

L.U.S.T.LINE



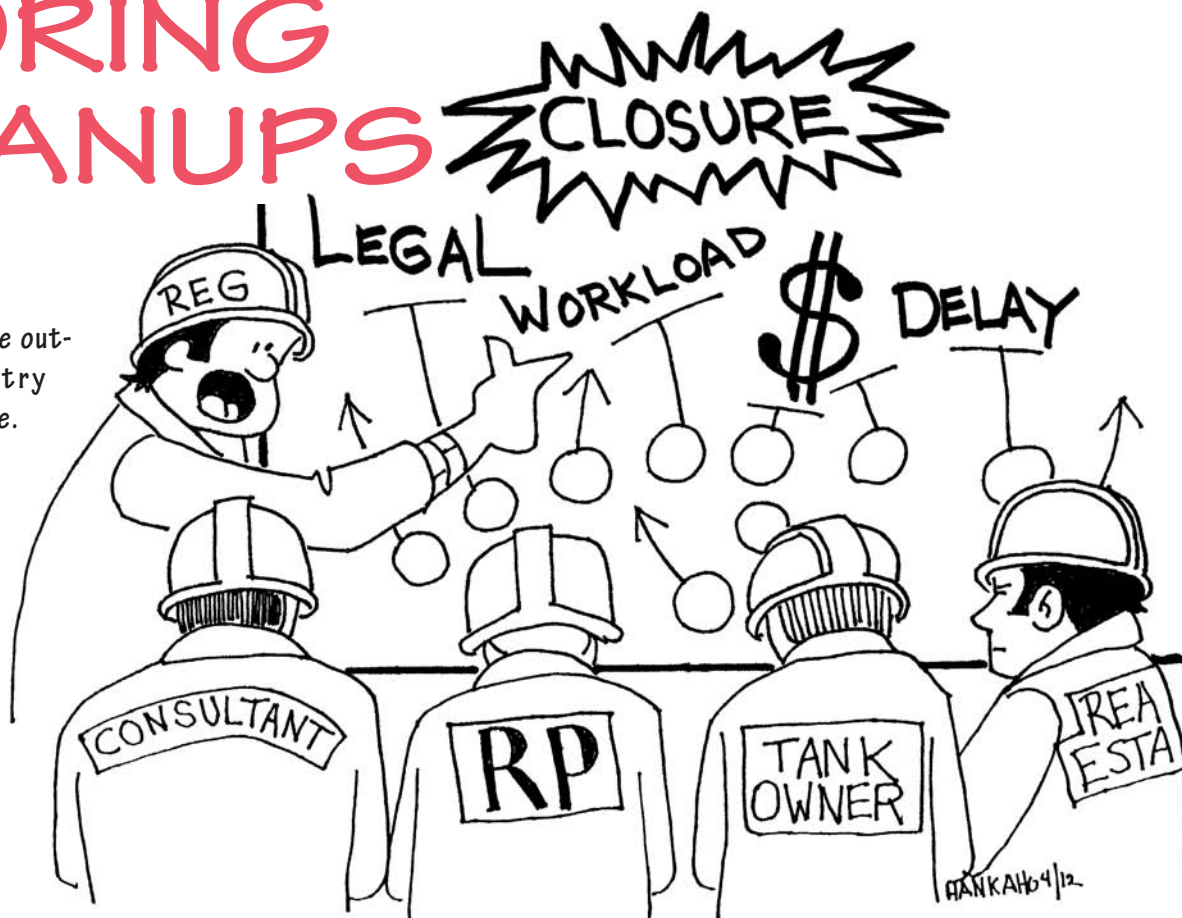
A Report On Federal & State Programs To Control Leaking Underground Storage Tanks

SCORING CLEANUPS

by Dorothy Malaier

It's hard to beat the out-and-out pageantry of a football game.

From the recruitment of players to the execution of the plays, the game of football is filled with excitement. Watching a team playing together to accomplish the goal of winning the game has become one of America's favorite pastimes.



But have you ever thought how the game of football can be compared to our leaking underground storage tank (LUST) cleanups? No? Well, for me, being from the South where Southeastern Conference (SEC) football can consume your life in the fall of every year (and hopefully in January too!), it's not hard to think about life in terms of making field goals and scoring touchdowns.

Managing UST cleanups is a big part of my life, and over the years I've realized that cleanups and football are not really that different. I am sure many of us in the LUST programs sometimes feel like we're running with the ball. Sometimes we "drop the ball," and sometimes we seem to be getting nowhere because of the virtual 300-pound obstacle in our way. In football, the goal of the game is to

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■ Scoring Cleanups *from page 1*

score more points than your opponent by running, passing, or kicking the football over the goal line. With LUST cleanups, the goal is to complete the cleanup—the goal line. How often have you felt like you are losing yards or getting sacked when a technology doesn't work or when you are overwhelmed with all the work there is to do in our program?

Just like a football game, a LUST cleanup involves a variety of players. Let me explain...player by player.

OFFENSIVE

Every good team needs a strong offense. So let's say, our offensive players are the cleanup contractors. They are given the ball by the responsible party (RP) or the state regulatory agency. The offense needs to take that cleanup to the cleanup goal. Sounds simple, but an equally strong defensive line may prove to be a challenge for even the best offense.



L.U.S.T.Line

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Tank owners can be part of the offensive line. The cleanup is their legal responsibility and they need to be in the huddle hearing the plays and working with the other offensive players to get the ball headed in the right direction.

Real estate developers and realtors are likely receivers. They want to have everyone pass them the ball so that they can score the points by selling or redeveloping the property. When we can clean up a site, everyone wins!

DEFENSIVE

Football requires both offensive and defensive players. For every good offensive play, there are defensive "players" on the field who try to block the offense from getting to the goal. Here are some of our key defensive players:

- **Recalcitrant Chemicals.** These tough guys try to block the progress of the ball by not responding to the cleanup technology chosen for the site. They often require other players to come off the bench after the starters are worn out.
- **Delays in Permitting.** While permits are necessary for remediation and waste management, they can cause the offense to stumble and experience game delays. Being too long in the permitting huddle can cause game delays, and violations of the permit can create more than just a five-yard penalty.
- **Legal Issues.** These players work hard and can come out of nowhere to trip you up just when you thought progress was being made. They run the "denied access" and "third-party lawsuit" plays.
- **Lack of Funding.** This defensive end can stop the play and even sack the "quarter" back. No money? No work! We've got to try to have this defensive player sit on the bench!
- **Geology.** A good stiff clay or lack of adequate subsurface data can stop forward motion during most games...I mean cleanups. These guys can cause the game

to be extended into overtime if you don't watch out!

- **Heavy Staff Workloads.** It's hard to get into the end zone when you are tired and overworked. You may need to bring in the second string to help our starters work through all the plays we face. Maybe you need to be sure that everyone understands the process, plays their part, and keeps the ball moving toward the field goal.

THE OFFICIALS

Every good sport needs rules and officials to make sure everyone is playing the game according to the rules. This is where regulators come in.

Penalties can be charged when a player "jumps off-sides" or, as we say in cleanup, "has a release." How about a delay of game penalty? Did your offense take too long to perform the investigation, or are we in year five of the "two-year cleanup" plan? Should the flag be thrown when these actions happen in our cleanup game?

FANS

Let's look beyond the game itself, and see the other important parts of a good football game. How about the fans?

LUST cleanups have a variety of fans that cheer on the offense to get a fast cleanup—bankers, property owners, adjacent property owners, and the community. These parties all want the cleanups to be performed quickly and effectively so they can breathe a collective sigh of relief.

CHEERLEADERS AND MARCHING BANDS

Enthusiastic cheerleaders and a great marching band can get that adrenaline going. Do you have supportive management in your agency to "cheer" you on and make sure everyone is marching to the same tune?

SELECTION OF PLAYS

From the start of the investigation to the abandonment of the monitoring wells, the selection of your cleanup plays will decide whether the drive is a long one or whether you can

close out the release with a hurry-up offense.

The selection of natural attenuation might be the more cost-effective choice, but it could take a long drive before goals are met. The decision of cost effectiveness over timeliness is played out frequently in cleanup programs around the country. Most cleanups involve a series of plays that incorporate different strategies for cleanup—maybe a first-down play to excavate soil, a series of multiphase extraction plays, finished off with some chemical oxidation, for example. Decisions for the next play need to be determined by experienced players (staff) who know what it takes to reach the goal line.

ENDGAME

When time is up and the last play is made, the only good “score” or closure is one that can’t be overturned. Are we sure we investigated the site well enough? Did we address the areas of risk? Can we feel confident the site poses no unacceptable risk to future landowners? Hopefully, if the game was played well and the final whistle is blown, we will have scored many touchdowns and our cleanup backlogs will be reduced.

So, the next time you enter your office, think of it as entering a giant stadium where you can design the plays and coordinate the offense to clean up your state’s UST releases. With every cleanup completed, you can hear the crowd roar!

Roll Tide! ■

Dorothy Malaier is a lifelong Crimson Tide football fan and Corrective Action Supervisor for the Alabama Department of Environmental Management. She can be reached at DSM@adem.state.al.us.

E15 Rumbblings.....

USEPA Approves First Applications for E15 Registration

USEPA approved the first applications for registration of ethanol for use in making gasoline that contains up to 15 percent ethanol—known as E15. Ethanol is a renewable fuel that has up to this point been produced and sold in gasoline at a 10 percent concentration in most areas of the country. Registration of ethanol to make E15 is a significant step toward its production, sale, and use in model year 2001 and newer gasoline-fueled cars and light trucks. This action follows an extensive technical review by USEPA as required by law.

Registration is a prerequisite to introducing E15 into the marketplace. Before it can be sold, manufacturers must first take additional measures to help ensure retail stations and other gasoline distributors understand and implement labeling rules and other E15-related requirements. USEPA is not requiring the use or sale of E15.

