

L.U.S.T. LINE



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

EPA Creates OUST

The Office of Underground Storage Tanks (OUST) was created by EPA in September 1985 as a separate program office within the Office of Solid Waste and Emergency response. Ronald Brand, former Director of the Office of Management Systems and Evaluation, in the Agency's Office of Policy, Planning and Evaluation, has been named OUST Director. His Deputy, Penny Hansen, is the former Chief of the Waste Treatment Branch in the Office of Solid Waste. (How many "Offices" can you count in this paragraph?)

The new OUST office was established in response to the November, 1984 Hazardous and Solid Waste Amendments (HSWA) to the Federal Resource Conservation and Recovery Act (RCRA) which require EPA to promulgate regulations to prevent, detect and correct the leaking of underground storage tanks (USTs). The Amendments provide the mandates for OUST's responsibilities which include developing national policies, guidance, criteria, regulations and procedures for assisting the Regions and States in implementing the legislative requirements of HSWA. The Amendments specifically mandate that EPA regulate USTs containing petroleum products and hazardous substances as defined under Section 101(14) of CERCLA, except for hazardous wastes regulated under Subtitle C of RCRA. For the first time, the RCRA program applies to storage of products as well as wastes. The OUST office must define the extent of the existing UST problem, formulate strategies and implement

activities which will prevent future widespread contamination of the nation's groundwater due to leaking USTs.

More than 1.5 million USTs containing hazardous substances or petroleum products are in use in the United States. An estimated 150,000 to 400,000 are thought to be leaking at present and many more will begin to leak as days and years go by. Products from these leaking tanks threaten the nation's groundwater supplies and can also damage sewer lines and buried cables, poison crops and lead to fires and explosions. Because of the large and pervasive number of USTs, many of which are owned by small businesses, the OUST office faces unique and difficult regulatory tasks. In addition, there are at present no Federal funds available for clean-up.

The Office has already de-

veloped and promulgated rules for notification concerning USTs. They must still develop and promulgate rules for corrective action; new tank standards; leak detection; and closure for all tank systems defined as USTs.

The Office has developed various strategies for communicating the mandated requirements and environmental benefits of the UST program to the public and the regulated community. (See **Moving Along With Notification** for further examples.)

OUST, in cooperation with EPA's ten Regional Offices, will develop State program approval guidelines for compliance with Federal performance standards. They will also distribute grant monies to States to implement and carry out their UST activities. At this time, the OUST office is made up of about 15 staff members. ■

Office of Underground Storage Tank Contact Persons

Name	*Phone	Responsibility
Ronald Brand	(202)382-4517	Director
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Ginny Cummings	382-7925	Notification
Arthur Pergam	475-8675	Notification Software
Pamela Harris	475-5413	Enforcement
John Heffelfinger	382-7923	Corrective Action
Susan Mann	382-2233	State Programs
Stephen Nacht	475-6673	Interim Prohibition/ Tank Testing
David O'Brien	382-7924	Tank Standards
June Taylor	382-4623	Outreach

* Phone numbers subject to change.

Moving Right Along With Notification

After the State Governors designated which Agency would receive UST notification forms, the ball bounced to EPA's court and on November 8, 1985 as required by Section 9002 of the 1984 Hazardous and Solid Waste Amendments to RCRA, the EPA published its final rules concerning notification requirements and a notification form to be used by owners of underground storage tanks that store or have stored petroleum or hazardous substances. According to the amendments, tank owners are required to notify their designated State or local agency of the existence of their tanks. The Federal form must be used by all tank owners subject to the law unless the State requires use of its own form.

Now the ball is in the States' court.

The States have been developing notification mailing lists, which is no small task, and are now (or have been) mailing out notification forms to tank owners. Thirty-eight out of fifty-six States/Territories are using the notification form published by the EPA. Some States have chosen to require tank owners to provide additional information and are using separate State-issued notification forms. Several other States are providing addenda to the EPA form as a way of gathering additional information from tank owners.

Due to current Federal fiscal frustrations, the EPA was able to

print only 60,000 forms for its initial mailing to States using the Federal form. However, the Agency did provide each of these States with a camera-ready copy of the form with the State's name and address on it to be used for printing additional forms. EPA plans to supplement this initial supply of forms with an additional 3,000,000 forms with State-specific identification this month.

With the mailing of the notification forms, the ball will bounce into the tank owners' court. At this point, States are waiting to see tank owner response to the May 8, 1986 Federal notification deadline. Once tank owners return notification forms to their State Agency, the business of computerizing and processing the forms will begin in most States. What States ultimately do with this information is their prerogative. The notification process is a means for the States to account for the vast UST universe within their borders and to develop appropriate regulations.

To assist States in this considerable notification task, the EPA has distributed an implementation handbook on UST notification which is a compendium of ideas and suggestions derived from experiences of States that have already carried out such a program. It includes ideas for the distribution and collection of forms, lists of contact organizations that can be helpful in carrying out a program, and general public education tools such as press release formats and radio and television announcements.

EPA has also provided States with a number of publications that should assist in publicizing the UST program, and, in particular, the notification requirements. These include:

- **Notification Requirements for Owners of Underground Storage Tanks** - it has answers to commonly asked questions about notification;
- **Underground Storage Tanks: The New Federal Law** - a brief description of the total program;
- **The Law on New Underground Tanks: Interim Prohibition on Installing Unprotected Tanks** - a simple statement.

Limited copies of these leaflets are available from EPA Headquarters and EPA Regional Offices. Trade associations and other interested groups can obtain camera-ready copies with space on the leaflet for their own name, logo and other information.

Also available are:

- Reprints of the Federal Register notice concerning notification requirements for owners of underground storage tanks;
- List of State agencies designated to receive notification by tank owners;
- List of hazardous substances regulated under the Underground Storage Tank program.

These can be obtained by contacting June Taylor at (202)382-4623. ■

EPA To Introduce Notification Software in January

EPA has developed a computerized data base management system to assist States in organizing and managing notification data. The Agency will hold four 1-day seminars, two in Washington, DC on January 21 and 22 and two in San Francisco on January 28 and 29, to demonstrate the data management system, and give hands-on training to all interested State personnel handling notification data.

The new system manages data for the EPA notification form and for other UST data States are gathering for their own use. This turnkey software package uses a commercially available data base management system called REVELATION and operates on an IBM AT Personal Computer or compatible. The system provides easy prioritization of follow-up activities for UST inspection and it allows States the flexibility to add their own data fields and to generate their own reports.

