including the cities of Austin and San Antonio, and is the water supply for over one million people. The Zone's UST regulations say that the regulated facilities shall be of double-walled construction or of an approved equivalent method. Interstitial leak detection devices must be included.

A few **Florida** counties with sole source aquifers have UST regulations with secondary containment provisions. Dade County requires secondary containment at locations that are within the "zone of influence" of drinking water wells. **New Jersey** and **Vermont** intend to have secondary containment requirements in their proposed regulations. Vermont will reportedly propose that all new tanks and piping be double-walled (or alternative approved method) unless it can be demonstrated that less protection would not affect public health. At the very least, the State plans to require secondary containment for tanks located in the more sensitive Class 2 (public water supply) Groundwater Classification areas.

The American Petroleum Institute (API) does not believe that secondary containment is necessary under all conditions. Recommended practice suggests the use of secondary containment at locations within 300 feet of public drinking water. In 1984 they published a review, **Secondary Containment For Underground Petroleum Products Storage Systems At Retail Outlets**, which provides a data base of secondary containment practices which can be used in selecting a secondary containment system. It can be helpful for regulatory agencies and for working with regulatory agencies. ■

LUSTLINE

Editor, Ellen Frye

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LUSTLINE will be issued four times as a communication service during the Subtitle I RCRA Hazardous and Solid Waste Amendments rule promulgation period.

The New England Interstate Water Pollution Control Commission was established by an Act of Congress in 1947 and remains the oldest agency in the Northeastern United States concerned with coordination of the multimedia environmental activities of the States of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont.

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EPA Release Incident Study

Tanks leak. Everyone working in underground storage tank programs knows that. How, why, where, and when they will leak, and what impacts those leaks will have are not so clearly known.

Last summer, as LUSTLine reported on several State efforts to assess reported tank system leaks, EPA was beginnning to gather information from the 50 States on such releases through its own **Release Incident Study**. Prior to this study, the only publicly available information on leaking tanks nationwide was a 1981 report by the American Petroleum Institute. Since 1981, thousands of leaking tank systems have been discovered or detected. Some of them were reported to State regulatory and response agencies and have become part of EPA's release incident data base.

Visits to Water Control Boards, Fire Marshals' offices, Departments of Health, and assorted Environmental and Natural Resources offices identified 12,500 documented cases of releases from underground storage systems. Seventy-five percent of these incidents have been reported since 1980. This documentation has been compiled into EPA's central data base for evaluation of the major causes and effects of tank failures. This assessment will help guide and support the development of technical standards.

Even before visiting State offices, it was obvious that case files would contain information gaps, and in some instances, probably more gaps than information. Clearly, information that could help mold regulatory development is not foremost in the field inspector's mind when responding to complaints about leaking tanks. Factors of importance to field personnel, however, such as time and location of release, cause of release, material released, and corrective measures taken were reported in over 75% of the incidents. Many other data elements, such as soil characterization and duration of the leak, were rarely reported.

The scope of State incidence reporting ranged from simple statements indicating that a service station gasoline tank had leaked and had caused a gasoline plume to form on the groundwater table to others that also included data on tank size and age, material of construction, soil type and aquifer depth, and well documented health or environmental impacts. States yielding the most comprehensive data were often those that had already developed their own data forms and/or those with a long history of regulating underground storage tanks.

Why Tank Systems Fail

Not surprisingly, these data indicate that there are many causes of tank system failure. Many of the incident files lacked specific information, only reporting causes as "holes, leaks, and natural phenomena". The most commonly reported causes of subsurface releases were corrosion, structural failure, improper installation, and loose fittings. Corrosion was a problem for steel tanks and pipes, but for fiberglass, structural failure and improper installation were key factors. Loose fittings and poor installation were noted much more often for piping releases than for tank releases. In addition, about 15% of the reported release incidents were caused by overfills and spills, a problem that OUST will study further before proposing regulations.

Sensory Leak Detection

Most of the release incidents on file were detected haphazardly, by sight, smell, or taste, rather than through a systematic detection effort using detection equipment or inventory reconciliation methods. A comparison of cases in which both leak detection methods and quantity released were reported suggests that inventory reconciliation is less sensitive at identifying leaks than detection equipment and should not be the sole method relied upon. EPA, through its labs in Edison, New Jersey and Las Vegas, Nevada, is examining several types of equipment for detecting and monitoring leaks to help focus the leak detection portion of the UST regulations. Underground storage tank releases need to be detected before their impacts reach peoples' eyes, noses, and taste buds.

This first attempt at collecting nationwide data on reported releases will give EPA a better understanding of the scope of the UST program. It adds the weight of conclusions drawn from a large national data base to what had been primarily a collection of anecdotal information. While there are some problems inherent in interpreting a data base that was not drawn in a statistically random method, this study provides data that can help form several regulatory decisions.

OUST plans to have the Release Incident Report available for public distribution this summer. In addition, the Office will fill in some data gaps with information to be collected this summer from key counties and municipalities. This will be available in the fall either as an addendum to the Release Incident Report or as a separate publication. ■

Steve Glomb (202)382-5866

OUST 'Force' *continued*

sing notification data are two examples of this.

"In franchise organizations," Brand adds, "monitoring the performance of individual franchises also carries with it the responsibility to help diagnose problems and provide support in their solution."

Promote Innovation

Brand feels the program can develop to be nationally consistent and rigorous, yet strive toward being locally flexible and innovative. "Since we don't have all the answers right now, and many States have come up with various approaches that might work well, why should I force them into a straightjacket?

"We need to recognize that we are dealing with a rapidly evolving UST field," he explains. "In our regulations and programs we want to provide a means for incorporating innovation and change. We don't want to lock our entire field into today's technology. For example, in Sweden, where self-service gas stations started, they have now spawned another concept. . . 'unmanned, automated stations.' These stations are open 24 hours a day and have no attendants. Our programs need to be flexible enough to respond to such a change if and when it comes to the United States."