After extensive vehicle testing by DOE and other organizations, USEPA issued two partial waivers raising the allowable ethanol volume to 15 percent for use in model year 2001 and newer cars and light trucks. E15 is not permitted for use in motor vehicles built prior to 2001 model year and in off-road vehicles and equipment such as boats and lawn and garden equipment. Gas pumps dispensing E15 must be clearly labeled so consumers can make the right choice. For more information, go to www.epa.gov/otaq/regs/fuels/additive/e15/.

The “Domestic Fuels Protection Act of 2012”?

As a heads-up, there is currently a House Bill (H.R. 4345) specifically designed to “provide liability protection for claims based on the design, manufacture, sale, offer for sale, introduction into commerce, or use of certain fuels and fuel additives, and for other purposes.” This blanket liability waiver is in response to fuel retailer concerns about liability arising from potential compatibility problems associated with the use of E15 in on- and off-road motor vehicles and equipment, not to mention the integrity of the UST system itself.

The bill would also assign USEPA responsibility for establishing regulations that would set standards for determining whether an underground storage tank system or associated dispensing equipment (not currently regulated in the federal UST rule) is compatible with a fuel or fuel additive. USEPA’s current compatibility guidelines essentially do this, except for the dispenser part.

We’ll keep you posted.

API Report Gives Thumbs Down on E15

To add to the E15 fray, an American Petroleum Institute-funded report, *A Comprehensive Analysis of Current Research on E15 Dispensing Component Compatibility*, by Larry Gregory Consulting, LLC, was just released. It reviews several research papers published on the effects of increasing the ethanol blend ratio to E15 from the current E10 standard. After summarizing with a list of risks to the tank owner, the report concluded that the only alternative is to not store E15 at the facility. A copy of the report is available at <http://www.api.org/policy-and-issues/policy-items/alternatives/analysis-of-current-research-on-e15-dispensing-component-compatibility.aspx>. ■

Vapor Recovery Systems to Be Phased Out

USEPA’s Air Office has determined that vapor recovery systems used at gas station pumps to capture harmful gasoline vapors while refueling cars can be phased out. Modern vehicles are equipped to capture those emissions. Beginning later this year, states may begin the process of phasing out vapor recovery systems since approximately 70 percent of all vehicles are equipped with on-board systems that capture these vapors. This final rule will ensure that air quality and public health are protected while potentially saving the approximately 31,000 affected gas stations located in mostly urban areas more than \$3,000 each year when fully implemented.

Since 1994, gas stations in areas that do not meet certain air quality standards have been required to use gasoline vapor recovery systems. However, as required by the Clean Air Act, automobile manufacturers began installing onboard refueling vapor recovery (ORVR) technologies in 1998, making gas stations’ systems increasingly redundant. ■

A Message from Carolyn Hoskinson

Director, USEPA's Office of Underground Storage Tanks

How Certain Is FR?

USEPA's Quest to Follow That Star



Few people find underground storage tank (UST) financial responsibility (FR) a fascinating discussion topic. There are so few, in fact, that I think we all know each other. Yet, I'd be hard pressed to think of a subject more essential to a successful leaking underground storage tank (LUST) program than ensuring there are resources available to pay for cleanups. Fortunately, the UST program's founding fathers recognized the importance of financial responsibility. In the mid-1980s, lawmakers amended Subtitle I of the Solid Waste Disposal Act and directed the U.S. Environmental Protection Agency (USEPA) to develop financial responsibility regulations for UST owners and operators. Congress wanted UST owners and operators to be able to show that they have the financial resources to clean up a site if a release occurs, correct environmental damage, and compensate third parties for injury to their property or themselves. In 1988, USEPA promulgated the final UST FR regulation.

Like most aspects of the tanks program, the federal FR regulation provides UST owners and operators with compliance options such as obtaining insurance coverage; demonstrating self-insurance using a financial test; obtaining corporate guarantees, surety bonds, or letters of credit; or relying on state financial assurance funds (a.k.a. state funds), as well as a host of options for local governments. Currently, UST owners primarily use insurance or state funds as their financial responsibility mechanism.

So, how was this supposed to work? In an ideal world, FR would mean that the moment a release is confirmed, the money is in hand to immediately begin to address the problem. Also, ideally, the resources are sufficient to fully address the cleanup needs as well as compensate third parties. When USEPA drafted the FR regulation and approved each individual state fund as an approved FR mechanism, we did our best to ensure this ideal was met. Of course, we all know that very few things in life work perfectly and as envisioned.

Over the years, USEPA has heard anecdotally that insurance companies were denying claims, leaving tank owners without funding for their cleanups. In addition, we've worked with different states whose funds weren't adequately funded to meet their obligations. Most recently, USEPA has been working with Connecticut, whose state legislature severely reduced funding for its state fund. As I write this article, that situation is continuing to unfold, and it is too soon to predict how Connecticut's efforts to resolve the problem will ultimately turn out.

To address the concerns we heard and experienced, USEPA recently issued a study on UST insurance, as well as guidance for USEPA regions reviewing state funds. We designed both of these documents to help enhance our dialogue on FR and better ensure funding is available to pay for cleanups.

UST Insurance Study

To investigate and address concerns we heard about UST insurance, USEPA studied the effectiveness of UST insurance as an FR mechanism. More broadly, we studied whether the current UST insurance structure provides owners and operators with the financial responsibility USEPA originally intended. Our study, issued in January 2012, summarizes results of our UST insurance policy analysis and data collection effort; identifies certain areas of concern; and discusses potential next steps. You can access the insurance study at www.epa.gov/oust/pubs/insurancestudy.htm.

The study findings are inconclusive as to whether UST insurance is effective as an FR mechanism. On one hand, the analysis of UST insurance policy language revealed certain definitions, terms, and conditions that could pose coverage and claim challenges for UST owners and operators. Furthermore, the litigation review suggests that UST pollution insurance policies do not always respond in a timely manner to provide financing for remediating releases from regulated USTs. Yet the policies purchased by owners and operators generally complied with the federal UST FR regulation. It also does not appear that insurance carriers are excessively or dismissively denying claim payments.

Nonetheless, USEPA is aware of individual circumstances where owners and operators feel their insurance carriers are inappropriately denying coverage. Moreover, even though this study identified several issues that may hinder the effectiveness of UST insurance policies to provide prompt financing of releases, it is still unclear to what extent UST insurance as an FR mechanism has led to unremediated releases or stalled remediation. Nevertheless, we acknowledge this study identified certain aspects of UST insurance that may be at odds with USEPA's ideal of how and when an FR mechanism should respond to releases.

USEPA presented several ideas in the paper to foster a robust discussion of next steps:

Educate Owners and Operators about UST Pollution Insurance. Possible strategies include educating owners and operators about: UST insurance; compliance with FR insurance requirements; specific policy provisions to which they should pay particular attention; and recommended practices that may reduce the chance of complications when filing claims with their insurance carriers (e.g., reporting releases as early as possible, or conducting a site assessment prior to temporarily closing their UST systems).

Collect Additional Data. As a potential next step, USEPA would like to work with interested parties to identify additional sources of information that could provide more insight into insurance issues. We would also be glad to

work with interested parties who would like to share, provide, or develop data that could further assist us in our evaluation.

Revise Existing Federal UST FR Regulation. Our analysis revealed UST insurance policy language that, while permitted under the federal UST FR regulation, may limit coverage provided by UST insurance. One way to remove or restrict use of this policy language is to amend the current regulation and place additional requirements on the use of UST insurance as an FR mechanism. The paper presents for discussion purposes several potential revisions to the current regulation. One critical consideration is the impact of any potential change on the availability and affordability of UST insurance to owners and operators.

Through the ideas presented in the paper or through other suggestions, USEPA will work with owners and operators, state and tribal regulators, insurance carriers, and other stakeholders to examine possible improvements to the UST FR program. To learn more about USEPA's efforts regarding insurance or provide feedback regarding UST insurance and FR issues, contact Cho-Yi Kwan (kwan.choyi@epa.gov or 703-347-8908).

State Fund Soundness Guidance

In February 2012, USEPA issued guidance for regional office review of state funds. This guidance provides USEPA regional UST programs with recommended procedures and factors to consider for monitoring the soundness of state funds. The goal of the guidance is to help ensure the adequacy of state funds. You can access the guidance at www.epa.gov/oust/states/state-fund-soundness-guidance1-26-2012.pdf.

I can think of three reasons USEPA's meaningful and systematic oversight of state funds is essential—maybe you know more!

1. State funds finance most UST cleanups in the United States. For that reason alone, it is essential that we ensure these state funds are and will be sufficiently funded to continue this impressive track record.
2. In order to serve as a legal FR mechanism for tank owners to use in complying with the federal regulation requiring owners to have FR, individual state funds received approval from USEPA. That approval was based on the funds meeting certain criteria. USEPA must ensure that as the years go by, changes to the funds do not later bring the funds out of compliance with those approval criteria.

3. Last and perhaps most important, we found several instances where our oversight and identification of potential concerns enabled USEPA and the state to work together to secure additional resources for the fund to boost its soundness.

In our February 2012 guidance, we recognized two things that make this oversight process challenging:

1. USEPA regional staff generally have environmental, not financial, backgrounds. We developed an oversight process that does not require the regional staff to perform complex financial analysis they neither have the experience nor training for.
2. Of the 36 active state funds—which are rather like snowflakes and my children's personalities—no two are identical. In fact, in many cases they are really quite different. We believe our guidance provides enough structure to make oversight meaningful, yet flexible enough to account for state-specific situations.

So what difference will a new guidance make? USEPA has had state fund oversight guidance since 1994, yet our implementation of that guidance has not been as meaningful, complete, and systematic as it could be. Along with issuing the new guidance, we are recommitting ourselves to the importance of truly implementing this review as a high-priority annual process. Currently, we are working with five states and their USEPA regions to test a state fund data form and data evaluation workbook, both of which will help regions implement the guidance. We are now evaluating the results of the tests, as well as modifying the data form and workbook based on what we found. We will be updating these tools within the next few months, and all USEPA regions will review all of their states' active funds this autumn and annually thereafter. To learn more about our state fund guidance, contact Bill Foskett (foskett.william@epa.gov or 703-603-7153).