This past fall the software was tested in Mississippi and New York and subsequent refinements were made based on the recommendations of these two States. The January seminars will provide all other interested States with a brief summary of the contents and some of the capabilities of the data base. At the seminars, the States will be provided with a breakdown of menu-drive system options that are available, some examples of reports that can be generated from the data base, and a technical description of the data base and its hardware requirements.

EPA will provide the application software free of charge to any State that wishes to use it. The Revelation Data Base Management System may be purchased for \$795.00.

LUSTLINE

Editor, Ellen Frye

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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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Life After Notification

As tank owners begin to notify States of the existence and whereabouts of their tanks, the States will form a better picture of the UST universe they will be regulating. Throughout the country, computerese is moving into the world of underground storage tanks . . . UST information is being entered into automatic data processing systems . . . it is being scanned, sorted, tracked, mini main-framed and analysed. Indeed, many of the States are using the notification mandate to its fullest by "takin' stock of what they have and what they haven't". In addition to identifying their regulated tank universe, the States will also have a data base they can use for future regulatory compliance, permitting and corrective action. Most States are using mini-computer systems with EPA's notification software package. Life after notification owes a lot to the silicon chip.

A word of caution to any unsuspecting program coordinator who thinks the data base will be 90% . . . 60% . . . even 30% complete by May 8, 1986. As Robert Burns noted long ago, "the best laid schemes of mice and men, often go awry". Tank owners might be an insufficiently informed group. In other words, inadequate outreach to the tank owners could cause even the best program implementation plans to fizzle due to the lack of punch. Getting the word out on notification is absolutely essential if there is to be an effective UST control program.

Let's ease out of this cautionary rhetoric, however, and examine what States will be doing after notification — in addition to building data bases. As we write, States are developing UST programs, strategies, rules and regulations, enforcement response policies, staff training programs, technical standards and on-going outreach efforts . . . they have a full agenda. **South Carolina** intends to use the notification process: 1) to evaluate the status of its UST's, 2) as an integral tool for developing the State's groundwater strategy, and 3) to require proper closure of abandoned tanks. As **Oregon's** UST data is received, staff will scan the forms for completeness and assign latitude and longitude coordinates for each tank facility. Oregon will develop and implement a data management system which will provide a separate mailing list for tank owners who have not responded to the notification form. They will develop a policy for re-

Continued on page 12

State UST Program Funding Mechanisms

UST regulation is not a passing craze. It is a program that will require an ongoing commitment to address the problems of both existing tanks and new installations. The EPA is encouraging States to investigate and/or develop alternative program funding mechanisms. Some States have moved right along with this task—investigating, developing and even implementing mechanisms designed to keep their programs viable. Here is a look at some of these funding strategies.

★**Wisconsin** - Under a code soon to be implemented, every tank will need a permit at a fee of \$50.00 per permit. Forty dollars of this will go to the local fire department which is responsible for all inspection field work and the remaining \$10.00 will help cover expenses of the State Department of Industry, Labor and Human Relations (DILHR), the agency responsible for the UST regulatory program. In addition, there is a \$35.00 fee for any new tank going into the ground and another \$50.00 installation review charge which is again broken down between the DILHR and the fire department. Finally, the Department of Natural Resources has a groundwater emergency cleanup fund which receives a \$100.00 fee per facility for every new installation.

★**New York** - New UST regulations went into effect December 27, 1985. To run the administration and enforcement of this regulatory program, the regulations provide for a registration fee every 5 years of:

\$250.00 for tanks >10,000 gallons,
\$150.00 for tanks 5,000 to 10,000 gallons
\$50.00 for tanks less than 5,000 gallons.

For spill response and cleanup New York will have a 3½¢ per barrel tax on bulk storage or major terminals. There are about 400 of such facilities in the State.

New York has considered a 1¢ tax at the pump which could also be used for corrective action and program administration. Although this approach has not been utilized in New York, it could be a useful funding approach for *smaller States* which might have fewer tanks but require more revenue than a tank registration fee would generate.

★**Maine** - This State's UST regulations may be in effect by mid January 1986. However, its fee system

is already in effect. The Maine Legislature set up a specific UST fund which is a dedicated revenue account. Money will come from annual registration fees from any facility that sells its product:

\$25.00/tank for tanks <6,000 gallons,

\$50.00/tank for tanks >6,000 gallons.

A transfer fee is assessed against gasoline and other products coming into the State for a Groundwater-Oil Cleanup Fund. This helps fund the UST program, cleanup and alternate water supplies. This fund also receives any violation penalty money and reimbursements for money the State spends on remedial work . . . plus interest.

★**California** - The State Water Resources Control Board oversees the UST program and maintains the total computer file, but cities and counties administer the program and set permit fees to recover their costs. When the State initiated its registration/notification program in 1984, they had an initial registration fee of \$10.00 per container or \$5.00 per retail gasoline container to set up the computer file. This phase is now nearly complete. The State does get a one-time permit surcharge of \$56.00 (subject to change) per tank to help support State program costs.

★**Kansas** - Since 1981 this State has supported its UST regulatory program on an annual \$2.50 (now \$3.00) per buried tank registration fee.

★**New Jersey** - An appropriation of \$2 million for two years will be attached to New Jersey's UST legislation for start-up or "seed" money. The proposed legislation also provides for: 1) initial registration fees, 2) re-registration annual certification fees, and 3) when the rules and regulations are developed, a permit program with fees. ■

NEW ADDRESS FOR NEIWPCC

Since the last LUSTLINE Bulletin the New England Interstate Water Pollution Control Commission has moved. Please note our new address and phone number:

NEIWPCC

85 Merrimac Street

Boston, MA 02114

Telephone: (617)367-8522

Corrective Action In Connecticut's New UST Regulations

Pursuant to Section 9003(c) under Subtitle I of the Federal Hazardous and Solid Waste Amendments to RCRA, UST regulations must include provisions for reporting releases and for corrective action taken in response to a release from an underground storage tank. As provided in Section 9004, States may submit their own correction programs for EPA approval in lieu of the Federal program. However, State programs must be in compliance with Federal requirements and standards. A few States have already adopted UST regulations which are designed to be consistent both with Federal requirements and with their own policies on pollution prevention and control. Connecticut is one such State. The following example details Connecticut's approach toward Corrective Action.