Facilitating Voluntary Compliance

Because of the large number of tanks subject to regulation (the Agency estimates over one million, excluding farm and residential heating oil tanks), and because most of these tanks are owned by

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Fate, Transport and LUST

The title of EPA's newly completed Fate and Transport Study may bring to mind Orpheus' star-crossed journey to the underworld. Indeed, EPA's study is about the underworld, not of Greek mythology, but of the fate and transport of regulated substances from leaking underground storage tanks. Followers of UST issues may well concur, after embracing and digesting this voluminous two-volume fate and transport encyclopedia, that Greek drama pales compared to the drama of wayward regulated substances.

The report, prepared by Camp, Dresser & McKee, Inc. for EPA, helps provide a good understanding of the science that describes the activity of leaked substances in the environment. While the document does not provide any direct guidance for preventing or remedying leaks, it will be a useful resource for those involved in promulgating UST regulations and for anyone concerned with UST programs regardless of their technical background. The study indicates there are some important gaps in our understanding of the subject. For example, if we want to develop predictive tools, we need to know a lot more. Also, this study looks at individual substances and not the effect of mixing particular substances.

The Transport of a substance refers to the mechanisms that govern its movement in the environment. The Fate of a substance refers to all of the physical, chemical, and biological changes it undergoes in the environment. This report focuses on the fate and transport of the petroleum and hazardous substances to be regulated under RCRA Subtitle I. An estimated 90% of UST's store petroleum products. According to the report, of the 698 regulated hazardous substances, 477 are likely to be stored in UST's.

In examining the physical, chemical, and toxicological properties of the substances stored in underground tanks, the report determined that the hazardous components of gasoline and fuel oil fall in the middle range groupings for the study's three specified impact scenarios of groundwater contamination, human exposure to toxic vapors, and ignitability. This means that in terms of the risk factor for petroleum products, these products should be treated in the same manner as hazardous substances.

The report indicated that although little toxicity data is available for most bulk petroleum products, the percentage of aromatic compounds (e.g. benzene, toluene) found in these products may be a good indicator of relative toxicity. Leaded gasoline is being replaced with more and more aromatics. Petroleum product additives have added to the overall level of toxicity of these products.

Some UST leaks have caused extensive and expensive environmental damage and the report cites four recent case studies which illustrate the types of problems caused by leaking UST's. However, there are some incidents where large volumes of product have escaped with far less severe effects. The report addresses the variety of factors, such as the characteristics of leaked material, the hydrology of the area, the type of soil in which it leaked, and the general climate of the area, which influence the impact of a leaked substance on public health and the environment.

Through the understanding of fate and transport mechanisms and the properties of UST-regulated substances plus the consideration of environmental setting and site-specific information, the findings of this report can be used to prioritize actions for such tasks as compliance monitoring, corrective action, and enforcement.

The study is now being reviewed by EPA and State UST staff and will be available to the public later this summer. ■

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Disposing of Used UST's

There has been a flurry of tank yanking activity nationwide. EPA and the States have received numerous calls from tank owners who want to know the proper procedures for getting rid of their old tanks.

This sudden interest in tank disposal is primarily because of the Federal May 8 deadline for notifying State agencies of the location and condition of UST's. But, the Federal law and most State laws also say that tanks that "have been removed from the ground" do not have to be registered. Thus many tank owners with aging storage tanks that are either no longer in use or that are due for replacement have taken this "golden opportunity" to get rid of tanks rather than register them.

EPA will address the issue of closure in its tank regulations, but at present there are no "hard and fast" rules for closure. In fact, the handling and disposal of UST's is still loosely controlled in most States. In response to Federal and State waste disposal requirements, some private disposal facilities have developed their own policies and procedures for dealing with tank waste materials such as sludge and water, and for disposing of tanks.

Massachusetts has uniquely provided 5 designated "tank yards" for the disposal of all old steel tanks. Lately, however, the processing and shredding of these tanks has been backlogged because of all the tank yanking enthusiasm.

Despite the absence of tank disposal rules, tank owners who call EPA on this subject do receive guidance. First of all, tank owners are advised to check with their States to see if specific closure regulations are already in place. If this is not the case, then owners should refer to the National Fire Protection Association's Flammable and Combustible Liquids Code of 1984 (NFPA 30) and the Uniform Fire Code. Both contain sections which specifically address abandonment and removal of UST's. Local fire marshals generally refer to these codes to make determinations on the proper handling of out-of-service tanks. Some States have already adopted these codes as part of their fire code.

NFPA 327, Standard Procedures For Cleaning Or Safeguarding

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Regional Update *continued*

Local Involvement Important

In most areas, fire departments are already involved with tanks to some degree under the Uniform Fire Code. Ultimately, involving local agencies in the UST program is believed to be a necessity, because manpower and logistic constraints prevent both EPA and the State agencies from on-site involvement in more than a token number of tank installations and removals. An additional task the Region hopes to begin within the year is an assessment of local capability and degree of interest in UST program involvement. ■

This Regional Update focuses on Region X and is written by Joan Cabreza, Region X's UST Program Coordinator (206/442-0344)

Regulation in the Pacific Northwest

Unlike many other regions, none of the Region X States has an established tank program at the State level, and only one or two counties have tank legislation aside from the Uniform Fire Code. Only Oregon has enacted enabling legislation specifically for underground tanks. One positive aspect of the Pacific Northwest's previously low degree of involvement is the chance to learn from some of the mistakes and problems encountered in other States. Hopefully, Region X states can thus avoid some major pitfalls, such as the legislative mazes that can result when numerous diverse sets of local legislation are developed prior to the State legislation.

One somewhat unique feature of Region X is that in addition to the regional headquarters office in Seattle, the Region maintains five small operations offices, one in each mainland State and two in Alaska. Although these offices presently have very limited involvement in UST, their role is expected to expand in coming years. This local presence will be a particularly important asset in States which do not receive program delegation, where EPA becomes more directly involved with enforcement and inspections.

