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L.U.S.T.LINE

A Report on Federal & State Programs to Control Leaking Underground Storage Tanks

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Tale of the Terrifying Tank

By Mark Junker

This story could be a Russian epic: "All happy tanks are alike, but every unhappy tank is different in its own way."

It could be an adventure: "Have fun storming the tank pit!"

This tale is rooted in science and philosophy, as the needs of the many outweighed the needs of the few. Nevertheless, this is a horror story. Like Dracula, it drained the lifeblood. While events did not unfold on Elm Street, Freddy Krueger would not be out of place. Our heads spun like a certain girl in "The Exorcist." We could have been stunt doubles for a freezer-faced Jack Nicholson at the Overlook Hotel and, like our buddy Jason, the problem never seemed to die. Our leaking underground storage tank is today just a shell of itself, but it has passed on lessons that we can share.

The Sac and Fox Truck Stop is not the typical backdrop for macabre theatre, but on July 16, 2015, a series of events began that left the small Tribal Nation on the Kansas-Nebraska border questioning its sanity. It was a perfect Monday evening, with clear skies colored by one of those purple-orange sunsets that contrast the deep-green stalks of corn and the carpet of soybeans that make up the majority of the landscape between Topeka and Nebraska City.

Amanda Kramer, an assistant manager at the time, was captaining the truck stop that evening when the automatic tank gauge alarmed at 9:30 p.m. She immediately checked the ATG in the back room. Sandwiched between heavy, stacked boxes of concentrated soda products, the LED readout indicated water in the fuel. Her spot-on response was to hit the emergency shut-off, stopping any more product from flowing to the six dispensers on the west island of the truck stop. As she walked out the doors to notify the customers, a vehicle leaving the service island coughed, sputtered and died. The driver struggled to restart his car, to no avail.

Another patron tried to start her vehicle and it too was unable to turnover. In all, six vehicles were impacted by a yet-to-be-determined problem with the gas. Summoning her resources, Kramer brought in the Tribal Council and the Kickapoo fire and rescue squad. The Sac and Fox Truck Stop actually sits in a tiny cut-out of the Kickapoo Tribe of Kansas' reservation and their response team is headquartered just eight miles away. The concern now shifted to what caused the alarm. Rising high above the darkened stretch of glacial till, anchored just 200 feet from the tank pit, a 7,000-gallon water tower emblazoned with the Sac and Fox logo seemed to be the logical culprit.

The initial assumption was that a main feeding the Brown County Kansas Rural Water District's tower had failed, and water was somehow breeching the tank system via one or more of the utility lines within or adjacent to the tank basin.

Excavated, exposed, extracted and accompanied by the backhoe that lifted it from the pit, the failed tank sits only a few feet to the east of the hole from which it emerged. The delaminated ribs are fairly obvious on the right side of the tank.

L.U.S.T.Line

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Shrouded in smoke from a controlled burn the Sac and Fox conducted in a nearby field, one of the removed tanks bears the scars of sampling done to evaluate the tank wall material for defects.

A flurry of activity ensued as travelers whose cars had broken down were fed and boarded in nearby towns and their vehicles were towed to shops throughout the county. Water and electricity were both shut off at the truck stop and as night fell on the plains, a visual inspection of the tanks began in earnest. A flashlight down the fill ports of the three tanks located south of the truck stop revealed nothing to the eyes, but an audible rush echoing from the four-inch fill port confirmed water was indeed entering the tank.

It took another couple days for all hands to get on deck. Water-seeking paste on a measuring stick confirmed that only a small amount of ethanol-blended gasoline remained floating on top of a mid-grade tank that once held 7,500 gallons of product. One of the first calls made was for a pump and frac tank and those arrived on July 21. The giant, red fractioning tank with a capacity of 33,000 gallons was placed to the south side of the tank pit and, by the end of the day held 19,000 gallons of water, gasoline and dissolved ethanol.

The source of water entering the tank was not drinking water destined for the tower or water from the tower feeding the truck stop and casino. It was obvious through process of elimination that the source was groundwater, but the mechanism for it getting into the tank was still unknown.

As the frac tank filled higher, a fellow from Tanknology arrived with a camera which he would use to determine the cause of the problem. Visibility was not great, but after several false starts and four hours of running the camera down all the tank's openings, a picture emerged in sepia tones. Several feet to the east of the tank's submersible turbine pump was a pile of gravel. Dimensions were difficult to calculate in this skewed perspective. The 12,000-gallon tank seemed vast, and distance is illusory when viewed through a tiny lens dangling from a fiberoptic fishing line.