Connecticut's Non-residential Underground Storage and Handling of Oil and Petroleum Liquids regulations were adopted on September 24, 1985 and became effective on November 1, 1985. These regulations were developed within the State's Water Pollution Control Statutes which already contain corrective action requirements dealing with releases of petroleum products from regulated facilities. These Statutes require the immediate reporting of any discharge, spill, loss, seepage or filtration to the State Police who must, in turn, take whatever action the Department of Environmental Protection (DEP) requires. Clean-up requirements are found in several DEP policies and guidelines such as "Contaminated Soil Removal and Disposal Guidelines" and "Clean-up of PCB Contaminated Soil". Clean-up activities are generally coordinated through DEP's Hazardous Materials Management Unit.

The New Regulations

While the new oil and petroleum liquids regulations reiterate corrective action requirements of the Water Pollution Control Statutes, they also specifically cite responsibilities of the owner/operator in the event of a failure and dictate the actions which should be taken at the time of a failure. After reporting a discharge, the owner/operator must immediately empty and discontinue use of the failed facility component and:

- (a) remove or abandon it within

ninety days in accordance with procedures specified in the appendix to NFPA 30;

- (b) repair it within sixty days; or
- (c) replace all damaged components with components meeting new facility standards.

The clean-up requirements of the new regulations require the owner/operator to immediately cease the discharge and reclaim, recover and properly dispose of the discharged liquid and any other substances contaminated by it. They must then restore the environment to a condition and quality acceptable to the DEP, and repair damage caused by the discharge . . . all to the satisfaction of the DEP.

When a failure occurs at a new or existing facility, all of the facility's components must be evaluated within thirty days to determine the existence of conditions similar to those which caused the initial failure. The results of this evaluation are to be reported to the DEP within ten days. Any new failures discovered in the process are subject to procedures previously specified.

Responsibility

The question of who is responsible and who is liable for damages is addressed within the Water Pollution Control Statutes. Under these Statutes, any person, firm or corporation (including owners of regulated underground facilities) which directly or indirectly causes the pollution and contamination of any waters of the State, is liable for damages equal to one and one-half times the cost and expenses incurred, through civil action by the Attorney General.

If the party causing the pollution discharge fails to act immediately to contain and remove or mitigate the effects of the discharge, the DEP may contract to remediate the problem. If the DEP incurs the cost of clean-up, they will move to recover the costs from the responsible party through civil action.

If pollution of groundwater has occurred rendering the groundwater unusable as potable drinking water, the DEP may order the party responsible to provide potable water to those affected by the pollution.

Statutes have a provision which allows the DEP to get a court injunction to order the person responsible to abate the source of pollution.

Penalties

Any person who violates any provisions of the Water Pollution Control Statutes is subject to a fine of up to \$10,000 for each offense. Persons committing willful or criminally negligent violations are subject to fines of up to \$25,000 per day for each day of violation or to imprisonment for one year or both. Intended falsification of statements, representation or documentation is subject to a fine of up to \$10,000 or six months imprisonment or both upon conviction. ■

AMERICAN PETROLEUM INSTITUTE UST SEMINAR AVAILABLE AS EDUCATIONAL SERVICE

The American Petroleum Institute (API) has developed an educational program to assist a variety of audiences in better understanding the UST problem. This flexible presentation is free of charge, can be tailored to the requirements of any specific audience and can vary in length from a 15 minute overview to a full day technical workshop.

The program concentrates on tank leak prevention, detection, investigation and clean-up. A legislative/regulative up-date is often presented and state-of-the-art equipment, materials, and techniques are also reviewed. API continuously modifies the seminar to address new UST developments, to meet audience needs and to improve the overall educational quality.

The seminar is available to all interested parties. Nationwide, over 1100 people have already participated in the program. These audiences typically have included petroleum marketers, owners of underground storage tanks, fire and safety personnel, regulatory officials, and health officials. Nearly every State has used some aspect of the program.

For more information contact Todd Schwendeman, API, 1220 L St., NW, Washington, DC 20005. Phone (202)682-8226.

Regional Updates are written from the perspective of individual EPA regions. By successively alternating Regions, each bulletin can share activities and concerns that are common to all Regions and unique to specific Regions. This issue focuses on Region VII and is written by Faye Sandberg, Region VII's UST Program Coordinator (913/236-2852)

Progress in Region VII

EPA Region VII is working to support the efforts of the States and to develop an appropriate overview program. By September, State UST grant applications had been received from all four Region VII States. These applications were reviewed and evaluated based on the criteria and priorities described in the grant application guidance. The final grant offers were made and comment letters requesting submission of the final grant application were sent in late October. Each designated State agency agreed to conduct the notification activities and to report results to EPA by September 30, 1986. The States are all working toward State delegation by developing the necessary statutes and regulations. Three of four State Agencies agreed to cooperate with EPA on compliance with the Interim Prohibition.

Kansas has been a leader in the regulation of underground storage tanks in Region VII. In 1981 the State passed legislation on leaking underground petroleum tanks. Kansas requires that each new tank installed has appropriate containment and catch basin and an observation tube which is slotted or cut to show immediate leak detection. The State program is supported by fees. In 1984, petroleum tank

owner/operators were required to notify. This information has been compiled into a State data management system. Kansas is also developing a tank installers licensing program.

Nebraska has proposed underground storage tank legislation which generally parallels the federal program. There is some variance in the exclusions and Nebraska does not set a time frame for regulations nor do they propose interim standards. Each tank must be registered annually and a fee will be levied. The major difference in the Nebraska program and that of other states is that it is being conducted as a joint effort between the Nebraska Department of Environmental Control and the State Fire Marshal. Notification forms will be returned to the State Fire Marshal.

The Missouri Department of Natural Resources has been concentrating its activities on developing an inventory of underground storage tanks. It is the Department's intention to have a list established and ready for use within a few weeks after the notification forms and regulations are finalized. At the time of this writing, Missouri had between 10,000 and 12,000 names stored on a commercial computer software package called DEBASE III.

In many ways the Iowa legislation is similar to the Federal program. However, the Iowa program does require fees for underground storage tanks and sets basic standards. Iowa is now developing monitoring requirements. Like Missouri, Iowa is concentrating on developing mailing lists and is preparing to mail the notification forms as soon as possible. ■

Installer Certification A Good Idea

Most States are considering some kind of certification program for UST installers and it makes a lot of sense. The American Petroleum Institute has stated that improper installation is one of two major causes of tank leakage, the other is corrosion. In surveying the UST problem, the EPA has gathered mounting evidence that the quality of installation underlies almost all tank failure problems, including corrosion.

After regulating USTs for four years, the Kansas Bureau of Oil Field and Environmental Geology has concluded that the key element in the successful implementation of any LUST program is the certification and licensing of underground tank installers.