Preliminary Notification Results Surprising

Regionwide we originally expected notification to identify a maximum of 110,000 tanks. Preliminary results of the notification indicate the totals may be greater than expected in some States. Structurally, these appear to be all types ranging from conventional tanks to (at least one) buried railroad tank car and a few brick and mortar "tanks".

The Seattle regional office is focusing much of its present effort on helping States establish their programs. All four States have applied for UST grants ranging from $80,000 to $140,000. State commitments under these grants range from Alaska's involvement, which is limited to management of notification and referrals of interim prohibition complaints to EPA, to Oregon's comprehensive program that includes developing a tank installer certification program and investigating alternative State program funding mechanisms.

The State notification program are well underway. All States but Washington are using the EPA form, although Oregon has developed a voluntary addendum to the form. This is intended to provide information which will be used by Oregon to assess impacts of various potential regulatory strategies on the community.

As tank regulation is a relatively new concept in the Region, many people are only slowly becoming aware of the Federal requirements. A number of agencies and groups have actively helped to bridge the information gap. Product distributors in several States has distributed notification forms to their customers as a means of fulfilling their own notification obligations under the law. In Alaska, the Department of Transportation volunteered to identify and distribute forms to over 200 widely scattered airports. Fire Marshals in several States have also helped to disseminate information.

Indian Land Notification

As in other regions, Indian land notifications are the responsibility of EPA, rather than the State agencies. The management of Indian notifications is probably of greater magnitude in Region X than other regions because the region contains the largest number of tribes and tribal confederations: 4 in Idaho, 26 in Washington, 7 in Oregon, and 1 in Alaska. (Most Alaskan Indians do not have reservation lands.)

In response to a Regional request, 38 tribes and confederated tribal groups have appointed UST coordinators who coordinate with EPA and assist in distribution of information and notification forms. Two additional Region X tribes geographically overlap with Region IX, who oversees the notification process for these tribes, and forwards appropriate forms to Region X. This arrangement permits "shared" tribes to deal with only one EPA region.

In areas where Indian land ownership is in dispute, EPA and the State have agreed that tank owners may either notify the State on the State form, or notify the EPA on the EPA form.

Programs Flexible to Unique State Needs

The four regional States are quite distinct in organization, geography, economics, politics and environmental philosophy. Program implementation methods that will work in more ubanized areas of Washington often will not work very efficiently in more rural, widely dispersed and inaccessible areas of Alaska, or in the independent "frontier minded" areas of the region. Given individual State differences, the region hopes to strike a balance that preserves regional uniformity yet maximizes State flexibility. The Region therefore encourages innovative and creative program approaches that meet individual State needs, but also encourages State information exchange to promote regional cohesiveness. Other management aims include establishing a good rapport between regulators and regulated community, and maximizing interface with other existing programs and groups such as the groundwater and toxics programs and the fire department.

Tank Failure and the Pacific Northwest

One Region X concern is that many tank studies done elsewhere may not be representative of Pacific Northwest conditions because of the rural nature of much of the region or climatic peculiarities such as Alaska permafrost, Idaho desert, and Washington seasonal high water tables. For example, in the northern Alaska region, an estimated two thirds of all buried tanks are located in the continuous permafrost zones. The majority of tanks are buried in the active permafrost layer, four to eight feet below ground, where frost heave and adfreeze force cause shearing, breaks and cracks, and an above-average leaking tank rate.

One important goal the region hopes to accomplish early within the program is an assessment of tank owners' knowledge and performance expectations, determination of installers' expertise, and an identification of the types of actions, attitudes, gaps in knowledge, and special local conditions which contribute to local tank failures.

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RI Steel Tank Violation/ Bungled Tank Relining

The Rhode Island Department of Environmental Management (DEM) has issued a Notice of Violation and Order to Correct to an automobile distributor for violation of Interim Prohibition and failure to follow proper closure procedures. A DEM staff person noticed two used tanks sitting above ground and later discovered that two new 2000 gallon bare steel tanks containing waste oil and motor oil had been installed in July 1985.

Federal Interim Prohibition regulations barring the installation of unprotected bare steel tanks and Rhode Island's UST regulations both went into effect in May 1985. Thus, the installation was in violation of both State and Federal law. Since the violator had already dutifully registered both of his old tanks according to State requirements, he had been informed of installation and closure requirements.

The violator signed a consent agreement with the State of Rhode Island and has since taken the following corrective steps:

- the tanks were inspected, and tanks and lines were cathodically protected with anode bags
- spill containment basins were installed
- a continuous monitoring system was installed
- precision tests were performed on both tanks

The violator also paid a fine of $525.00. Fortunately, the old tanks were in good shape so there was no product loss to the surrounding soil. The old tanks were disposed of according to State requirements.

Rhode Island has recently issued another notice of violation which may say something about Tank Relining. Five existing steel tanks were precision tested in accordance with State requirements. Two tanks failed the test so the owner had all five tanks emptied and relined. Rhode Island allows a tank to be relined once as long as no leaks are detected by precision tests following the relining. When the tightness test was performed again for these relined tanks, all 5 tanks failed the test. Monitoring wells which had been installed around the two tanks that originally failed quickly showed evidence of product loss.

Two major problems accounted for these leaks, one was improper piping repair and the other was improperly replaced manways. The State has issued a Notice of Violation and an Order to precision test the tanks, as well as a number of other corrective measures. The DEM has since adopted a policy of inspecting tanks prior to relining.

Other States' regulations address the issue of tank relining in a variety of ways. For example, Massachusetts does not allow relining of any tank which has leaked as a result of corrosion. In contrast, New York and New Hampshire allow failed tanks to be relined provided they have no open seams or splits, and if they have less than ten holes with none greater than ½" in diameter; relined tanks must be precision tested after relining, but before backfilling. ■

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UST Disposal *continued*

Small Tanks And Containers, also has information on safe procedures for out-of-service tank handling operations. Finally, the American Petroleum Institute (API) Bulletin 1604, Recommended Practice For Abandonment Or Removal Of Used Underground Service Station Tanks, provides useful guidance on this subject.