The Mission Continues

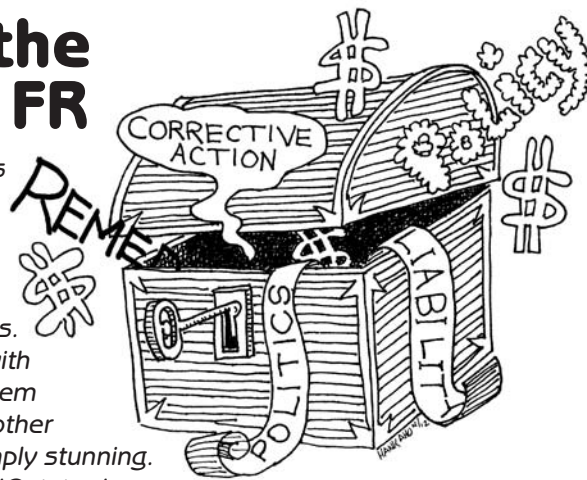
I'll be the first to admit, we still have a lot of work to do. We're not alone. I'm not aware of a single environmental program that has completely solved financial responsibility. What I am absolutely sure of is that it is vitally important, but extremely complex and challenging. So what do we do when a problem is huge and tough? It's just like the question, "How do you climb a mountain?" The answer is, "One step at a time." ■

FINANCIAL RESPONSIBILITY RESOURCES

- **Insurance for USTs Web Page:** www.epa.gov/oust/ustsystem/insurance.htm provides links to:
 - USEPA's study on the effectiveness of UST insurance as a financial responsibility mechanism
 - ASTSWMO's guide to assist owners and operators when purchasing UST insurance
 - USEPA's list of known insurance providers for UST owners and operators
- **State UST Financial Assurance Web Page:** www.epa.gov/oust/states/fndstatus.htm provides:
 - Status of state UST financial assurance funds
 - USEPA's guidance for regional office review of state underground storage tank financial assurance funds
- **Financial Responsibility for Underground Storage Tanks: A Reference Manual:** www.epa.gov/swrust1/pubs/frustman.htm provides UST inspections with the restrictions, limitations, and requirements of each financial responsibility mechanism provided in the federal UST regulations.
- **Facts About Financial Responsibility for Owners and Operators:** www.epa.gov/oust/ustsystem/finresp.htm provides an overview about financial responsibility.

Unlocking the Mystery of FR

A new column by Jill Williams Hall, Senior Planner with the Delaware Department of Natural Resources and Environmental Control, discussing FR-related matters. Her insight and experience with matters of UST and AST system Financial Responsibility and other UST-related miscellany is simply stunning. She can be reached at jill.hall@state.de.us.



How Certain Is FR? The Insurance Perspective

State Fund, Insurance, Self-Insurance, Guarantee, Letter of Credit. What do these terms have in common? They are all acceptable mechanisms for showing proof of financial responsibility (FR) as required by the federal UST regulations. But once an UST owner/operator has shown the state inspector a piece of paper that shows compliance with the FR regulation what must the FR mechanism actually do? To understand the purpose of FR one must take a trip back in time to October 1988 when the FR requirements were published in the *Federal Register*.

The program objectives for the final FR rules state that:

The financial responsibility program for petroleum USTs must require adequate and reliable financial assurance for the costs of UST releases, based on the following considerations:

- (1) *The certainty that funds will be available;*
- (2) *The sufficiency of funds to cover the costs of releases; and*
- (3) *The availability of funds for corrective action and third-party liability.*

So how well do the allowable mechanisms fulfill the intent of the requirements? For any mechanism the answer lies somewhere between 0 and 100 percent. By far the most widely utilized FR mechanisms are state funds and insurance. For states without a state fund (about a quarter of the states), insurance is the most widely used form of FR and possi-

bly the least well understood. UST insurance is an alien being to most of us, with its own language and rules, and by nature we humans tend to be afraid of things we don't understand. To unlock the mystery of insurance and leave our fears behind we must learn its language and honor its rules. With this knowledge, the certainty that insurance will fulfill the intent of the UST regulations rises significantly.

Does Insurance Fulfill Regulatory Criteria?

Looking at the criteria listed above, #2 and #3 are the easiest to answer regarding fulfillment of FR. Just as USTs are regulated by state and federal environmental agencies, insurance companies are subject to state and federal insurance regulations. Therefore we can safely assume that through regulation, insurance companies must be able to show proof that they have a bank account large enough to pay claims. Thus we probably need not concern ourselves with the issues of compliance with those two criteria.

As for criteria #1—certainty that funds will be available—we are faced with the question of “how certain is certain?” We have all heard the horror stories of how “insurance never pays” or “the first three answers to any insurance claim are ‘no, no and no.’” So where is the problem? Or better yet, is there a legitimate problem? The answer is not a simple “yes” or “no.”

The *Federal Register* publishing the final FR rule (Vol. 53, No. 207) states that in specifying certain pol-

icy conditions USEPA attempted to meet two objectives: (1) the need to ensure that insurance coverage will provide the same level of protection as other mechanisms; and (2) the need to preserve flexibility in policy specifications to allow insurers to develop acceptable policies and to avoid unnecessarily restricting the availability of insurance.

In the final rule, USEPA deliberately set forth *minimal* policy language, therefore tank insurance policies come in a variety of flavors, all of which meet the regulations but do not provide exactly the same coverage. Insurance is a contract between the insured and the insurance company and therefore the policy language and compliance with the rules it sets forth is paramount in determining the level of certainty that funds will be available.

In December 2011, USEPA published a document, *EPA Study on the Effectiveness of UST Insurance as a Financial Responsibility (FR) Mechanism*. The study states: “What has evolved over time and exists today is an assortment of UST insurance policies purchased by owners and operators which, depending on a lengthy set of circumstances and contingencies, *may* cover remediation and third-party expenses arising out of releases from regulated USTs.”

So what does one do with a statement like that? Deliberate use of the word “may” implies there must also be a “may not.” After studying 25 policies issued by 12 different carriers, USEPA concluded that the policies did comply with the regulations. But does that translate to a complete certainty that every claim for every UST release is paid? In a word, no.

Because there is such a variety in policy language, and the policy is a contract, there is always the possibility that a release will not be covered. USEPA acknowledges that due to differences in policy language and the very structure of insurance itself, there are “gaps” where the costs of cleanup for a release may not be covered by insurance. It is a fact that releases that occur before a policy is in effect—commonly called historic contamination—are not the responsibility of the insurance company. The analogy here would be purchasing fire insurance ten minutes *after* flames are shooting out the house windows.

The Key to Successful Insurance FR

What then is the key to a successful UST program that utilizes insurance as an FR mechanism? The USEPA insurance study concludes that “Practically, relying on pollution insurance to finance UST cleanups and third-party damages means that someone, other than the owner or operator, plays a predominant role in determining and controlling whether and when funds will be provided by the insurance policy and which expenses will be reimbursed.” So how do we ensure that the individuals who should benefit from the insurance policy but are not in

total control of the situation are best positioned to receive the benefit of insurance?

First and foremost the purchasers of UST pollution liability insurance must understand what they are purchasing and the rules associated with the insurance contract. To that end the Association of State and Territorial Solid Waste Management Officials has published a simplified *Guide to Tank Insurance* (http://astswmo.org/Files/Policies_and_Publications/Tanks/2011.10_Guide_to_Tank_Insurance_FINAL.pdf). When tank owners and operators blindly purchase insurance without understanding what the policy will actually pay

for and what their obligations under the contract are, there is much less certainty that a release will be covered by the insurance company.

Coming Up

Future articles will discuss the finer nuances of pollution liability insurance, including an explanation of insurance terms, differences in policy language, gaps where insurance will not pay for contamination and what can be done to close these gaps, what is acceptable documentation of adequate tank insurance, and whether tank insurance adequately fulfills the intent of the regulations as opposed to just the letter of the law. ■

How Certain is FR? The State Fund Perspective

by Chuck Schwer

It's been more than 25 years since the federal UST rules were promulgated, requiring UST owner/operators to have a financial responsibility (FR) mechanism in place to mitigate any harmful effects from leaking underground storage tanks (LUSTs). At the time, with the private insurance option either unavailable or unaffordable for most tank owners, 36 states adopted a state cleanup fund to satisfy the FR requirement.

It seems like yesterday when in 1992 we “new” state fund administrators got together in South Dakota to discuss this challenge. Looking back over these past 20 years, it's not a moment too soon to reflect on how well state funds have satisfied the requirements of FR. But any kind of sweeping assessment of state funds is not all that easy...not all state funds were created equal. Some state funds cover more than just USTs. Some must answer to a board. Some have adequate revenue and others not so much. Yet, after careful consideration, I am comfortable in saying that, for the most part, state funds have met the intent of FR.

Money Well Spent

Over the past 20 years state funds have spent more than \$18 billion to address petroleum contamination at LUST sites. These funds have been used to mitigate both public

health and environmental problems at nearly 200,000 contaminated sites throughout the country. These sites include circumstances where public and private drinking water supplies were contaminated; where petroleum threatened the health of surface water bodies, including lakes, ponds, and wetlands; and where petroleum vapors adversely affected the indoor air in businesses and homes and, in some cases, posed a risk of explosion.

Over the years, state fund program personnel have worked hard to find ways to use their often-limited public funds more efficiently. Various cost-control tools were developed and tested, including preapproval, fee schedules, pay-for-performance, equipment reuse, payment limits, and more. State fund programs also sought to ensure that site cleanups were more effective. Innovative techniques such as soil vapor extraction (SVE), air sparging, bioremediation, chemical oxidation, and surfactant flushing have all been tried and tested in hopes of finding better ways to remediate LUST sites.