This is why the Bureau plans to direct 10% of its supplemental grant funding to developing a tank installers certification program.

In Maine, the State Legislature recently passed a law mandating the establishment of the Maine Board of Underground Storage Tank Installers. The board was established in September 1985 and is made up of the Department of Environmental Protection and a variety of interest groups like the Maine Oil Dealers' Association, an installer, etc. The Law states that unless the tank installation is certified by this board, as of May 1, 1986, an underground storage tank cannot be installed.

Maine is now designing standards and criteria for testing and is working with the University of Maine on an installers training program. For further information on Maine's certification program contact George Seel, Maine DEP, (207)289-2651. ■

Regional UST Coordinators

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Region VII

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Region VIII

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Region IX

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Region X

Joan Cabreza, Waste Mgmt. Branch (208)442-0344

National UST Mandate Consolidates A Disjointed History

NEW YORK STATE'S PETROLEUM AND HAZARDOUS LIQUIDS BULK STORAGE MANUALS AVAILABLE

New York State's Department of Environmental Conservation has produced 5 indepth comprehensive manuals on various aspects of petroleum and hazardous liquids bulk storage. (One on above ground storage will be available soon.) These manuals are available at a cost from the Environmental Facilities Corporation (EFC).

MANUAL	CHARGE ¹
Siting Manual for Storing Substances A Practical Guide for Local Officials	\$10.00
Administrative & Legal Options for Storing Hazardous Substances, A Guide for Local Officials	\$2.00 ²
Recommended Practices for Underground Storage of Petroleum	\$5.00
Technology for the Storage of Hazardous Liquids, A State-of-the-Art Review	\$10.00
Recommended Practices for above ground Storage of Petroleum	\$5.00 ³

¹Prices may increase if printing and handling costs increase.

²\$2.00 only if requested separately, otherwise Free.

³Available for printing in several months.

Manuals can be ordered by phoning or writing:

Environmental Facilities Corporation Manual Requests
Room 538, 50 Wolf Rd.,
Albany, N.Y. 12205 (518)457-4114

Nationally, the history of UST regulation has centered, predominantly, on fire code authorities with a primary emphasis on public safety. National consensus codes, such as the National Fire Prevention Association's NFPA 30 and 329, have either been adopted or voluntarily implemented throughout the country by States, cities, towns and villages.

Other non-regulatory but invaluable ingredients in past and present UST history include recommended industry practices such as those published by the American Petroleum Institute and state-of-the-art professional guidance from industry representatives; the Steel Tank Institute, Underwriters Laboratories, the National Association of Corrosion Engineers and the American Society for Testing and Materials continue to provide benchmark standards for design and materials. Steel and fiberglass tank manufacturers also supply specifications for tank installation and maintenance.

On the environmental side, States have dealt with groundwater contamination and cleanup concerns through Hazardous and Solid Waste Programs, special cleanup funds, groundwater management programs . . . and in a few states, like Kansas and Maryland, through specific UST regulations promulgated in the late 1970s and early 80s.

These fragmented but essential voluntary/regulatory ingredients have constituted the basis for the viability of the Subtitle I Hazardous and Solid Waste Amendments to RCRA; a Federal mandate which aspires to put the UST "ducks-in-a-row", fill in some significant gaps and provide a comprehensive direction which specifically addresses leak detection, prevention and correction, recordkeeping and closure, and new tank performance standards.

The Law directs States to determine which agency(s) will implement the program, who will do what and how the job will be done. The Law requires a notification process which will help draw the unwieldy UST universe into tangible computerized filing systems and several sorely needed state-of-the-art studies which will help ferret-out the many complex UST-related technologies. Congress' commonsense approach to this very

serious UST problem is probably one reason why the regulated industry has responded positively to the amendments. Generally high on the industry's wish list is a desire for national consistency. However, there will be many instances where States will find it necessary to develop more stringent programs than EPA's.

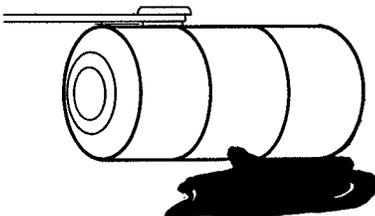
States which initiated UST regulation in advance of the EPA timetable have already gained some UST savvy. EPA has called upon States with rule making mileage like Florida, California and Maine to participate in the various UST work groups. The experience of State fire marshals and local fire departments has dovetailed with environmental agencies as responsibilities are sorted out and, in many instances, specific regulatory roles are divided up.

Kansas has regulated USTs longer than most States. While they will need to strengthen their regulations to comply with Federal requirements, their experiences demonstrate the importance of maintaining a rapport with the regulated community.

Gary Blackburn, Acting Section Chief of Kansas' Bureau of Oil Field and Environmental Geology says his State's readiness to comply with the new Federal program has a lot to do with an on-going relationship with installers, trade associations, fire departments, and the regulated community. He says in the course of being the regulators, they have also learned a lot from the regulated industry and the other authorities sharing UST responsibilities.

The true mark of the Federal UST program will be the regulations themselves. The information being gathered during the rule promulgation period will feed into the evolution of these regulations . . . regulations aimed at one of the most extensive targets in EPA history. The wisdom and workability of the regulations will then be put to the test throughout the country. ■

To order copies of LUSTLINE, Bulletin 2, call HOTLINE (800) 424-9346. Solid Waste Document # EPA/SW-86-002.



Programs and Plans

All of the States, except for Maryland, have applied for FY 86 State UST Grants. States are at various stages of UST program development; some already have regulations in effect and some are still working on getting the enabling legislation they will need to write their regulations. All States are involved to some degree in the notification process - most see this process as an opportunity to gather data necessary for the adoption of regulations which are appropriate for their State. Thus, a large portion of FY 86 Grant Funds are directed toward processing notification forms and setting up specific data management systems (see Life after Notification article.)

We contacted 8 States throughout the country to find out the status of their UST regulatory programs and their work plans for FY 86. Here is an overview of the UST programs in Arizona, Delaware, Kansas, Maryland, New Mexico, Oregon, Pennsylvania and South Carolina.

★ **Arizona** - Overall authorities addressing groundwater protection and storage and handling of flammable and non-flammable liquids are currently fragmented. Existing regulations, which are primarily corrective, fall within the jurisdictions of the Department of Health Services (DHS), the State Fire Marshal and Federal OSHA regulations for the workplace. In January 1986, the Department of Health Services will introduce draft UST legislation designed to bring Arizona's program in compliance with Federal RCRA requirements and to coordinate the State's regulation of an estimated 10,000 to 15,000 underground tanks. The new regulations will probably require that full program implementation be delegated to local jurisdiction (cities or counties) or in some instances to the State Fire Marshal. According to current plans, the State will handle such activities as program oversight, notification, remedial actions, and the establishment of standards.