In addition, the API has initiated a study entitled Disposal Methods For Used Underground Storage Tanks, which is designed to identify cost effective alternatives for the proper disposal of UST's. This new project will address such questions as: Is, or when is a used tank a hazardous material? How clean does a tank have to be to move off site? What are the proper methods to clean a tank? Can a tank be rendered non-hazardous? and, How best can a tank be disposed of (perforating, crushing, etc.) to minimize present and long term liability? The results of this study should be available by early fall and will ultimately be used to update Bulletin 1604. ■

OUST 'Force' *continued*

local gas stations, Brand feels it is crucial that the Agency build a program that can be easily implemented by the States. He explains, "the program will only succeed if State and local governments can reach and change the behavior of the thousands of tank owners across the country.

"We believe that most people will obey the laws and regulations if they can readily understand what is expected of them. We would like to be able to make these requirements fair and reasonable. The tank owners' Notification Form was designed along these lines. Our requirements will have to be clear to all the players . . . tank owners, inspectors, installers.

"I'm concerned about the real work that will be out there when the regulations are in place (they are running about a year behind schedule). I want to know that who ever is inspecting that tank system knows what they are looking at, and what they are looking for. The installer has to know how to do it properly and, ultimately, the tank owner has to know what's what.

"The EPA has to get this kind of information out . . . here's how to do it . . . this is acceptable . . . this is not acceptable." Brand adds that OUST is spending research money on looking at practical management practices that work, as well as ways to do things better.

In trying to make this program simple, there are some tough issues EPA will need to tackle. For example, it is no secret that when many existing UST's are tested for leaks, large numbers of leaks will be discovered. Also, results from EPA's study of tank tightness testing methods will not be available for 6 months to a year, so the Agency will find it difficult to provide acceptable vs unacceptable guidance on this issue for awhile.

Decision-Making Guides

OUST's guiding principle is the protection of groundwater. The Agency has selected groundwater as its protection priority because it ultimately encompasses other concerns, foremost of which is human health.

Thus, with this guiding principle of groundwater protection and the need for a workable, implementable, and consistent approach toward managing and regulating USt's, the Agency has initiated numerous studies to enhance its

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Proper Installation Imperative

Interest in improving the quality of UST installation is growing rapidly nationwide. According to Ron Brand, Director of EPA's Office of Underground Storage Tanks, no matter how good the underground storage system, if it isn't properly installed, it is likely to leak. EPA data indicate that up to 40% of UST leaks may be caused by human error during tank or piping installation.

"We need to improve our system of installing," says Brand. "Installers need access to instructions, tools and devices for doing the job properly. We need to be assured that installation is being done by trained and reliable people so that we can move toward significantly improving our record of tank and system failures."

While many States are considering some kind of installer certification program, at present, only the State of **Maine** has officially begun such a program. The Maine board of UST Installers held its first written exams on April 1 and 24th. Of the 266 who took the exam, 222 scored greater than 80%, which is passing and certifiable.

The exam consisted of 100 questions taken from State regulations and a compilation of documents on installation. Prior to the exam, participants were given 194 study questions along with copies of the documents. The documents had been referenced for easy information access for use both in studying for the exam and, more importantly, for future reference on the job. The Board will continue to update any changes in technology and pass new information along to the certified installers.

Through this program, the Board now has a mailing list. This is important because Maine installers had always been independants with no real information network. The certification program provides an information channel as well as some trade cohesion and credibility.

According to one Board member, aside from the usual grumblings about paperwork, bureaucracy, and fees, the installers seem to feel positive about this program. They now know they are recognized as an important group. Furthermore, certification should eliminate the Saturday contractor who often does a shoddy job and underbids the full time installers. Program participants also indicated they learned a lot about things they didn't understand such as cathodic protection.

Most of the participants spent more than 20 hours studying for the exam. The results showed no correlation between years in the business and test scores. Copies of the study questions can be obtained from the Board by sending $35.00 and a note requesting the **Tank Installer Study Material** to: Board of Underground Tank Installers, Maine Department of Environmental Protection, Station 17, Augusta, ME 04333.

Florida is close to passing some kind of certification program. At present, installation must be done by individuals with either a general contractors or a plumbing contractors license. But testing for either license has generally had only one, or no questions about installation. Proposed legislation is directed toward creating a separate **Pollutant Storage System Specialty Contractor.** Many full time installers want the State to formulate questions that specifically cover tank and piping installation.

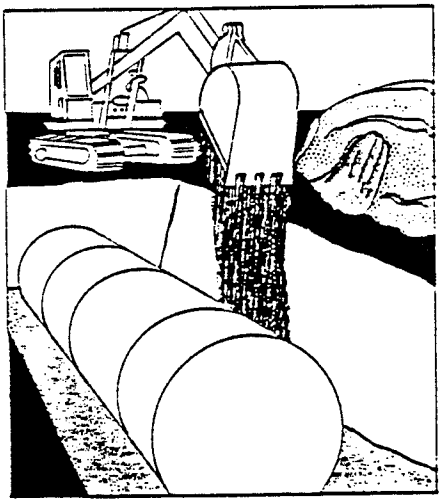
Other States, such as Connecticut, New York, and Rhode Island, refer in their own State regulations to NFPA 30 and manufacturers' instructions for the installation of UST's. New York also has detailed installation specifications and requires a signed statement from the installer, attesting the installation requirements have been followed. In Massachusetts, tanks can only be installed by tank manufacturer certified installers. Also, installations must be inspected by the local fire department.

Currently there are no official installation methods that have been approved by the EPA. The Agency recommends interested persons contact either the Steel Tank Institute, (202)223-6222, or the Petroleum Equipment Institute (see article on new booklet) for a copy of recommended installation practices. Also, most manufacturers include installation instructions with the tank when it is shipped. These instructions should be followed as closely as possible. ■

New UST Installation Manual Available From PEI

Recommended Practices for Installation of Underground Liquid Storage Systems is the title of a new publication prepared by the Petroleum Equipment Institute (PEI). This 36-page manual is intended to serve as a guide for the proper installation of underground tank and piping systems at service stations, C-stores, and similar facilities at which commercial liquids are stored underground.