Survival Challenges

Despite state fund successes, many fund managers have had to slog through some difficult mine fields...in a few cases the difficulties were ultimately insurmountable. Pitfalls along the way—raids on state funds,

insufficient revenues, too many sites, too many commitments—have created circumstances where some funds have had to take rigorous measures that resulted in slowing the pace of cleanups. These measures include prioritizing claims, delaying reimbursements, and changing fund eligibility criteria.

While most state funds have been able to work through their challenges, some have not. For example, the Michigan state fund declared insolvency in 1995 and is no longer active. Currently, the Connecticut state fund is having difficulties. Its future will depend on whether the state legislature takes necessary steps to satisfy USEPA requirements. If not, will Connecticut tank owners be able to satisfy FR requirements without the state fund? Experiences in other states suggest that going it without a state fund creates a serious challenge with regard to cleaning up the backlog of contaminated sites—the primary goal of FR.

So as we look ahead to the future, what is the certainty of state funds and their ability to satisfy FR requirements? If past performance is any indication of the future, and barring some tumultuous set of circumstances, I believe we will see continued state fund success for most state fund programs. ■

Chuck Schwer is a section chief with the Vermont Department of Environmental Conservation. Chuck and his team have been preparing the annual state fund survey since 1993. He can be reached at chuck.schwer@state.vt.us.

Tank-nically Speaking

by Marcel Moreau

Marcel Moreau is a nationally recognized petroleum storage specialist whose column, *Tank-nically Speaking*, is a regular feature of LUSTLine. As always, we welcome your comments and questions. If there are technical issues that you would like to have Marcel discuss, let him know at marcel.moreau@juno.com.

The Car That Went Bump into the Dispenser

It was a dark and stormy night in the peaceful hamlet of Fort Edward, in upstate New York, some 50 miles north of Albany, when...

Courtesy of Derek Pruitt, The Post-Star, Glens Falls, NY.



Emergency responders on the scene at Cumberland Farms in Hudson Falls, New York. The NYDEC estimates up to 1,200 gallons of gasoline leaked from a pump at the store on the night of December 27, 2011, after a car bumped the pump.

It sounded like a bomb...My dog jumped, and in the kitchen my dishes fell out of the cupboard, and some of them broke...They told me I had to get out of here...I was petrified. My God, my heart was beating so fast I thought I was going to have a [heart] attack.

Elaine Pagana, Fort Edward resident
Interview with Christine O'Donnell, News10abc, 12/28/11

For a few brief moments, it sounded like a war zone out here.
Randy Diamond, Hudson Falls Police Chief
Interview with Matt Hunter for YNN News, Hudson Falls, NY

I get out of the shower and here comes a BOOM!! It raised me right off the floor. About 15 minutes later we get another BOOM!! Things are shaking, falling off the shelves, falling off the walls. My boyfriend looked out the window and he said it looked like smoke just lifted this manhole cover right up. When he saw that, he jumped back and that's when the glass shattered, and he says, "let's get the...heck out of here!"

Cerise Dingman
Interview with Matt Hunter for YNN News, Hudson Falls, NY

There was a lot of flames coming out of the ground, a lot of smoke, it was very loud. It really got our attention.

Mark Hurlburt, Fort Edward Fireman
Interview with Christine O'Donnell, News10abc, 12/28/11

What Can Go Wrong Did Go Wrong

For terrified residents, it was a chilling night to remember. The chain of events began with a minor encounter between a vehicle and a gasoline dispenser, followed closely by a fractured shear valve that failed to close, a runaway submersible pump, and a delayed response by employees. The end result was the release of 1,200 gallons of gasoline that flowed directly into the adjacent storm drain. Add an unidentified source of ignition for the gasoline vapors in the Fort Edward combined storm/sanitary sewer system, and you have an instant war zone, with pillars of flame and smoke launching hundred pound manhole covers over the roofs of houses.

For a Cumberland Farms gas station some two miles away in Hudson Falls, New York, it was the beginning of a nightmare that is not likely to be over any time soon.

Here's what I have pieced together from news reports of the incident. A man stopped at a Cumberland Farms store in Hudson Falls to buy some beer. It was about 7:15 on the evening of December 27, 2011. It had been raining heavily. The man was the only customer at the store. After completing his purchase, he backed his recently purchased car out of his parking spot, nudging a gasoline dispenser in the process. He said the radio was playing. He swore he did not know he'd hit the dispenser and that if he had known, he would have stopped and told someone.

All indications are that this was in fact a minor accident. His car showed a barely noticeable narrowing of the joint between the bumper and the fender. There were no dents. The paint was intact. The dispenser showed an obvious dent on a front panel, but one that looked like it could have been inflicted by a solid kick with a booted foot, not a significant encounter with an automobile. I can imagine that many a distracted driver talking on a phone or tending to a crying infant could have caused the same damage without noticing.

The impact of the car, though minor, was sufficient to move the dispenser slightly. This movement was sufficient to fracture the shear

section of at least one shear valve. But the movement of the dispenser was not sufficient to cause the trip mechanism of the shear valve to operate, so the shear valve remained open. This is not exactly a common occurrence with shear valves, but it is a known issue.

When properly installed, dispensers are firmly bolted to the concrete island on which they sit. Because such a relatively minor impact had such severe consequences, it is my suspicion that this dispenser may not have been properly anchored.

Under normal circumstances, the shear valve would have begun to leak when the next customer arrived to pump the grade of gas that flowed through the valve. The leak rate would have been substantial, so a mechanical leak detector would have put the dispenser into slow flow, and an electronic line-leak detector would have shut down the pump at the end of the dispensing cycle. With appropriate response from the personnel involved, the release would have been relatively minor.

But there was an additional problem. News reports make it clear that fuel was gushing out of the dispenser even though no customers were pumping gas. With all of the nozzles hung up, the submersible pump should have been off. Why was the pump on? I believe the most likely answer is that the pump relay was stuck in the "on" position.

Submersible pump motors are generally energized only when a customer removes a nozzle and pushes a button to select a specific grade of fuel. The switch mechanism at the dispenser typically operates on low current that activates a heavy-duty switch (known as a relay) inside the facility that directly controls the current to the pump motor. The heavy current loads on these relay switches sometimes cause the switch contacts to weld together. When this happens, the switch becomes stuck in the "on" position, and the pump motor runs continuously. Because the pump motor is always "on," there is no immediate indication that there is a problem because customers are able to get fuel just as they normally would.

If you are an astute UST person, you will immediately be saying "uh-

oh," because you realize this means that the line-leak detector, which requires the pump motor to be cycled "on" or "off" depending on the type, would not be able to detect this leak. Even worse, because the pump would always be on, the fractured shear valve would begin to leak immediately, even though there were no customers at any of the dispensers.

Some Time Later...

It was a dark and stormy night, so the Cumberland Farms facility was not exactly a beehive of activity. At least several minutes after the beer customer left the facility, another customer rushed into the store announcing that gasoline was pouring out of a dispenser. News reports indicate that an employee followed procedures to shut down all gasoline dispensing but that the fuel kept flowing.

A likely scenario is that the employee activated the "all stop" button on the point-of-sale system. This button stops dispensing activity by closing valves in all the dispensers. The "all stop" button would be effective if there were a defective nozzle spewing gasoline all over the forecourt, but this button does nothing to turn off the power to the submersible pump motor. What was needed was an emergency stop switch. This store either did not have one or the employee did not know where to find it.

Emergency stop switches have been part of fire codes for decades. Fire codes generally specify the location of these switches and that they must be clearly identified and easily accessible. Emergency stop switches are intended to immediately stop all fuel-pumping activity by cutting power to all of the pump motors present at the site. Since 2000, the NFPA fire code also specifies that activating the emergency stop switch should also de-energize all electrical circuits in any area where flammable vapors may be present. This would eliminate electrical sparks as a source of ignition for fuel vapors. Emergency stop switches are a critical component of gas station safety.

Having no success in stopping the flow of gasoline out of the dispenser, a store employee called the Cumberland Farms "help desk" and left a message. The employee did not

■ *continued on page 10*

■ Tanknically Speaking *from page 9*

receive a call back. At some point, an employee called the fire department. Eventually, an employee succeeded in turning off the pumps, apparently by shutting down circuit breakers at the main electrical panel. By this time, fuel had been flowing from somewhere between 15 minutes to a half hour and some 1,200 gallons of gasoline had been released. The gasoline flowed a short distance across the facility driveway and directly into a storm drain.

Journey Through the Storm Sewer

The short surface pathway the gasoline took may have prevented a major conflagration. On a similarly rainy night in Biloxi, Mississippi in 1998, gasoline from a tank overflow incident flowed to an intersection where vehicles were stopped for a traffic light. When the gasoline ignited, five people burned to death.

The combined storm/sanitary sewer system in Hudson Falls was flowing nicely because of the recent rain. The 1,200 gallons of gasoline flowed some two miles within the sewer system to the community of Fort Edward. Somewhere in the sewers of Fort Edward, gasoline vapors in the flammable range encountered a source of ignition and several explosions ensued.

Flames belched from sewer openings as some 25 manhole covers were blown into the air, in some cases over the tops of houses, and came crashing back to earth. Windows were broken, dishes crashed to the floor, and pavement was cracked. The sewer



Debris from the sewer explosion lies in the middle of Satterlee Lane in Fort Edwards, December 28, 2011.

Courtesy of Derek Pruitt, The Post-Star, Glens Falls, NY.

treatment plant was flooded with gasoline. Not knowing exactly what was going on or what was to come, police and fire crews evacuated hundreds of residents. Miraculously, there were no injuries, except for an individual who was blown into some bushes and twisted his knee.