William Wiley (602)257-2350

★ **Delaware** - The State's General Assembly passed a Delaware Underground Storage Tank Act on June 30, 1985 - only 30 days after it had been introduced - unpre-

cedented in Delaware as in most States. Implementation of the Act is well underway with a Tank Notification Program, a 3rd draft of technical regulations and a special subcommittee which is working with the Delaware Insurance Commissioner to look into the very perplexing problem of financial responsibility.

As in most States, Interim Prohibition is getting modest attention. Delaware has established a checklist which is used in responding to telephone notifications concerning the installation of new tanks (a State requirement which came into effect on September 10, 1985).

The Department of Natural Resources & Environmental Control (DNR&EC) is in the process of negotiating with the State Fire Marshal to implement a new tank inspection program. Under existing law, the Fire Marshal has this authority, but no resources. As part of its UST Grant application the State is requesting \$30,000 to be passed through to the Fire Marshal's office so he can hire a deputy fire marshal to conduct tank installation inspections.

The Department has conducted a series of tank seminars throughout the State in cooperation with the Delaware Petroleum Institute and the American Petroleum Institute. The seminars briefed tank owners on the generic problem, the Delaware law, financial liability/insurance issues and their obligations pertaining to Interim Prohibition.

The Department hopes that their program will be, for the most part, "self-regulated" since the potential liability and the virtual absence of liability insurance might persuade tank owners to be careful.

The petro-chemical industry has been cooperative and helpful in the State's program. So far, however, there has been an absence of cooperation from the chemical industry, but the State hopes that eventually the industry will appoint a representative to the LUST Committee.

Robert MacPherson (302)736-4860

★ **Kansas** - Because of numerous groundwater pollution incidents resulting from petroleum storage tank leaks, the Department of Health and Environment deter-

mined that to adequately protect groundwater aquifers, regulations should be implemented to control the installation, operation, leak detection and abandonment of petroleum tanks. Such regulations, Article 44, went into effect May 1, 1981. The regulations gave the Department the authority to force the responsible parties to take action necessary to stop leaks and begin clean-up operations.

Tanks storing substances other than petroleum products are not currently covered under Article 44. Information on tanks storing hazardous substances is now being compiled and will be computerized along with the petroleum tank data. The existing field inspection program will also be expanded to include old petroleum tanks and hazardous substances storage tanks.

Kansas has waited to update its UST regulations in anticipation of the Federal program. One of their new priorities will be the development of an installer's certification program.

Gary Blackburn (913)862-9360

★ **Maryland** - Since 1976 the Department of Natural Resources (DNR) has required permits for oil and other liquid hydrocarbon storage. According to these regulations, tanks must be constructed to minimum design standards, installed properly and operated and maintained in an environmentally sound manner.

The 1976 regulations were substantially rewritten over a two-year period and adopted in January of 1985. During the re-write process, the DNR worked with an Ad Hoc Committee on Oil Spills which was composed of representatives from various governmental agencies, oil distributors, gasoline retailers, petroleum wholesalers, and other tangential industry interests.

Regulations cover the design and operation of petroleum and liquid hydrocarbon tanks. NFPA standards are incorporated by reference. A specific ban on installation of non-cathodically protected bare steel tanks became effective March 15, 1985. Requirements for the monitoring of product discharge or leakage are also included, as well as provisions for the monitoring of content level, inventory loss re-

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porting, mandatory integrity testing for all tanks, and corrective action. Finally, the regulations require that all tanks taken out of service meet certain abandonment requirements.

The State has opted not to apply for FY 86 State Grants; instead, they are coordinating their Subtitle I RCRA requirements with Region III, EPA. At present Maryland's UST operating budget is maintained by a "special" fund made up of an annual fee on the industry.

The Governor has appointed the Office of Environmental Programs to receive the notifications and to coordinate all Subtitle I activities. The State has been actively informing the regulated community of its obligations under State and Federal Law.

Bernard Bigham (301)225-5649

★ **New Mexico** - UST's are currently regulated through the State Fire Code (citing NFPA-30) which regulates the installation, maintenance and closure of UST's and through Water Quality Control Commission Regulations which address discharges from UST's by setting water quality standards for surface and groundwaters. These water quality regulations require that leaks, spills and other discharges from UST's be reported to the State Environmental Improvement Division (EID) and that all environmental impacts be corrected. At present, the EID has no UST enabling legislation, but in January, 1987, the EID will submit a comprehensive legislative package. They are closely monitoring EPA's progress on regulation development.

Interim Prohibition violations are also violations of the State Fire Code and are, therefore, already handled by the State Fire Marshal. The EID also promotes Interim Prohibition through its public outreach efforts. The Division works with the Fire Marshal to monitor UST installations.

In New Mexico it is generally agreed by business, government and public representatives that groundwater contamination, especially by UST's, is an "insidious and chronic" problem. There is even general agreement among these groups over the causes and consequences of environmental contamination from UST's. Differences occur on questions of responsibility; who is responsible and who should pay the costs.

While the Federal UST grant will enable the State to fully launch the

"preventive arm" of their program, the EID still has major concerns about the "remedial arm" of their program. Since 90% of New Mexico's drinking water comes from groundwater, they cannot afford to contaminate their aquifers. A growing amount of staff time is devoted to emergency and remedial responses to LUST's and petroleum contamination incidents. The Division feels the Federal program "essentially ignores remediation". Presently the State has numerous cases of unaddressed contamination.

The EID is attempting to secure State funding for a small staff to be dedicated full-time to LUST's, but the chance of this is unlikely. New Mexico does have a small emergency fund which can provide limited remedial assistance. However, one large leak could effectively drain this fund. The Division is closely following the Federal Superfund reauthorization, hoping that LUST's will be included in this funding.

W. Mark Gruber (505)827-2933

★ **Oregon** - The Department of Environmental Quality (DEQ) regulates owners and operators of UST's containing petroleum products and CERCLA hazardous substances. Requirements for reporting spills and leaks had been limited to sections in the State's Hazardous Waste Management Rules and administrative rules of the State Fire Marshal. However, in 1985, new legislation was adopted which has provided expanded protection of public surface and groundwaters from spills and leaks of all regulated substances.