The book contains chapters on excavating, backfill, secondary containment, piping, cathodic protection, and similar aspects of tank installation. The manual also includes three appendices. One contains formulas for calculating the weight required to prevent tank floatout. Another describes procedures for calculating sacrificial anode requirements. The third lists sources of other technical publications on installation of underground storage systems.



The manual was in preparation for more than a year and has been reviewed extensively by oil company engineers, environmental regulators, equipment manufacturers, and installation contractors. The publication, with its 39 line drawings, effectively captures the state-of-the art in tank installation in an easy-to-understand and accessible way.

The Petroleum Equipment Institute, established in 1951, is the international trade association for the petroleum marketing equipment industry.

To Order: Single copy price of PEI RP 100-86 is $10 ($8 for PEI members). A 3% discount is offered for 25–49 copies; a 7% discount for 50-99 copies, and a 10% discount for 100–499 copies. Payment must accompany orders. Orders should be sent to Petroleum Equipment Institute, P.O. Box 2380. Tulsa, Oklahoma 74101.

Florida's Proposed Petroleum Cleanup Bill

Florida's permeable soils and high water table render its groundwater highly susceptible to contamination, and groundwater is the drinking water source for over 90% of the State's population. Concern for groundwater prompted the passage of the Florida Water Quality Assurance Act in 1983.

From this authority, the Department of Environmental regulation (DER) developed the Stationary Tank Rule. This rule requires tank storage facilities to register the tank systems, maintain inventory records, monitor for leaks, report discharges to DER, upgrade or replace tanks in accordance with an established schedule, and contain, abate and cleanup discharges. Industry has expressed concern about the cost of complying with this regulation, because, in complying, an average facility could face costs of $40,000 to $75,00. However, if a leak occurs, average site cleanup costs could range from between $150,000 to $250,000. The small facility owner could be forced out of business due to the expense of cleanup even if he complied with all the rule requirements. Also, pollution liability insurance has been next to impossible to obtain.

Another concern centers on providing a speedy alternate drinking water source to residents with contaminated wells. DER has funds to provide bottled water, but provisions for a more permanent alternative water source are not allowable under existing authority. Right now, when a leak is discovered, if responsible parties cannot be identified or cannot pay, a lengthy investigation process must be initiated by DER to determine the responsible party. Meanwhile, relief to the contaminated well owner is delayed until this investigation is completed.

A third issue is directed toward the detection and reporting of leaks. Industry has indicated that some owners are not reporting leaks to the DER as required because of fear of being closed down. Since leak detection devices are required for all tanks installed before 1970, there is some fear about what will be discovered in this older tank population when devices are installed. The DER's main concern is that the longer a leak remains unreported or undetected, and the longer remedial actions are delayed, the greater the threat to the public health, safety and welfare, the greater damage to Florida's environment, and the higher the eventual cost to contain and remove the contamination. If cleanup actions could be initiated quickly, all parties would benefit.

Committees of the Florida Legislature have been meeting since November, 1985 to address these concerns. The House of Representatives Committee On Community Affairs has prepared bill number 269. The Senate Committee On Natural Resources has prepared bill number 206 for the upcoming session.

The March 30, 1986 version of these bills, referred to as the Florida Super Act, would:

1) Enable DER to provide swift restoration or replacement of residential drinking water supplies contaminated by leaking petroleum tanks. Funding would come, in part, from an existing Water Quality Assurance Trust Fund.

2) Create another "Super Fund" account to provide funds to be used specifically for petroleum cleanup. The money for this $50 million account would come from a ten cent per barrel tax on petroleum products coming into the State, (including all liquid fuels except LP gas and certain residual fuels), and a tank registration fee of $50 for the first year and $25 for each year thereafter. This excise tax would be reactivated when the fund falls below $25 million and deactivated when the cap is reached. The tax is scheduled to expire on October 1, 1992, subject to legislative review.

3) Require DER to issue registration stickers or certificates to be displayed in plain view at tank sites. The Department of Agriculture and Consumer Services, which routinely inspects retail facilities for product quality, is required to report unregistered tanks to DER.

4) Direct DER to develop a compliance verification program for the stationary tank requirements to be implemented on October 1, 1987.

5) Establish an **Early Detection Incentive Program** to encourage tank owners to meet tank monitoring and retrofitting requirements on or ahead of schedule and to actively seek out and report all leaks as soon as possible.

This Incentive or **Amnesty** Program encourages the reporting of petroleum contamination sites to DER in writing between July 1, 1986 and October 1, 1987. With specific exemptions, these sites would be cleaned up at the expense of the Fund. ■

John Svec (904) 488-0300

DoD Evaluating Tank Testing Methods For Jumbo UST's

Tank integrity testing is an important element of underground storage tank management. Federal regulations will likely include tank testing requirements and many State and local regulations already have such requirements as a means for detecting or verifying leaks. The EPA is currently evaluating in-tank testing methods at a research facility in Edison, New Jersey. The Agency is also beginning a similar study of external monitoring methods at an ORD research lab in Las Vegas.

The results of these studies will be available in Spring of 1987 and should provide important information on which methods meet the performance criteria, as well as guidance on how to perform the tests.

A significant problem developed when the Department of Defense (DoD) began testing its underground storage tanks. The Department found that commercial tank testing methods (of the type being evaluated by EPA) were not adequate or appropriate for testing very large storage tanks such as those found at many DoD installations. The National Fire Protection Association (NFPA) leak detection standard of 0.05 gallons per hour was established with smaller-sized tanks (e.g. 10-20,000 gallons or less) in mind. Basic calculations which assume high instrument precision and very low ambient interference levels for factors such as temperature changes and vapor pockets suggest that for larger tanks there may be no practical method of achieving NFPA standard.