Stay Tuned

That's the story of "the car that went bump into the dispenser" as ascertained primarily from news reports of the incident. I have also deduced information presented in this article from my own knowledge and experience with UST systems and corroborated some information with personnel from the New York

Department of Environmental Conservation who are familiar with the investigation.

As might be expected, there is enforcement action simmering over the events that happened in Hudson Falls and Fort Edwards. Luckily, the damages involve primarily sewer lines and a sewage treatment plant, not death or serious bodily injury. Because of the pending enforcement action, however, there are still some details of the incident that have not been made public. I don't expect that additional information will change the general picture of what occurred as described in this article, but if this happens, corrections will appear in a future *LUSTLine*. ■

From Our Readers

Shear Valves Did Their Job in Recent Kentucky Tornadoes

I found the "Extremes" articles in *LUSTLine* #69 quite interesting. On March 2, 2012, tornadoes tore through West Liberty and Salyersville in Eastern Kentucky. These two towns both experienced EF3 tornadoes. Though stronger tornadoes hit elsewhere in the state, these were the only two areas where gas stations were severely walloped.

I am happy to say that out of the eight UST facilities destroyed during the tornadoes, none experienced releases to the environment. At seven of these eight UST facilities, the shear valves all closed properly when the dispensers were ripped off. At the one facility where this didn't occur, the dispenser lines were not severed to cause the shear valves to trip, so there was no release.

Many times we wonder if our compliance efforts are doing any good. It was gratifying to see the equipment operate the way it should to prevent releases and protect the environment in the aftermath of such a tragedy. ■

Leslie Carr, Kentucky DEP

What Can We Learn from the Hudson Falls Incident?

by Marcel Moreau

Incidents such as the one in Hudson Falls, New York, are not commonplace. But when they occur, they present “teachable moments” for all who own, operate, service, or regulate fueling facilities. This incident illustrates just why it is we have codes, regulations, manufacturer’s instructions, and industry recommended practices. Here’s what I see as the lessons to be learned from this incident.

Don’t Forget the Little Stuff

Whether the dispenser in this event was bolted to the concrete is a detail that has not yet been made public. But regardless of whether this dispenser was properly anchored, now is a good time to reflect on the importance of dispenser anchoring. Bolting a dispenser may seem like a trivial aspect of installing today’s complex multiproduct dispensers (MPDs). After all, MPDs are heavy, and gravity is a pretty reliable force for keeping them in place. But an unanchored dispenser can be easily budged by a slight collision with a vehicle, an event that is not that uncommon. It is exactly this minor movement of the dispenser relative to the rigidly anchored shear valve that can cause the shear valve to crack but not to trip, as may have been the case in the Cumberland Farms incident.

In addition, dispensers nowadays should have breakaway couplings installed on dispenser hoses designed to separate when customers drive off with a nozzle still in the fill opening of the vehicle. It takes a very substantial force to separate a breakaway coupling, and that force will be pulling at the very top of the dispenser cabinet. If not solidly anchored, the dispenser may tip over before the breakaway separates.

Anchoring is not an optional step in dispenser installation.

The Shear Valve Can Save the Day

Shear valves are among the wall-flowers of the UST world, waiting patiently and inconspicuously at the base of the dispenser cabinet for the one heroic moment when they can save the day. They were developed in the 1950s, shortly after the introduction of submersible pumps. They

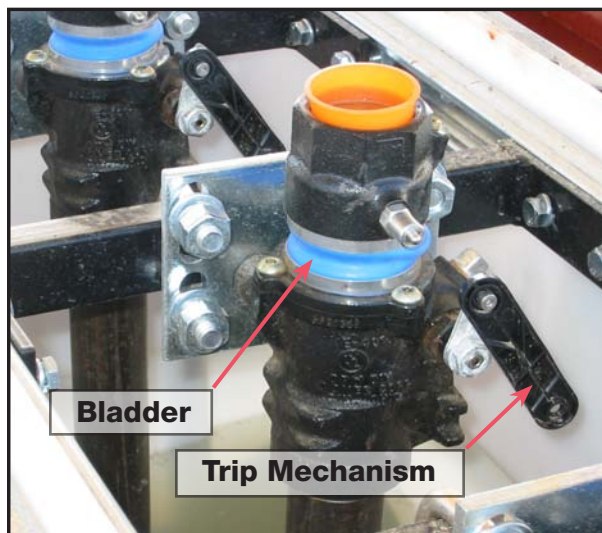
are a critical safety component of pressurized pumping systems. The type of failure that occurred in the Hudson Falls incident has been recognized for some time, and there is now a shear valve on the market that has addressed this problem (Figure 1). The shear section of this valve is enclosed in a flexible bladder that is inflated by the gasoline leaking from the shear section. As the bladder inflates, it trips the shear valve and closes it. The Cumberland Farms incident illustrates why a shear valve with this feature can be cheap insurance against catastrophic releases.

While I’m on the subject of shear

ground piping with a single-valve mechanism (or poppet) (Figure 3). Gasoline in the dispenser piping is not contained and generally flows out of the dispenser when the shear valve operates. Double-poppet shear valves have an additional poppet that closes off the dispenser piping so that the substantial amount of fuel present in a typical MPD is not allowed to flow out when the dispenser is hit.

Fires codes have not favored double-poppet shear valves for fear that the gasoline trapped in the dispenser piping would create a “bomb” should there be a fire

FIGURE 1. This shear valve is designed to operate even when only minor impacts occur. The shear point is enclosed in a liquid-tight flexible bladder (shown in blue online). When the shear point fractures and fuel leaks out, it inflates the bladder. The bladder presses against the trip mechanism, which, in turn, unlatches the arm holding the poppet open, and the valve closes—regardless of whether the top part of the valve moves relative to the bottom part. The valve will also operate in the traditional manner if a major impact occurs. The trip mechanism in this photo is disengaged and the valve is closed. Note the heavy-duty bolts and steel framework used to fasten the shear valve. The bottom part of every shear valve must be rigidly anchored for the mechanism to operate as designed.



valves, let me pull up my soapbox. I think it’s time to look seriously at double-poppet shear valves (Figure 2). Traditional single-poppet shear valves only close off the below-

when the dispenser is knocked over. Some 15 years of experience with double-poppet shear valves shows that the “bomb” fears are ground-

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■ What Can We Learn from page 11

less, because double-poppet shear valves are effective in containing the fuel and preventing fires from occurring in the first place. Single-poppet shear valves, on the other hand, are commonly associated with significant fires when subjected to a major impact. People die in these fires. It's time to recognize that double-poppet shear valves can save lives, and their use should be encouraged, not discouraged.

Like all mechanical devices, shear valves should be periodically operated and tested to be sure they will function appropriately when their big heroic moment comes. Fire codes have specified an annual test of shear valves for as far back as I can tell, which is some 30 years. A specific procedure for testing the operation of shear valves is described in PEI/RP500, Recommended Practices for Inspection and Maintenance of Motor Fuel Dispensing Equipment.

Emergency Shutoff Switches Are Not Optional

When bad things happen, personnel at a fueling site need to have a simple, effective, convenient, easily recognized way to shut-off all possible flow of fuel and minimize electrical sources of ignition. This is what emergency shutoff switches do. Like seat belts, airbags, and fire extinguishing systems, you hope you never need them, but you sure are grateful to have them do their job when you do need them. Such equipment is insurance against catastrophe. And just like any insurance policy, this equipment has to be in place *before* the accident happens. And once the switch is installed it must not become a convenient place to hang your jacket, nor must all those display cases of beer be stacked in front of it. Emergency shutoff switches are crucial pieces of equipment.

Although usually more colorful and located in a more obvious location than shear valves, emergency shutoff switches are also among the wallflowers of the UST world, waiting patiently for their turn to dance. They too should be tested annually for proper operation. Refer to PEI/RP500, *Recommended Practices for*

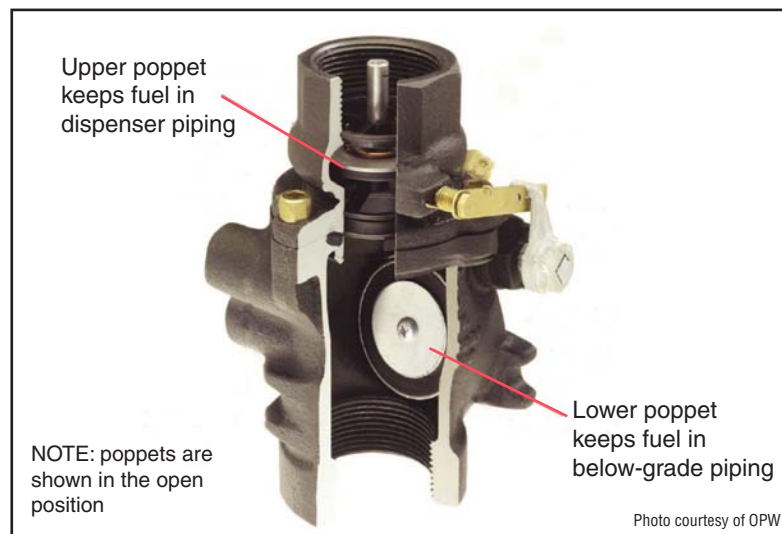
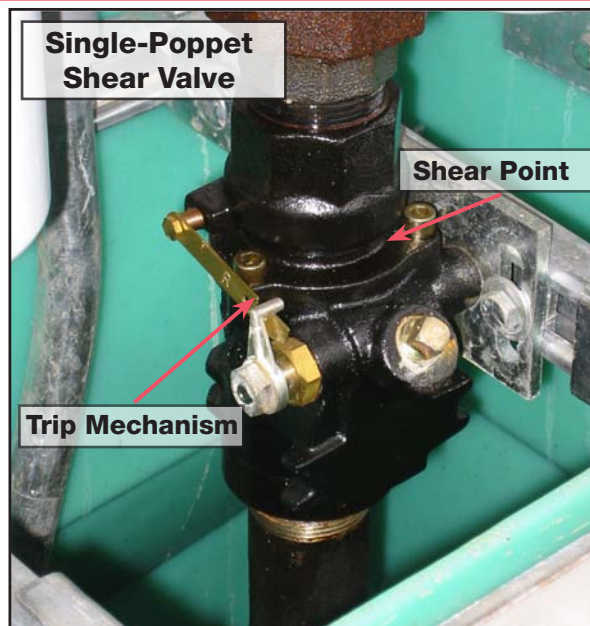


FIGURE 2. This cutaway shows the internal workings of a double-poppet shear valve. When the shear valve “trips,” the lower poppet rotates upward and closes off the flow of fuel, while the upper poppet moves straight down and closes the opening so that fuel cannot drain out of the dispenser piping.