Under these laws, the State's estimated 30,000 owners and operators are assigned responsibility for spill and leak prevention, for reporting spills and leaks, for taking action to clean up spills and leaks, and for paying all costs of investigation, testing, preventing, reporting and cleaning up a spill or leak. The DEQ also has the authority to adopt a State-wide plan for reporting spills and leaks, to undertake investigations, to undertake tank and line testing, and to establish a procedure for the Department to recover investigation costs from owners and operators who have been responsible for a spill. DEQ personnel have authority to enter public and private property, to inspect suspected sources of leaks, to obtain and evaluate product inventories, and to require leak tests of storage facilities.

During FY 86 the DEQ will adopt administrative rules to implement these provisions. They will develop their rules and regulations so that they can incorporate the Federal program into the State program. The State program will be modified to be both consistent with EPA requirements and responsive to State issues and concerns. LUST funds will also go toward DEQ staff training and public awareness programs.

Kathy Futornick (503)229-5828

★ **Pennsylvania** - At present, the only regulations that apply directly to UST's are State Chapters on Flammable and Combustible Liquids which are enforced by the State Police, Fire Marshal Division. These regulations are inadequate to protect environmental degradation of surface water and groundwater.

The Department of Environmental Resources (DER) has authority, based on the State's Clean Stream Law, to respond to a UST release by implementing abatement activities. DER's current program is oriented toward pollution abatement rather than prevention. No legislation has been passed mandating the DER to develop UST regulations as a result of the 1984 RCRA Amendments. However, the Clean Stream Law is thought to provide adequate legislative authority to regulate UST's. Additional legislation may eventually be necessary to provide a broader financial authority.

At present, the DER is conducting a regulatory needs assessment on the control of underground storage systems. They are reviewing technology related to leak prevention, leak detection, tank construction, design, closure and corrective action. They are also examining potential regulatory approaches, program financing, staffing requirements and other related issues. This information will be used in developing UST regulations which should be compatible with those being developed by EPA. Until Federal requirements are final, no decision will be made on whether Pennsylvania will apply for primacy or develop a separate program.

Recently, the Governor decided to transfer the program regulating flammable and combustible liquids from the State Police to DER. DER will be responsible for reviewing all applications for above and below ground storage systems con-

taining flammable and combustible liquids, inspect the facilities during installation, issue approvals for installation, and place all appropriate information into a data management system. The integration of this program with the Federal UST program could result in a comprehensive State fire safety and groundwater control program. DER expects to begin implementing the program in early 1987.

John Osgood (717)783-3638

★ **South Carolina** - Underground Storage Tank Control Regulations (USTC) promulgated by the South Carolina Department of Health and Environmental Control (SCDHEC) became effective on May 24, 1985. The regulations are compatible with the Federal Subtitle I requirements on types of tanks and substances to be regulated. The regulations were submitted to Region IV for review in January 1985. The only Federal program area lacking in South Carolina's regulations is the requirement for maintaining evidence of financial responsibility for taking corrective action and compensating third parties for bodily injury and property damage resulting from UST leakage.

The SCDHEC plans to ensure compliance with Interim Prohibition by establishing a tank-permitting program beginning January 1, 1986. To obtain a tank permit, the tank owner must install a tank which meets interim prohibition standards and other more stringent design, construction, and installation requirements.

According to SCDHEC regulations, all owners of existing UST's must notify the State of the tank's existence by January 1, 1986. Owners of abandoned or temporarily out of service tanks have until May 8, 1986 to notify. ■

Suzanna Workman (803)758-5213

State Legislators to Receive Draft Model Legislation in January

Draft model legislation developed by the National Council of State Legislatures will be distributed to State Legislators in January. For copies contact:

Paul Doyle, NCSL, 1050 17th St.
Denver, Colorado 80265
(303)623-7800

Questions and Answers on Notification

EPA has received numerous UST questions on the HOTLINE. This issue of LUSTLINE addresses some of the questions which have been asked frequently on NOTIFICATION.

General Questions

Q. How does EPA respond to requests for the Notification Form?

A. EPA suggests that people contact the State for a form because the State may have an addendum or other requirements that EPA is not aware of. If a person insists on receiving a Federal form, it is sent out.

Q. How does EPA handle questions concerning the information requirements of the form?

A. EPA suggests that people contact States for answers.

Q. How does EPA plan to inform UST owners of their responsibility to notify?

A. EPA will assist States in getting the word out by mailing to Trade Associations, various UST informational brochures, fact sheets, etc.

Q. How will distribution and receipt of the forms to Indian Land work?

A. Regions will distribute forms directly to Indian Lands for submission back to the Regions. Regions will send the EPA form to all Indian reservations, even those located in States using State forms.

Ownership Questions

Q. Does tank owner have to notify if he purchased land with abandoned tanks? (Never used tanks and does not intend to use.)

A. If tank was in use after 1/1/74, then owner who abandoned tank after 1/1/74 must notify.

Q. Who notifies if tanks were abandoned before 1974?

A. Nobody has to notify, but EPA encourages notification.

Q. What if an owner that discontinued use of tanks before 11/8/84 is dead?

A. No one is required to notify. If it is suspected that a tank contains regulated substances, EPA encourages notification. Mark ownership uncertain.

Q. Who notifies in the event there is no clear evidence of sale or transfer; documentation has been lost or destroyed?

A. EPA encourages people with an interest in tanks to notify without necessarily admitting ownership.

Q. If a UST is in use after 11/8/84 but is removed from the ground prior to 5/8/86, does the owner have to notify?

A. No, 5/8/86 is the latest date UST's can be removed so that the tank is not subject to the UST notification requirements.

Q. Does the owner have to notify if the UST was taken out of operation and "closed" in accordance with local requirements? (Tank was left in the ground after 11/8/84.)

A. Yes, only tanks removed from the ground prior to 5/8/86 do not require reporting.

Q. If an owner leases his land to a company which installs UST's, who must notify; the owner of the land or the owner of the tanks?

A. The owner of the tanks.

Q. If an owner knows his land has UST's on it but doesn't know the number or location of the tanks, is the owner required to locate his tanks? What are the penalties if he does not?

A. The owner must report all UST's in the facility. Penalty for non-reporting is \$10,000 for each tank for which notification is not provided.

Q. If a UST is in use on 11/8/84 and stores petroleum and is then emptied but not storing anything on 5/8/86, is notification required?

A. Yes, the current owner is responsible to provide notification even if the tank was permanently taken out of use after November 8, 1984, and even if the current owner was not the person who took the tank out of use.