The DoD uses several thousand underground bulk storage tanks (UBST's) for the storage of petroleum products. Typically, they are one of two types. Category I tanks,

usually ranging in size from 20-50,000 gallons, are typical of such operations as flight lines. Category II tanks, containing 50-80,000 barrels of fuel, i.e., 2.1 to 3.36 million gallons, are used at DoD tank farms. Because these tanks differ so markedly in scale from most underground storage tanks, the DoD has questioned whether Federal and State regulations are directly applicable to UBST's. Consequently, the DoD has decided to evaluate whether existing precision tank tests can be effectively applied to UBST's at DoD installations.

This evaluative research is being conducted for the Defense Environmental Policy Office by the Midwest Research Institute (MRI). The contract, administered by the U.S. Army Corps of Engineers, Huntsville Division, will do the following:

- review Federal and State regulations, both existing and proposed, and pertinent DoD documents, such as directives and manuals, relating to UBST's and leak detection requirements;
- evaluate available UBST detection methods and determine their applicability to DoD facilities;
- identify site specific problems at DoD installations;
- field test a recommended UBST leak detection method to verify its suitability for DoD installations; and
- develop a tank test strategy to insure the highest probability of detecting leaks in UBST's.

MRI is currently reviewing LUST regulations and leak detection methods and conducting preliminary site assessments at two DoD installations in California-March AFB and San Pedro Defense Fuel Source Point (DFSP). It is anticipated that the recommended leak detection method will be field tested in mid-summer.

This research will help the DoD implement a workable and effective UBST management program. ■

L. Peter Boice, DoD Defense Environmental Leadership Project, (202) 653-1273

To order copies of LUSTLINE, Bulletin 3, call HOTLINE (800) 424-9346. Solid Waste Document # EPA/530-SW-86-010.

Questions and Answers

EPA receives numerous UST questions on the Hotline. This issue of LUSTline addresses some of the most frequently asked questions about ***Definitions*** *and* ***Exemptions*** *for purposes of Notification. The following definitions represent current EPA policy. These terms will not be final until they are proposed in the Federal Register and public comment is taken into consideration.*

Under Section 9001 of the 1984 RCRA Amendments, Underground Storage Tank means "any one or combination of **Tanks** (including underground pipes connected thereto) which is **used to contain an accumulation of regulated substances** and the volume of which (including the volume of the underground pipes connected thereto) is 10 percent or more **beneath the surface of the ground.**"

Q. What is the definition of a "tank"?

A. A tank is a stationary device which is constructed primarily of non-earthen materials (e.g., wood, concrete, steel, plastic) which provide structural support. Under this definition, almost any type of container (e.g., underground sumps, dump tanks) would be considered a tank.

Q. What is meant by "used to contain an accumulation of regulated substances"?

A. This means that a UST that contains regulated substances for any period of time, no matter how small the amount, is within the jurisdiction of Subtitle I. There is no *de minimus* or small quantities exclusion, although such an exclusion is likely to be included in later technical regulation of UST's.

Q. What is meant by "beneath the surface of the ground"?

A. A tank is 10% or more beneath the surface of the ground if its volume (including the volume of its connected piping) is either 1) 10% or more below ground surface or grade, or 2) 10% or more below ground surface or otherwise covered with material so that expeditious inspection is precluded.

This definition addresses two situations in which a tank would be considered underground. First, a tank may be considered an underground storage tank even if 10% or more of its volume is *not* covered by ground material as for example a tank that is in a below grade containment area (such as a swimming pool or a ditch).

Second, if 10% or more of the tank volume is covered by ground material, either below or above grade, the tank is within UST jurisdiction. This means that tanks that are above ground but mounded over with dirt (to comply with local fire codes) are within UST jurisdiction.

The definition of underground storage tank excludes nine types of tanks which would otherwise be subject to UST regulation. The following questions and answers are most frequently asked about **excluded tanks.**

Q. What is a "farm tank"?

A. A farm tank is a tank located on a tract of land devoted to the production of crops or raising animals, including fish, and associated residences and improvements.

This definition is based upon that used by the Internal Revenue Service in connection with tax exclusions for farmers. To be exempt from UST jurisdiction, a farm tank must be located on the farm property. "Farm" includes fish hatcheries and rangeland. "Farm" does not include laboratories where animals are raised, land used to grow timber, or pesticide aviation operations.

Q. What does the "storm water or waste water collection system" exclusion encompass?

A. A stormwater or wastewater collection system is defined as piping, pumps, conduits and any other equipment used to receive and convey surface water runoff resulting from precipitation or domestic, commercial, and industrial wastewater. The collection of stormwater or wastewater must be directed towards conveyance, and does not include storage or treatment of stormwater or wastewater except where incidental to conveyance.

Excluded from UST jurisdiction under this definition are tanks associated with stormwater or wastewater sewer systems. Tanks that are part of wastewater collection systems at industrial facilities are also excluded under this definition so long as the tanks are primarily used for collection and conveyance of wastewater or stormwater. Tanks used for storage or treatment of stormwater or wastewater not incidental to collection and conveyance, such as wastewater treatment tanks at industrial facilities or municipal water

Continued on page 12

The Retail Gas Station Insurance Predicament

Retail gas station owners and operators are caught in an insurance dilemma. It's a "sign of the times" and a sign of uncertainty . . . how many leakers are out there? . . . how much damage has been done? Many States either require or plan to require tightness tests for tanks at specified ages or intervals . . . EPA is also considering such an option. This will lead to the discovery of many more leaks and, undoubtedly, more cleanup costs and liability claims. Insurance has covered many of these costs in the past, but many tank owners who need it most, now find such insurance difficult, if not impossible, to get.

Right now, only two insurance groups are marketing and writing gasoline station policies; The Planning Corporation and Federated Insurance. These policies cover government-ordered cleanup costs, third party liability costs, and associated legal costs. Premiums are determined by tank age (main factor), size of operation, previous claims experience, and the location of the facility. (Facilities located in States with tough UST requirements, e.g. California, Florida, New Jersey, are subject to higher premiums.) Also, throughout the country, additional surcharges may be levied for facilities with older and/or bare steel tanks.