FIGURE 3. Shear valves get their name from the shear point, a thin part of the metal casting designed to break when the top part of the valve above the shear point moves relative to the bottom part. The valve mechanism includes a hefty spring that closes the poppet, the disk that closes off the flow of fuel (see Figure 2). The poppet is held open by a trip mechanism, a thin bar of metal with a notch in it. An arm on the outside of the shear valve sits in this notch and holds the poppet inside the valve in the open position. When the top part of the shear valve moves relative to the bottom part, the arm slips out of the notch and the spring closes the poppet, stopping the flow of fuel. In the Hudson Falls incident, the top part of the shear valve moved enough to fracture the metal at the shear joint, but there was not enough movement to cause the trip mechanism to operate, so the poppet remained open.



Inspection and Maintenance of Motor Fuel Dispensing Equipment, for a description of the test procedure.

Employee Training Is Imperative

The frequent turnover in convenience store industry personnel means that inexperienced operators are commonplace. This

incident points to the importance of providing emergency response training before handing over responsibility for a facility to an employee. I don't know the details of the training provided to the personnel on duty at this Cumberland Farms facility, but it seems to me that they took an inordinately long time to shut off the flow of fuel.

Proper training should emphasize knowing the location and function of the emergency stop switch and understanding the distinction between the “stop” button on the point-of-sale console and the emergency stop switch. Learning the location and the purpose of these switches and when to use them should be the first thing new employees learn about their new workplace.

Pump Relay Failure Should Be Monitored

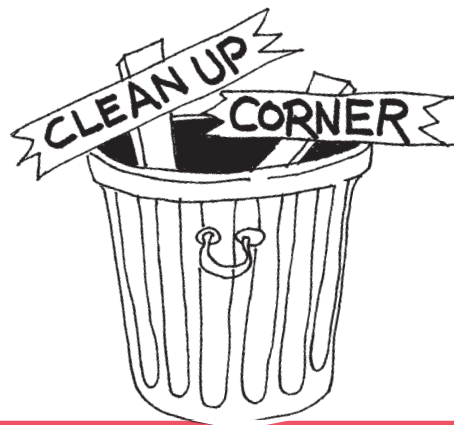
Pump relays that are permanently “on” are a problem that garners little attention in the retail fuel industry because the switch failure does not interrupt fueling operations and has little effect other than increasing the electric bill. But such failures effectively disable line-leak detection and can contribute significantly to the severity of releases resulting

from cracked-but-not-tripped shear valves, as well as typical piping and dispenser leaks. These days, there are pump controllers and some electronic line-leak detectors that can monitor the operation of the pump relay to be sure that it is cycling properly and provide an alarm signal when a stuck relay is detected. It seems to me that it is about time for the industry to acknowledge and implement solutions to this problem. ■

Cleanup Corner

A Neat Little Column by Gary Lynn

Gary Lynn is Petroleum Remediation Manager for the State of New Hampshire. Over the years he has authored many insightful and informative LUSTLine articles, so we figured it was high time to put his stories in his own Cleanup Corner.



THAR'S GOLD IN THEM THAR HARD DISKS

The sheer volume of information collected by state environmental programs can overwhelm and numb the uninitiated. I call the process of making the data meaningful and useful “data mining.” This terminology was particularly apt back in the days when researching files was comprised of visits to poorly lit storerooms with file boxes rising up from floor to ceiling. Although a paper cave-in never seriously hurt anyone in my agency, data mining in the old days was time consuming, frustrating, and at best, somewhat successful.

With the advent of networks, file servers, and computerized records, data mining has come of age. The New Hampshire Department of Environmental Services (DES) has been able to use data mining techniques to resolve dormant sites, identify brownfields sites, reduce receptor risks at contaminated sites, and to troubleshoot emerging groundwater threats. So let's put our hard hats and head lamps on and explore some ways to get more out of your data.

Pinpointing Those Brownfield Sites

One of the more interesting uses of data mining is identifying petroleum brownfields sites. Pinpointing these types of sites improves the ability of municipalities and other groups to apply for and obtain brownfields grants and allows the state to target its resources to facilities that might have a blighting or negative economic impact.

What types of data are available that could help identify brownfields sites? In New Hampshire a number of deadlines are approaching that will require tank system hardware upgrades. For example, single-walled tanks and piping must be upgraded by the end of 2015 and substandard Enviroflex piping must be upgraded within the next 18 months. In addition to tank hardware-upgrade data, we have data on tanks that are in temporary closure and tanks with leaks into the interstitial space.

Such upgrade-induced economic stresses are likely to lead to fore-

closures or an interest in the sale or reuse of some of these properties. It is possible to couple the tank-facility upgrade data with internet resources and further refine lists of potentially distressed properties that could be helped by brownfields programs. For example, tools such as Google Earth/Street View, and in New Hampshire our online digital library of site photos, make it possible to view the condition of a property. Web search engines can also identify properties that are for sale or have been foreclosed on by simply entering the property street address as the search criteria.

DES has successfully identified owners that had major health issues or were nearing retirement and has helped them via brownfields programs to sell their property or remove unwanted USTs. The typical end result of this assistance is a property that is either brought into compliance or has a new owner with more energy and resources available to address site issues.

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Field Notes

from Robert N. Renkes, Executive Vice President, Petroleum Equipment Institute (PEI)

25 Years Since UST Leaks Were an Inconvenience

The PEI Journal will include two articles in its 2nd Quarter 2012 issue about the biggest developments and changes the underground storage tank industry has seen since the UST regulations were first proposed in 1987. One will be written by LUSTLine's own Marcel Moreau. The other will feature perspectives, memories, and thoughts from eight industry experts who were around in 1987 and continue to be active in the industry today. One of those experts is Jim O'Day, CEO of O'Day Equipment, LLC, headquartered in Fargo, North Dakota. Jim's comments, as a longtime member of the Petroleum Equipment Institute and the Steel Tank Institute, were just plain old good and—quite honestly—better than anything I could write on this 25th Anniversary year of the proposed UST regulations. So I decided to share them with you. Enjoy.

First of all, I am disturbed that it has been 25 years since the UST rules were first proposed. That means I have been doing this stuff a long time and I must be at least “middle age” or older.

When I started in the business during the 1970s, underground tank leaks were a common but inconvenient reality of tank ownership. I recall the senior members of the company telling customers that the expected life of an underground tank was about 10 years...before it leaked.

Leaks were inconvenient. Back then it was all about product loss and water intrusion. Disputes over leaks were always about product loss; the environmental impacts were never in the discussion. Our company started manufacturing sti-P3 tanks in 1975 but it was a tough sell.

A turning point for UST owners and suppliers was the awareness of the environmental impact of leaking tanks and piping and the “absolute pollution exclusion” that became part of liability insurance policies.

A turning point for our business was when, as a policy, we would no longer sell or install unprotected tanks and piping for UST systems. We made this move in 1985. While we lost business as a result, the USTs we installed the next several years did not require anything when the new regulations came into effect.

One thing that made a significant impact on the industry was the first Recommended Practice PEI sponsored. RP100 was the first guidance document that brought together best practices from a group of subject

matter experts with real world experience. This was a big help in improving installation practices across the United States.

One technology that was around but hardly worked was “leak detection.” It was often sold, but always disabled, because it just did not work in the field. Today, we respond to leaks that are as small as a seep from a gasket. Inventory reconciliation and other fuel management is made easy with automatic tank gauge (ATG) systems developed for testing tanks.

I was at a Steel Tank Institute meeting in 1978 where a fellow from Germany was presenting how they developed double-walled tanks. The audience of U.S. tank builders looked at him like he was from outer space. A year later a Canadian presented his concept of the “Haz-Bag,” which gave everyone in attendance a chuckle. We did not understand that we were looking at the future.

One thing that is different today from 1986 is the care and attention today's UST owners and operators need to give to their UST system operation. There must be a need beyond mere fueling convenience to own an UST today, because the operational aspects associated with dealing with the ongoing compliance responsibilities are daunting.

Who would have thought that double-walled tanks and piping would be the norm when this all started? I never expected would be the standard for all new USTs. That being said, I do understand that that's the way it should be. ■

An AST Conflagration That Needn't Have Been

On August 18, 2011, a delivery driver from Florida Rock & Tank Lines was refilling an above-ground storage tank at the 5th Wheel BP gas station in St. Augustine, Florida. According to the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA), the tank had a broken liquid-level gauging system. Gasoline overflowed from the tank. Vapors then combined with heat from the running delivery truck to trigger an explosion. According to published reports, the resulting fire took several hours to put out. The delivery driver suffered third-degree burns and spent several weeks in the hospital.

Following a six-month investigation, OSHA proposed a \$70,000 fine against Florida Rock & Tank Lines, along with a citation for a willful violation for “failing to provide a means for the delivery driver to determine if the storage tank had enough capacity for additional gasoline.” Coomes Oil was cited for one serious violation with a proposed penalty of \$7,000 for “failing to provide

employees and delivery drivers a means to determine the gasoline levels in the aboveground storage tank.”