Q. If a UST is in use on 11/8/84 and stores petroleum and is then emptied and refilled with heating oil for consumptive use on the premises

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Testing Tanks For Leaks

Perhaps no procedure is so widely relied upon yet so poorly understood as testing of underground storage tanks. Most existing or proposed State and local regulations require tank testing according to a variety of set schedules, and tank owners use it as a means of detecting leaks. Nearly a dozen volumetric test methods have been identified by EPA so far, along with other types of tests. Yet, until recently, very little effort has been made to determine the accuracy and precision of any of these procedures. As a result of its recently completed national survey, EPA has found that manufacturers' claims of performance for their tank testing methods are largely unsubstantiated. This article will describe what information and data are lacking and discuss what the Environmental Protection Agency (EPA) is doing to understand tank behavior and characterize the performance of tank testing methods.

What is a Precision Test?

There are many ways to identify releases from underground storage tanks. These can generally be classified as volumetric tests and non-volumetric tests. Volumetric tests are sometimes called "precision tests".

The National Fire Protection Association (NFPA) publishes a recommended practice known as NFPA 329, **Underground Leakage of Flammable and Combustible Liquids**. NFPA 329 defines precision test as "any test that takes into consideration the temperature coefficient of expansion of the product being tested as related to any temperature change during the test, and is capable of detecting a loss of 0.05 gallons per hour." While this definition may sound confusing to some, be assured that in application, tank testing is far more complicated than this statement makes it appear. In fact, the coefficient of thermal expansion and temperature change during the test are only two of many variables that affect test results.

Although many testers claim to meet the NFPA criteria of being able to detect leaks as small as 0.05 gallons per hour, no published data exist to demonstrate this claim. Many of these claims appear to be based on the ability to detect a product level change equivalent to this leakage rate. Unfortunately, it appears that while many tests can

reliably detect very small level changes, the methods for measuring and removing the effects of "noise" have not been sufficiently evaluated. For example, although most tests include a procedure for measuring and compensating for temperature changes in the liquid in the tank, it is uncertain how well those techniques work. Preliminary results from evaluations done by EPA's Office of Toxic Substances (OTS) indicate that some tests do not account for all variables that affect the test result, and that some compensation techniques can add to the noise.

Noise in the Tank

The capability of any test method to accurately detect the presence of a leak is affected by a number of variables. These variables, and others, constitute "noise" which can interfere with the detection of an actual leak. The most important of these include temperature changes, tank deformations, evaporation and condensation, and vapor pockets. Each of these factors can cause the product in the tank to expand or contract at rates that greatly exceed the leak rate the tester is trying to detect. Thus, these effects can make it appear as if a tank is leaking, or they can mask a leak. For example, if the temperature of the gasoline in an 8,000-gallon tank were to increase by 0.01° F in one hour, the volume of the gasoline would increase by 0.05 gallons. If the tank was leaking at a rate of 0.05 gallons per hour, the product level would not change, and no leak would be detected.

Pockets of air or product vapor trapped in the tank can also significantly affect test results. Changes in product temperature and atmospheric pressure will change the size of a vapor pocket, causing a corresponding change in liquid level. These pockets can form in the high end of a tank that is not level, in the top of a manway, or at the top of a drop tube in the tank. The vapor pocket problem is important because good installation practices dictate that the tank be sloped toward the fill pipe.

Tank deformations also cause changes in volume that can affect leak detection. Neither steel nor fiberglass-reinforced plastic (FRP) tanks are completely rigid structures. They flex slightly as liquid level within the tank changes. When the tank is filled, it may ex-

pand over a period of several hours. This change in volume, though slight relative to the total tank volume, is more than sufficient to affect the accuracy of a test because, like temperature and air pocket effects, it can mask, mimic, or enhance a leak.

Evaporation and condensation during a test can cause gains or losses of product that can appear as leaks into or out of the tank. When a test requires that product be exposed to the atmosphere, such as in a standpipe, it risks direct loss of product by evaporation. In addition, methods which test partially filled tanks expose a large surface area to the effects of evaporation and condensation.

Eliminating "Noise"

Accurately detecting a leak in an underground storage tank depends on understanding the sources of the noise and eliminating its effects. Two components are involved in distinguishing leaks from noise: the technology used and the people who use it. The first component depends on the equipment, test procedures, correct temperature measurement and compensation techniques, and identification and mitigation of other noise sources. The second component depends on the proper use of the first. Any test method can only be as good as the people who use it. Therefore, a competent operator may be more important than the technology because important environmental and business decisions are based on the results.

A more detailed discussion of each component is presented below.

Technology: Most available tank testing methods began with equipment capable of measuring very small changes in fluid level. Experience gained thus far indicates that most precision testing equipment is capable of doing this accurately. The equipment is usually not the culprit in an unreliable test as long as it is routinely calibrated and checked to ensure that accurate readings are made.

The step-by-step procedures followed in conducting a test affect the quantity and quality of the data collected as well as the outcome of the test. Correct results can only be obtained by following set procedures. The following must be performed correctly: characterization of the system, including identification and orientation of the tank and all associated lines; location of temperature sensors in the tank; duration of the test; and proper protection of the equipment from weather.

If any test requires that the tank be filled and does not involve thorough mixing of the tank contents, sufficient time must be allowed after filling to allow the conditions within the tank to stabilize. The duration of the test must be sufficient to provide enough information to characterize the tank behavior and to estimate the level of "noise" in the tank.

Measures should be taken to understand the pattern of the "noise" so that their effects can be subtracted from the baseline condition.

Because compensation for temperature effects usually involves estimates based on readings at one or a few locations in the tank, it introduces some level of uncertainty into the results. Some estimation techniques now used do not adequately compensate for temperature changes, and, therefore, over- or underestimate the leak rate. In some cases, the techniques actually introduce more "noise" than exists.

Operators: Any procedure involving a human being is subject to error. This is certainly true of testing. It is critical that the technicians performing the test understand the test objectives as well as the procedures to be followed. Cutting corners such as allowing insufficient time for tank stabilization, shortening the test duration, or failing to recognize the need to retest can seriously effect test accuracy. All test methods are subject to these problems. The Agency has found that a test method can be very accurate when conducted by competent operators and very inaccurate when conducted otherwise.

What is EPA Doing About It?

Now that we have identified so many problems associated with tank testing, what is EPA doing to improve the situation? The Agency has already conducted one study involving tank testing and is preparing to start another.