Because of the risk involved in covering underground storage systems, many insurance policies are actually written through reinsurance, which is a pooling of many insurers to reduce the risk to any one insurance company. Recently, the number of companies involved in reinsurance has gone down, resulting in decreased coverage. For example, Planning Corporation currently offers coverage of $2 million per occurrence and $4 million total. Thus, if one facility has five tanks and four are leaking, they are covered for no more that $4 million.

Which gas station facilities are being insured? The major oil companies that own and operate their own facilities generally are self insured. They have their own insurance pool and account for about 47,000 service stations. Also, chain operations, about 46,000 stations, are good risks. They operate under one set of corporate rules and have more assets. Finally, convenience store chains (e.g. 7-Eleven), representing about 15,000 stations, are good risks for the same reasons as the retail station chain operations.

Facilities having the most difficult time getting insurance are very often the people who need it the most. Independent owner/operators and leased dealers, about 79,000 stations, are considered unknown risks in the insurance world. They are a geographically dispersed group. Often the higher risk stations (older tanks, etc.) of this group are the ones who try to get insured. The less risky facilities . . the ones with newer tanks or those with careful and conscientious maintenance standards, may not try to get insurance, gambling on low risk probability.

This insurance problem is being handled in a variety of ways. Some major refiners are attempting to include their leased stations in an insurance pool. Some States are also trying to deal with this problem. Michigan, for example, is planning to establish an insurance program for service stations that can't get insurance.

At present, there are a number of factors influencing the thinking of the insurance industry: 1) the number and size of claims are increasing, especially in States with stringent regulations; 2) uncertain "exposure" . . . the new EPA requirements, the timing of the requirements, the size of the third party and legal costs; 3) the financial health of the insurance industry, in general; and 4) the desire within the insurance for tort reform.

The EPA is doing studies to see if financial responsibility requirements are needed to cover cleanup costs and third party liability. ■

Sammy Ng (202) 382-7903

National UST Survey To Be Released

The EPA Office of Toxic Substances has completed a survey of motor fuel UST's in support of OUST. The survey, **Underground Motor Fuel storage Tanks: A National Survey**, was conducted over the last two years and is scheduled for public availability in June. EPA will evaluate the survey results for guidance in regulation development. For information, contact: U.S. EPA, WH562A, OUST, 401 M St. SW, Washington, D.C. 20460, Attention Information Office.

LUST in Germany

As promised in the last issue of LUSTline, we are reporting on some of the more fascinating findings Marcel Moreau, Maine Department of Environmental Protection, brought back from his study of European approaches to the prevention of LUST problems. Marcel was awarded a fellowship from the German Marshall Fund of the United States to study regulatory strategies and UST technologies in Germany, France, England and the Netherlands. Because most Western European countries have a longer history of UST regulation than the U.S., the EPA is also looking toward Europe (and Japan) to gain some insight into practices and technologies that may or may not have worked well.

Marcel Moreau has brought back from Europe a refreshing new perspective on the leaking underground storage tank problem. Moreau's slide presentation of European LUST prevention begins with the observation that there are "significant similarities between the styles of European cathedral gargoyles and underground storage tank technology."

Europe has a long history of environmental regulation. Germany's Environmental Inspection Agency celebrated its 100th anniversary in 1985 and France has regulated the storage of hazardous substances since 1866. The detail applied to UST regulation ranges from Germany's meticulous and pragmatic approach, as reflected in its gargoyles, to England's more simplistic approach of encasing the entire installation in 6 inches of concrete. Again, this is more or less reflected in the absence of gargoyles in England. The genesis of England's approach is, perhaps, rooted in Stonehenge.

Needless to say, the bulk of useful information that Marcel saw fit to convey centered on the West German approach to LUST; France and the Netherlands followed close behind. Germany does not appear to have a significant leaking tank problem anymore. However, this has not always been the case. After converting to fuel oil use in the mid-1950's, large numbers of tank leaks began showing up as corrosion set in, around the mid-1960's. As the problem gained national attention, national experts quickly gathered and thoroughly dissected, deciphered and debugged it.

All German UST's are now double-walled, but they are designed as leak-detection systems rather than dual-containment systems. They are more like single-walled tanks with a leak detection system wrapped around them. Because the outer steel wall is not intended to be used for primary containment of the stored substance, it is thinner and constructed to much less rigorous standards than the primary vessel, which is designed to withstand 29 PSI. The space between the two walls contains antifreeze and is connected to a reservoir above the tank. A leak causes the antifreeze between the walls to storm the breach and set off an automatic alarm in the reservoir. Over half of France has double-walled tanks similar to the German design.

In Germany, France and the Netherlands, piping is often welded together and clad in PVC. Joints are coated in the field with asphalt. Piping is uniformly sloped to the tank.

Manholes are mandatory in the tank and all piping goes through the manholes. There are manways to the ground surface to allow inspection of the piping and leak detection system. This provides easy access for maintenance inspections. Fiberglass is not used in Europe for gasoline storage at service stations, and only the Dutch use cathodic protection. Asphalt coated
steel tanks are prevalent, but the coating is much thicker than in the United States. The coating is electrostatically checked at 14,000-20,000 volts at the factory, and before installation at the site. (Asphalt coatings in the U.S. have, traditionally, not been tested at all.)

In Germany and the Netherlands, tanks are generally not covered over at the ground surface with concrete pads or asphalt. Instead, concrete paving blocks are used in anticipation of the need for access to the tank system should any problems occur. This allows easy, quick, and inexpensive removal and replacement of the pavement.

Inventory controls are considered a good management practice in Europe, but are not used for leak detection purposes.

Moreau observed three key features that seemed to contribute to the integrity of the underground storage systems:

1) *Suction Systems* with single check valves are preferred to submerged pumps as a product dispensing technology. Suction pumps are acknowledged to diminish leaks significantly. The check valve is in the piping beneath the suction pump, rather than at the top of the tank as is common in the U.S.

2) In Germany and France, spill overfills are prevented by sensing devices in the tank which stop the filling procedure when the tank is 95% filled, allowing ample room to then drain the hose into the tank.