The fire, injuries, and property damage would not have happened if PEI's *Recommended Practices for Overfill Prevention of Shop-Fabricated Aboveground Tanks* (PEI/RP600) had been followed. Published first in 2007 and just now revised, the document continues to fill the need for a comprehensive reference guide that the industry and regulators can use to minimize aboveground tank overfill incidents.

The second edition of PEI/RP600 has been reviewed and revised to provide better clarity to some provisions of the document. The 27-page document supersedes and replaces the previous edition of PEI/RP600. If you install, maintain, own, fill, regulate, or manage aboveground storage tanks, you should have a copy of this publication. Learn more and order online (\$40 for members and regulators; \$95 for nonmembers) at www.pei.org/rp600. ■

Circa 1888 Rail Tanker Car/UST Discovered in Knoxville, TN

by Lamar Bradley

Following up on a complaint last July, Tennessee Department of Environment and Conservation (TDEC) staff members discovered what could possibly be the oldest underground fuel storage tank in the world, dating back to just after the Civil War. TDEC was notified when a local resident reported seeing people in the vicinity of a cylindrical metal protrusion with a large and potentially unsafe opening (Figure 1). The cylinder was located in a remote, overgrown area, and the caller was concerned about the safety of children playing in the area of this... thing.

Rick Huchison, a staff member with TDEC's Division of Underground Storage Tanks in Knoxville, visited the reported location and discovered an exposed metal cylinder with an opening of approximately one and a half feet in diameter and standing about one and a half feet high. The structure was in a heavily wooded area on property that had once been used for zinc mining. The mining operation had ceased in the early 1970s and the property had been essentially abandoned since that time. Raised letters in the metal dome around the opening of the cylinder read "Harrisburg Car Manufacturing & Makers Harrisburg PA 1888." It appeared we had ourselves some kind of buried tank from a rail car.

There were several steel posts around the tank opening, indicating the area had once been gated. Buckets, ropes, rubber bands, plastic jugs, and other debris were on the ground around the cylinder opening. The tank had no lid, nor was any lid visible on the ground nearby. By using a tank gauging stick to determine if there was liquid inside we discovered that the bottom of the tank was 103 inches from the opening and that the tank contained what appeared to be 20 inches of product and an immeasurable amount of water. The liquid appeared to be heavy-end petroleum, possibly diesel, heating oil, or kerosene. We



FIGURE 1. Top of 1888 railroad car originally built to transport oil for the Pennsylvania Railroad. This is all that was visible to Huchison when the tank was first discovered.

later determined that the old, sticky product masked the product-finding paste and the liquid was mostly water.

The Harrisburg Car Manufacturing Company

Curious about his unusual find, Huchison conducted some research the next day and, based on information he found online, he believed the exposed metal cylinder was indeed the top dome of an old railroad tanker car. Wording stamped into the metal superstructure indicated this rail car was manufactured by the Harrisburg Car Manufacturing Company.

The Harrisburg Car Manufacturing Company had an interesting history. Founded before the Civil War, the company produced railroad cars for passengers, mail, baggage, box, cattle, platform, coal, and hand cars. Local blacksmiths employed by the company forged and crafted the metal portions of the rail car. The company weathered the economic ups and downs of the 1850s and survived the Civil War.

The discovery of oil in Titusville resulted in an oil boom in Pennsylvania following the war, and company business boomed supplying oil tank

cars for transporting oil from the oil fields. Harrisburg's early tank cars were nothing more than conventional flat cars with a metal tank sitting on top and stabilized by wood blocks. An iron railing around the perimeter of the car was supported by wood stanchions. The design was improved and modernized during the following years but always retained the wooden frame. Our buried tank car appeared to be based on the company's 1875 design when compared with drawings that were available online (Figure 2).

By the mid-1880s, the railroad building boom had reached its peak and production slowed. However, by the end of the 1880s, meat packers had perfected the art of preserving beef. What was needed was a means of transport—a refrigerated box car. Harrisburg Car Manufacturing Company was the first to build such a car. Things looked up, and the company was enlarged, based on the expectation of more orders. Alas, that did not happen, and the financial difficulties of the 1880s left the company with little in assets. By 1893, the company was in bankruptcy court, never to emerge.

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■ Rail Tanker from page 15

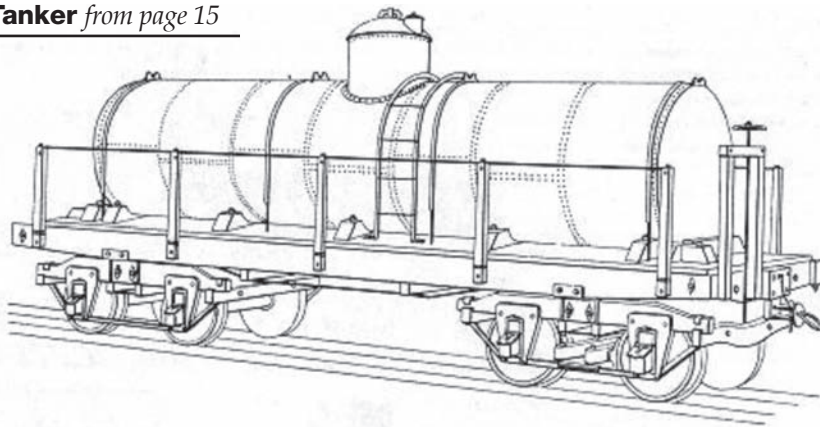


FIGURE 2. Harrisburg Car Works designed this tank car in 1875 for the Pennsylvania Railroad. Information about the Harrisburg Car Manufacturing Company and the illustration of the 1875 rail car are used with the permission of the Mid-Continent Railway Museum, North Freedom, Wisconsin.

The Exhumation

Our Underground Storage Tanks Division was concerned that someone could fall into the large, unsecured opening to this tank and quickly engaged a state contractor to empty and secure the tank. A few days after the initial visit, UST personnel made another visit to the site to oversee the removal of product/water from the tank and to secure the opening until it could be determined who would take responsibility for the tank. The tank was gauged again and a total of 20 inches of liquid was documented. A vacuum unit removed approximately 410 gallons of product/water. Before leaving the site, the tank openings were covered and secured.

The current property owner was not aware of the existence of the tank nor any use of the tank since the days of the active mining operation. It was not exactly clear who would be responsible for removal of the tank or what would be found when the tank was unearthed. Ultimately, the property owner agreed to take responsibility for removing the tank.

In January 2012, the tank was removed from the ground and its identity as a tank from a railroad tanker car manufactured in 1888 was confirmed. We were unable to ascertain when this rail car tank was buried or how long it had been in the ground. The tank measured approximately 26 feet long and 6.5 feet in diameter. It was in good condition with no observed corrosion holes. The tank was not on any kind of platform, and there were no railroad wheels found in the excavation.

When built, it appears the tank container was minimally secured to the platform and removing it from the platform to be buried would not have been difficult. While uncovering the tank, the excavator inadvertently made a hole in its top. Interestingly enough, no petroleum contamination was identified in the four soil samples that were collected from the bottom corners of the pit. The native soil in the tank pit was red clay and the backfill material was a limestone sand and regular sand. We speculated this may have been the oldest underground storage tank in use in the world at 124 years old... but that is mere speculation.

So What Happened to This Remarkable Find?

Since this rail car was used as an underground storage tank, tank closure was handled according to the normal UST closure procedures. Typically, used tanks are cut up and sold for scrap metal value. However, as unique as it was, I got to thinking that there may be some interest on the part of a railroad museum in preserving the car as a historic artifact. After several phone calls, personnel at the Tennessee Valley Railway Museum in Chattanooga expressed an interest in taking possession of this artifact and possibly restoring it.

Museum personnel were put in contact with the tank excavator and an agreement was reached for the museum to acquire the tank...a mere one day before the tank was scheduled for destruction. As this article was being written, the museum is awaiting arrival of a piece of railroad history. ■

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FIGURE 3. The Harrisburg Car Manufacturing Company 1888 rail car being removed from the ground. It is unknown how long this tank was buried, but there were no corrosion holes in the tank when it was excavated.

TALKS ON TRIBAL LANDS

Exemplary Response to a Diesel Fuel Release at a Laguna Pueblo Route 66 Travel Center

The Laguna Pueblo Route 66 Travel Center is a major truck stop located about 30 miles west of Albuquerque, New Mexico. The Laguna Development Corporation (LDC), an entity of the Pueblo of Laguna, operates the center. During a routine facility check, the security staff discovered a release from the large diesel tank system. Diesel fuel was coming out of a manhole and through the cracks near the asphalt, spilling onto the parking lot.

The LDC security staff quickly notified the manager on duty, who immediately shut off the power to the tank fuel pumps. LDC took immediate action to contain the emergency, including contacting the Risk Management Department, Laguna Police, and New Mexico State Police. The next morning, the LDC notified the Laguna Environmental Office of the release and took the necessary steps to prevent fuel from migrating and adversely impacting two nearby drinking water wells. The wells supply water to the truck stop and to adjacent entertainment, restaurant, and hotel facilities. USEPA Region 6 UST staff corresponded and met with the LDC and the Laguna Environmental Office shortly after the incident to provide further response guidance and confirm the release of petroleum product.

About 2,200 gallons of diesel fuel had been released as a result of an improperly installed new fueling system that the LDC had recently added to the facility. The LDC hired several remediation and UST equipment companies to complete the



Laguna Pueblo Route 66 Travel Center.



Remediation trench along diesel-fuel-release pipeline.

emergency response, clean up the release, dispose of contaminated spill absorbents properly, and fix the fueling system.