The first study was the national survey of leaking underground storage tanks conducted by OTS. The objective of this study was to determine the percentage of underground tanks containing motor fuel in the United States which are now leaking. As part of this survey, over 550 tanks were tested. Prior to conducting the survey, however, it was necessary for OTS to define the performance characteristics of a method to be used in the survey. After screening several available methods, one was selected and extensive data were generated on the performance of

Questions & Answers *Cont'd*

where stored (it is storing heating oil on 5/8/86), is notification required?

- A. Yes, the current owner would notify because the UST held regulated substances after 11/8/84.
- Q. If a person owns a UST storing toluene on 12/8/84 and he notifies the State agency on 2/8/85, and then he sells the tank and the new owner empties it and replaces the substance with another hazardous substance, does the new owner have to notify because the tank is storing a different substance?**
- A. Yes, he becomes an owner of a tank storing a regulated substance. We recognize that there will be double reporting.
- Q. If an owner sells a tank on 12/8/85 and the new owner discontinues use of the tank, who notifies?**
- A. New owner would report that the tank is no longer in operation. (It is either temporarily out of use or permanently out of use. No one notifies if the tank is pulled out of the ground prior to 5/8/86.)
- Q. What if an owner owns land but isn't sure if he owns the tank?**
- A. IF IN DOUBT, NOTIFY!
- Q. When tanks are bought or sold, does the buyer or seller submit notification?**
- A. Whoever owns the tank on 5/8/86 would notify. If both the buyer and seller want to notify, we will accept both notifications. (If you sell tank before 5/8/86 you may want to notify because you may not know when transfer will take place.)
- Q. If a person owns a UST storing petroleum and he notifies the State agency on 12/8/85, then he brings a new tank into use on 1/8/86, does he have to notify for this new tank?**
- A. Yes, the owner must notify by 5/8/86 for this new tank. All tanks at a facility must be reported.

the method. Several modifications to the method were made prior to conducting the survey. Information and data obtained during the survey will be used in designing the next study to be conducted by EPA's Office of Research and Development at Edison, New Jersey.

The objectives of this second project are to evaluate tank behavior and to develop a procedure for evaluating tank testing methods. Current plans are to install two 8,000-gallon storage tanks along with their ancillary piping. These tanks will then be filled with various fluids (starting with gasoline and diesel fuel). The behavior of the fluid within the tank will then be studied using highly sensitive equipment.

The result of this study will be a computer data base of "noises" which normally exist within tanks. This data will allow us to predict the behavior of the liquid within the tank under various conditions. We can then compare our analysis techniques to those used by various tank testers. Several tank testing companies will then be invited to evaluate their systems at the laboratory. Any tester whose noise compensation technique meets the criteria established from the "noise"

EPA has recently completed its study, **Underground Leak Detection Methods: A State-of-the-Art Review**, by Shahzad Niaki and John A. Broschious. For ordering information contact: ORD Publications-CERI US Environmental Protection Agency Cincinnati, OH 45268 (513)569-7562

data base will be able to apply their test to the tanks. Leaks will be simulated in the tanks, and the tester's performance will be evaluated. Where appropriate, changes in the test procedures will be suggested to improve accuracy. It is hoped that preliminary results will be available in the Spring of 1986.

Until the completion of the research projects, tank testing will continue to be a somewhat uncertain science. Exact leak rates are difficult to measure and some errors are certainly made in simply declaring a tank tight or leaking. However, there is a better chance to detect a leak if the tank is tested than if it is not. Anyone relying on tank testing to detect leaks would be well advised to institute tight management practices to complement the testing, such as daily inventory recordkeeping and reconciliation as

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R.I. AND N.J. PLAN LOW INTEREST LOANS FOR TANK REPLACEMENT

The Rhode Island Legislature recently passed a \$1.5 million Bond to initiate a revolving low interest loan program to replace leaking USTs. The Department of Environmental Management has been authorized to develop these rules which could also take into account loans for tank closures. The DEM is currently drafting these regulations which, when completed, will set a maximum loan figure (around \$6,000) and specify eligibility.

Rhode Island was the first state in New England to adopt regulations for both petroleum and chemical USTs.

In New Jersey, companion legislation to the proposed UST legislation will establish a dedicated fund from the general State treasury to establish a low interest loan program for those affected by the tank law. ■

Tank Testing *Cont'd*

well as routine maintenance of pumps, lines and fill pipes, and inspections of all visible equipment. Remember, the fact that the test result is negative does **not** mean the tank is not leaking. At best, it means the tank is leaking at a rate below the detectable limit. This small leak may grow larger or may remain small for a long period. In either case, a great deal of environmental damage can be done. EPA will strive to help tank owners and

12

Life After Notification *Cont'd.*

sponding to incomplete surveys returned and for no-surveys returned. New Mexico's computer program will allow staff to sort for selected variables within the data base. Their goal is to perform risk assessments for critical hydrologic zones using such tank information as age, tank and piping construction material, corrosion protection, and type of substance stored. This information will be compared with environmental data such as depth to groundwater, groundwater quality use, soil corrosivity, etc. From this analysis the staff hopes to develop a risk assessment scheme for each tank to use in their regulatory development process. Through data processing, Delaware hopes to have the capability to check the number of tanks at certain ages to ascertain the impact of imposing retrofit, replacement or testing requirements at given in-ground age periods. Moreover, they are asking for groundwater-related information on notification forms for use in determining the relative pollution potential of a leak at a given facility. In this way, they hope to develop a priority plan for response and clean-up. ■

operators determine the best ways to test tanks for leaks in addition to the best ways to prevent leaks in the first place. ■

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MAINE GEOLOGIST WINS EUROPEAN UST STUDY AWARD

Marcel Moreau of Maine's Department of Environmental Protection (DEP) has become a familiar name in LUST circles throughout the country because of his contribution to our understanding of environmental problems created by underground storage of petroleum products. Moreau, a geologist by training, has been awarded a fellowship by the German Marshall Fund of the United States to study European approaches to the leaking underground storage tank (LUST) problem.

Moreau will study the regulatory strategies and storage tank technologies which have been used, successfully, to deal with the problem in countries such as Germany and Sweden. He will also examine strategies and technologies being considered by countries presently addressing the problem.

Moreau is with DEP's Bureau of Oil and Hazardous Wastes and has been documenting and investigating UST problems since 1983. His work has also expanded to reviewing state-of-the-art UST technology and remedial action technology including containment and aquifer restoration.

Marcel has been active in the development of public education and outreach programs to create public awareness in support of resolving Maine's UST problem. We hope to share some of his European findings in the next issue of LUSTLINE. ■

LUSTLINE

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