3) The double-walled tanks, mentioned earlier, seem to be very effective.

This information just skims the surface of Marcel's store-house of information on this subject. Any group interested in Marcel's presentation can call him at (207)289-2651. He also plans to write up his findings in a report. Information on this will be available in the next issue of LUSTline. ■

American Petroleum Institute Underground Storage System Research Programs

The American Petroleum Institute (API) has been looking into problems associated with leaking underground storage systems since 1969. Over the years, the API has supported a number of research programs with the purpose of investigating the many technical aspects of underground storage systems. A brief description of the most applicable completed projects, projects in progress, and available reports is detailed below:

Analysis of Factors Affecting Service Station Inventory Control

The objective of the study was to identify factors affecting inventory control procedures and to estimate their impact on the effectiveness of inventory control as a tool for detecting product gains or losses. Factors evaluated included: temperature, meter accuracy, vapor recovery, gauging and tank geometry. (Report Available)

Overfill Protection for Underground Petroleum Storage Systems at Retail Outlets

The objective of the study was to develop information on the methods and equipment available to provide cost-effective, technologically feasible and environmentally effective overfill protection systems for underground petroleum storage systems. (Report Available)

Underground Storage System Survey of the API General Committee of Marketing

The objective of the survey was to develop factual data regarding underground storage system numbers, types, and ages owned by companies that are represented on the API General Committee of Marketing. In addition, information regarding the leak prevention and detection programs of these same companies was also compiled. (Report Available)

Observation Wells as a Leak Detection Technique

The objective of the study is to identify, describe and evaluate observation well methods for detecting leaks of hydrocarbon from underground petroleum storage systems. The results of the study are intended to provide a basis for evaluating alternative monitoring techniques for a variety of monitoring conditions and objectives. (Report Available - Spring, 1986)

Automatic Gauging Systems as a Leak Monitoring Technique

The objective of the study is to identify, describe and evaluate automatic gauging system technologies for monitoring an underground storage system. The study intends to document the sensitivity, degree of accuracy and cost effectiveness of the various automatic gauging system technologies. (Report Available - Spring, 1986)

Update of API Publication 1621 - Bulk Stock Control at Retail Outlets

The objective of the study is to evaluate the various inventory control procedures currently being utilized to monitor underground storage systems for losses. The results of the study are to be integrated into API Publication 1621 to improve the leak detection capabilities of inventory control. (Report Available - Summer, 1986)

Secondary Containment for Underground Petroleum Product Storage Systems at Retail Outlets

Disposal Methods for Used Underground Storage Tanks

See related articles.

TO ORDER: Contact Valeen Young, API, 1220 L Street, Northwest, Washington, D.C. 20005 (202)682-8000.

Headquarters Update

EPA is "beefing up" its OUST Hotline . The Agency will have 11 lines by August. The Hotline has been set up to respond to questions on EPA's UST regulatory program. The toll free Hotline number is 800-424-9346. The number for local calls is 382-3000.

OUST has developed the FY'87 State UST Grant Guidance for the Regions to use in negotiating State UST Grants. The Regions and several States and State Organizations met in Washington on May 1 to review and comment on the draft. Final Guidance will be issued in June.

OUST 'Force' *continued*

understanding of the many possibile components of its regulatory options.

OUST has also been following tank regulation experiences both here and abroad. Brand and his staff have relied heavily on the experiences of States and counties with on-going programs. He is also investigating the European approach to UST regulation and related technology because much of western Europe has a 15 year "edge" on the United States.

Ideally, Tank regulation should be an evolving p[illegible] which improves as the u[illegible]ng of better or correct w[illegible] things improves. U[illegible] the tanks are leaking now [illegible] importance of timely decisi[illegible]y not completely allow for the luxury of the ideal world. ■

Questions & Answers *continued*

treatment works, are not excluded under this definition.

This definition excludes sumps when they are part of stormwater/wastewater overflow or conveyance.

Q. What does the "flow-through process tank" exclusion refer to?

A. A flow-through process tank is a tank which forms an integral part of a manufacturing process and through which there is a steady or uninterrupted flow of materials during operation of the manufacturing process. The term "flow-through process tank" does not include tanks used to store regulated substances prior to their introduction into the manufacturing operation, or to store regulated substances as products or by-products from the manufacturing process.

There are two key concepts associated with this term: 1) "flow-through" means steady or regulated flow. That is, the fluid level is subject to constant change during operation of the process, 2) "process" means integral to manufacturing process (as opposed to a process *in* the tank).

Concerning the first concept, defining "flow-through" as including *regularly occurring flows* as well as *continuous flows*, the use of a retention-time limitation was rejected on the grounds that this would be too complicated. The dividing line between "flow-through" and storage would be very difficult to determine.

Concerning the concept of "process", the only tanks that are excluded as flow-through process tanks are those tanks that are integral to the manufacturing process. This means that tanks that hold raw materials *prior* to processing and tanks holding products, by products, or wastes *after* the processing may be subject to UST jurisdiction.

Q. What does the "liquid trap" exclusion refer to?

A. The liquid trap exclusion refers to tanks used for the purpose of the collection and removal of water and other liquid impurities from oil and gas during oil and gas production operations and their attendant production lines.

Although liquid traps are often used in activities other than oil and gas production, the only type of liquid trap excluded from UST jurisdiction under the statute is a liquid trap used for the purpose of separating unused oil and gas liquids from water at oil and gas producing facilities.

However, not all tanks at oil and gas producing facilities will qualify for this exclusion. For example, after removal of oil in a liquid trap, the water (containing some oil residue) may be stored prior to discharge. This oily water would be subject to UST jurisdiction if stored in an underground storage tank. Tanks associated with gas delivery lines that connect the liquid trap to an underground storage tank may be subject to the pipeline facilities exclusion.

"Liquid traps" such as grease and oil traps at gas stations as well as methane gas produced at landfills are not within this exclusion and would be subject to UST jurisdiction. ■

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