The LDC takes pride in their proactive, preventative management approach to minimizing future releases from their UST systems. In this case, they went beyond the required response by upgrading the equipment in the tank pit and at the dispenser fueling area in an effort to prevent future releases. In addition, they installed three wells to ensure ongoing water supply monitoring. During January 2012, the LDC, Laguna Environmental Office, and EPA Region 6 met to verify that no contamination from this release affected the drinking water supply and agree that the cleanup was completed. This is a great example of a responsible party taking prompt action to respond to a release and to pay for a cleanup. ■

Crow Creek Reservation LUST Site Becomes Boys and Girls Club

The former Rank's Service Station is a leaking underground storage tank site located on the Crow Creek Indian Reservation in Fort Thompson, South Dakota. When the South Dakota Department of Environment and Natural Resources (SDDENR) conducted a limited site assessment in 2000, results showed elevated concentrations of petroleum hydrocarbons. At that time, Harvest Initiative, an organization that facilitates economic investment on the Crow Creek Sioux Indian Reservation, contacted USEPA Region 8 to express interest in constructing a Boys and Girls Club and office space at the site.

The Region worked closely with all involved parties to expedite clean-up of the site; including removing approximately 1,800 cubic yards of contaminated soil and incorporating a vapor barrier into the construction design. The barrier will prevent petroleum vapors from the groundwater contamination from entering the Boys and Girls Club and ensure the site will be safe for reuse. USEPA is continuing remediation at the site and anticipates completing cleanup by 2014. ■



Former Rank's Service Station.



New Boys and Girls Club.

FAQs from the NWGLDE

...All you ever wanted to know about leak detection, but were afraid to ask.

Here's How to Determine if an NWGLDE Listing Is Applicable for Use with Biodiesel Blends

In this LUSTLine FAQs from the National Work Group on Leak Detection Evaluations (NWGLDE), we discuss a change of policy that was implemented after the addition of biodiesel blends to NWGLDE listings, which was discussed in LUSTLine Bulletin 67.

Note: The views expressed in this column represent those of the work group and not necessarily those of any implementing agency.

Q. I submitted a request to add biodiesel blends to my ATG listings on the NWGLDE List. Why do I not see them listed under "Applicability" in any of my listings?

A. The following NWGLDE policy for listing biodiesel blends appeared in the NWGLDE FAQ in the March 2011 issue of LUSTLine, Bulletin #67:

"Manufacturers of leak detection equipment are encouraged to contact the appropriate members of the NWGLDE to request the addition of ASTM standard biodiesel blends to their current listings."

The NWGLDE realized shortly after this was published that some leak detection equipment is still in use where a manufacturer of the equipment is no longer in business. Without a change in NWGLDE policy, this equipment could not be used with any biodiesel blends, even though it is likely capable of being used with certain biodiesel blends. As a result, we added a new definition and a disclaimer to our website at www.NWGLDE.org that supersedes the above policy. Bold statements were added to the top of our home page with active links to the following definition and disclaimer in an effort to ensure the new policy would be noticed by everyone visiting the site.

Definition

Diesel or Diesel Fuel:

Middle petroleum distillate fuel that may contain up to 5% biodiesel in accordance with ASTM standard D975.

Disclaimer

Unless specifically indicated on the individual data sheets, equipment listed by the NWGLDE has not been determined to be acceptable for use with alternative fuels **with the following exception:**

Biodiesel B6 through B20 meeting ASTM D7647 and biodiesel B100 meeting ASTM D6751 may be used with all equipment listed for diesel in the NWGLDE list whether or not these alternative fuels are included on individual data sheets. This exception DOES NOT APPLY to leak detection test methods using Out-of-Tank Product Detection (Vapor Phase) for B6-B20, and Out-of-Tank Product Detection (Liquid and Vapor Phase) and any tracer-based test methods for B100. For these methods, individual data sheets will have to be referenced for applicability.

Since the definition and disclaimer may be somewhat difficult to follow, we have broken them down to clarify what they are saying as follows:

- Biodiesel B5 will not be shown on any NWGLDE leak detection equipment listings. Instead, all NWGLDE listings that are applicable for diesel are by definition also acceptable for use with biodiesel B5.
- Biodiesel B6 through B20 will also not be shown on any NWGLDE leak detection equipment listings. Instead, all NWGLDE listings that are applicable for diesel are now considered acceptable for use with biodiesel B6 through B20.
- Because diesel and biodiesel blends do not produce vapors, Out-of-Tank Product Detection (Vapor Phase) leak detector listings do not include diesel, and therefore will not be acceptable for use with any biodiesel blends.
- Biodiesel B100 will not be shown on NWGLDE leak detection equipment listings with the exception of Out-of-Tank Product Detection (Liquid and Vapor Phase) and any tracer-based test methods. Instead, all NWGLDE listings other than Out-of-Tank Product Detection (Liquid and Vapor Phase) and any tracer-based test methods that are applicable for diesel are also acceptable for use with Biodiesel B100.
- Manufacturers of Out-of-Tank Product Detection (Liquid Phase) and any tracer-based test methods must perform an evaluation using Biodiesel B100, and must submit the evaluation to the NWGLDE before any of the Biodiesel blends may be added to a NWGLDE leak detection equipment listing.
- Because biodiesel B21 through B99 blends are not included in an ASTM standard (see LUSTLine 67), leak detection equipment manufacturers must perform a third-party evaluation using these biodiesel blends. The evaluation must be submitted to the NWGLDE before the NWGLDE will consider adding any of these biodiesel blends to any NWGLDE leak detection equipment listing.

The NWGLDE needs to clarify that the above discussion concerning applicability of the diesel and biodiesel is based on *functionality* and not compatibility. The following NWGLDE disclaimer, which can also be found on our website, was written to clarify the reason for this:

FAQs... continued from page 18

Since long-term material compatibility with the product stored is not addressed in test procedures and evaluations, the NWGLDE makes no representations as to the compatibility of leak detection equipment with the product stored. ■

■ About the NWGLDE

The NWGLDE is an independent work group comprising ten members, including nine state and one USEPA member. This column provides answers to frequently asked questions (FAQs) the NWGLDE receives from regulators and people in the industry on leak detection. If you have questions for the group, contact them at questions@nwglde.org.

NWGLDE's Mission

- Review leak detection system evaluations to determine if each evaluation was performed in accordance with an acceptable leak detection test method protocol and ensure that the leak detection system meets USEPA and/or other applicable regulatory performance standards.
- Review only draft and final leak detection test method protocols submitted to the work group by a peer review committee to ensure they meet equivalency standards stated in the USEPA standard test procedures.
- Make the results of such reviews available to interested parties.

■ Gold in Hard Disks from page 13**Discovering the Success Stories**

Another way to strike data-mining gold is to research program success stories. Petroleum cleanup programs tend to function mostly in an "aw shucks, just doing my job" mode. Unfortunately, legislatures and politicians of all stripes are making tough budgeting decisions and are asking fundamental questions about continuing well-established programs. It is now essential to be able to articulate and promote the value of governmental programs.

Aggregate statistics touting tanks removed, sites closed, and tons of soil treated are valuable, but probably just as important is the development of success stories. These summaries can use a specific site to explain in a concrete fashion how our programs can assist with solving difficult problems. The internet is a wonderful way to find information on redevelopment success stories. We have been able to find data on economic impacts of sites that our programs helped to clean up and even awards won by those projects. I used this information to craft a series of well received success stories on the positive environmental and economic impacts of New Hampshire petroleum reimbursement funds.

Take Charge of Your Data

Data management and mining should play an essential role in developing good tank programs and sound state fund management. We have found it useful when research-

ing sites that are out of compliance to make the effort to better understand and address underlying issues. It is useful, for example, to determine current site ownership (e.g., foreclosure, tax deeding, property sale, property owner death) when attempting to obtain compliance. There are excellent online registry-of-deeds websites in New Hampshire that can be searched for tax, deed, and recent sale information. Simple queries can now identify all sites with overdue cleanup, UST compliance, or even cross-program compliance issues.

I particularly like the ability to find information on tank system hardware. This has provided very useful cross-program data that our remediation section has used to troubleshoot new releases or emerging threats (e.g., vapor recovery system hardware information was correlated with groundwater data to discover a link between groundwater contamination and vapor releases).

Finally, a variety of tools are now available to verify the accuracy of consultant contaminant-receptor surveys. Online access to recent aerial photograph data can confirm whether an undeveloped lot has been redeveloped into a lot with a brand new, vulnerable water supply well. Also, New Hampshire's geographic information system (GIS) makes it very easy to identify public water supply wellhead protection areas or private wells using our online water-well inventory GIS layer.

This is just a quick summary of the possibilities lurking in many rich veins of data that can be sifted and sorted to meet your program needs. My advice? **Take charge of your data and make it work for you. ■**

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To download the **LUSTLine** Index, go to
www.neiwpcc.org/lustline/ and then click on **LUSTLine**.

Kuhn and Falta Receive LUST Lifetime Scientific Achievement Award at the 2012 National Tanks Conference

This year's LUST Lifetime Scientific Achievement Award was presented to Ron Falta, Professor of Geology and Environmental Engineering at Clemson University, and to Jeffrey Kuhn, hydrogeologist and LUST/Brownfields section manager with the Montana Department of Environmental Quality. During the past several National Tanks Conferences, LUST program friends and colleagues have presented these awards as a thank you for the dedication and significant contributions of the recipients.

Ron's award was given for helping LUST programs recognize the dangers of lead scavengers associated with fuel spills and for contributing significantly to the science of site assessment and risk evaluation for LUST sites. Jeff's award was given in appreciation for his years of dedication, leadership, and advocacy for a scientific approach to site assessment, risk evaluation, and cleanup of fuel oxygenates and additives at Leaking Underground Storage Tank sites. ■



Friends, colleagues, and former award recipients join Jeff and Ron in appreciation and celebration. From left to right: Bruce Bauman, API, 2008 award recipient; Ellen Frye, LUSTLine Editor, 2010 recipient; John Wilson, USEPA ORD, 2007 recipient; Ron Falta, Clemson University, 2012 recipient; Matt Small, USEPA Region 9; Jeff Kuhn, Montana DEQ, 2012 recipient; and Jim Weaver, USEPA ORD.