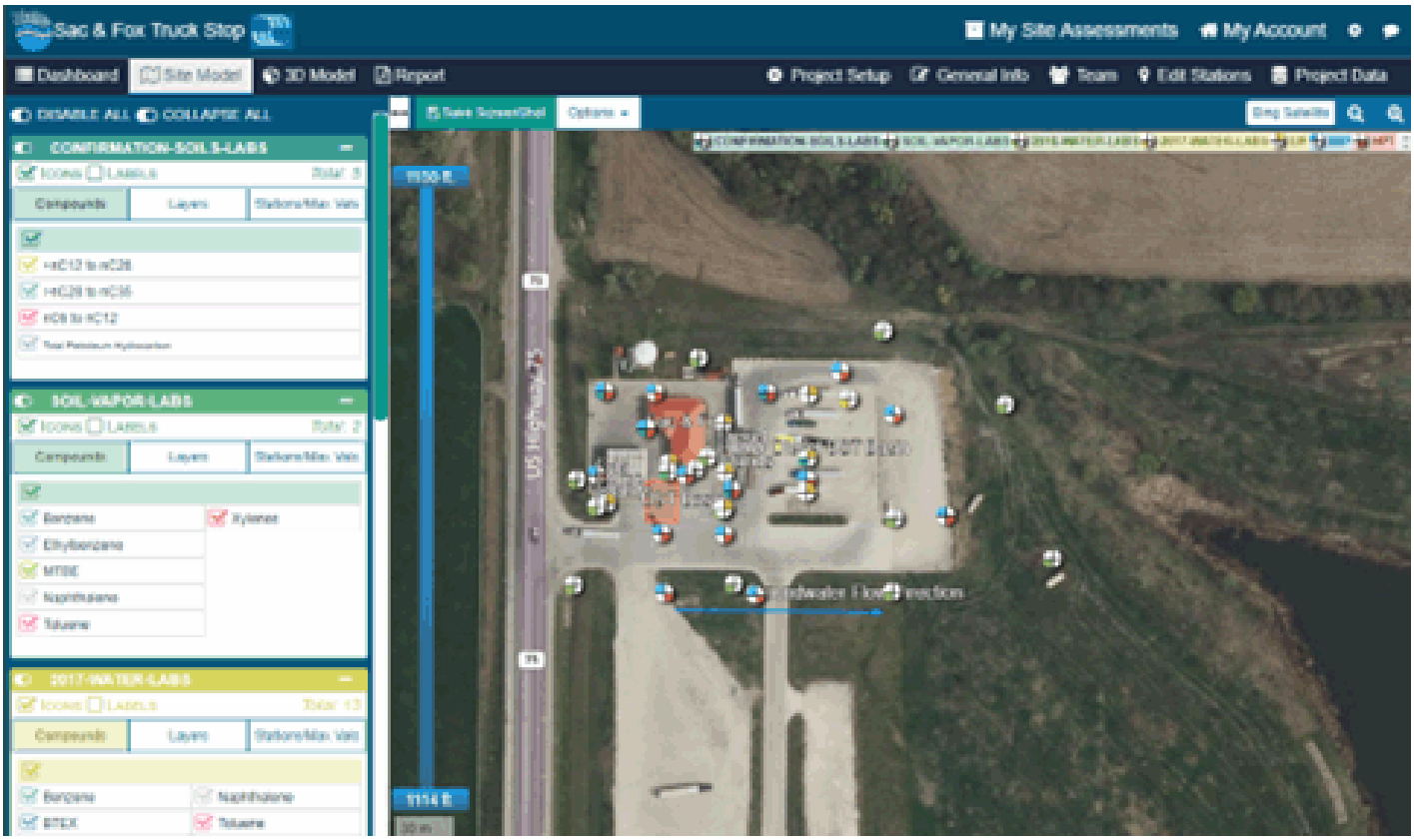
The process of reading the images and obtaining an expert opinion took about two weeks. Eventually, it was calculated that the pile of gravel was about six feet long and two-and-a-half feet high and composed of the same pea gravel that was the recommended material used to fill the voids in the pit when the tank was installed.

Two other tanks shared the pit, and Tanknology determined that the failed tank was the northernmost one. The tank professionals also suggested that the middle tank be taken out of service due to its proximity to the failed tank and the instability of that particular side of the tank pit. The third tank was deemed stable enough to continue and the truck stop was able to continue selling fuel. However, operations were now becoming a bit constricted. A small fortress of gray, Lego-like cement blocks cordoned off the area surrounding the tanks. Typically, this was a key access point for customers entering and exiting the pumps and the store itself. Within a month, a second frac tank joined the full one, which would soon be joined by a third. With each new rain, the pump pulled more water from the pit. Each new investigation resulted in a fresh reconfiguration of the block maze. By November, five fresh monitoring wells dotted the property and a conceptual site model emerged.

Additionally, several off-site issues conspired to slow progress. The insurance company questioned expenditures and denied claims for actions taken in the immediate aftermath to protect human health and the environment. The decisions made by the experts brought in were second-guessed by the underwriters and progress was almost nonexistent.

Since the first picture of a gravel pile emerged from the abyss, it was assumed that a repair to the failed part of the tank would be the obvious remedy. These were original tanks installed in conjunction with the grand opening of the Sac and Fox Casino in the wake of the Indian Gaming Act in 1999. So, while the tanks were by no means new, the opinion was that a repair would be the fastest, most-efficient option to get the site up and running at full capacity. Tankers were making two deliveries a day, as the one tank left in operation was struggling to handle the throughput.

Records of the original tank install were nowhere to be found and the Tribal leader most associated with the new construction had journeyed on. Elders and long-time employees alike seemed to recall Xerxes tanks being ordered, but no actual invoice could be retrieved. Those were heady times back then, as operators throughout the country clamored for



An aerial image and conceptual site model show the location of the monitoring well and bore holes that provided the data.

new tanks in reaction to new EPA regulations. Xerxes had no record of tanks being sent to Sac and Fox, but assigned a technician to be on- hand, along with an insurance company representative and a dozen other folks who had a dog in the fight when the pit was opened.

Fifteen months after the first engine flamed out under the canopy, the concrete cap above the tank pit was attacked by yellow iron and jackhammers. The eight-inch slab slowly gave way to the natural overburden. The product lines and utility trenches emerged as concrete rubble was carted off. The natural overburden and the gravel came into view and men with spades carefully excavated the engineered tank nest. Each shovelful brought hope of seeing the sweet curve of the buried behemoth. Progress was measured in small, painstaking spadesful as a cold December wind and leaden sky chilled the spectators.

Two hours in, a void appeared beneath one of the shovels and hands reached out to finally touch the muddy brown surface of the tank. Rubbing away the dust and grime, the great white whale at last revealed herself. That's right: white.

Not the bullseye red of the Xerxes brand. Maybe it had been bleached; perhaps some re-dox process involving minerals in the ground water had discolored it. The pace quickened as more and more surface area was exposed. At last, the serial number and manufacturer of the tank was laid bare for the world to see: "CONTAINMENT SOLUTIONS, TULSA OK."

The gathered crowd was dumbfounded save the Xerxes tech who, knowing his work here was done, left the scene before the noon whistle had finished announcing lunchtime.

Work ceased until a new set of players could be briefed and readied for battle. This time, there would be no repair. The sarcophagus had betrayed its condition enough that it was determined no human power could restore it to functionality. A new tank would replace it.

When finally removed from the pit, the full nature of the tank's demise became evident. Six ribs had become delaminated. It turns out a single-walled tank had been substituted for the original design when timely delivery would forestall the grand opening of the truck stop and casino. Ironically, just two days after it was discovered to not be a Xerxes tank, a clerk delving through some old Tribal Council records in a storage area found some Polaroids of the original tank install. A filing glitch had cost us nearly two years, but fortunately no more than that.

The battle commenced again, but now on two fronts. On the first, data was collected as to why the fiberglass delaminated and on the other, the goal of developing a useful conceptual site model was rejoined. In addition, cleanup of free product never ceased. Over 100,000 gallons of contaminated water was shipped off to Indianapolis for treatment and nearly 2,500 gallons of fuel were recovered floating on top of the frac tanks. Monitoring wells were dug in earnest, 25 boreholes were drilled for membrane interface probes, and our understanding of the site evolved as, over the next 18 months, data was collected and analyzed.

If there is a bright spot in this saga, it is that the site has virtually no receptors. The pond due east of the parking lot is for stormwater retention, and the impacted soil is far below where anyone will come into contact with it.

What was discovered through old-school monitoring wells and high-resolution site characterization techniques is now well understood. The quick response and subsequent recovery actions resulted in all but approximately 400 gallons of the original 5,500 gallons being accounted for. The

An array of blocks used to control traffic to provide safe access to the site.

remaining product is trapped in a source area and plume that, like the work done up to this point, is moving slowly: the rate is estimated at 50-200 feet per year. Monitoring wells 300 feet from the source zone are still non-detect. The product is trapped between clay layers in sand at a depth of 12-18 feet. There is no data supporting any vapor intrusion even though the entirety of the truck stop's south wall sits on the north edge of the source zone. The reason the tank failed is known, but we do not speak of it.

There are a number of ways that this site can now achieve closure. Each has merit as well as reasons for disqualification. Excavation in the source zone would deal a fatal blow to any plume migration but is costly. It would also shut down business for up to a month; create the additional headache of land-farming contaminated soil; consume fuel to power the digging machines, ferry workers and trucks; and arguably create more pollution than it actually cleans up. Cost estimates vary depending on the size of the hole but range from $400,000 for a 50-by-50-foot pit to $1.2 million for a 100-by-100-foot gouge out of the earth. At one time, bioremediation and a semipermeable membrane each had their allure, but once again cost, and the tradeoff between pollution created versus mess cleaned, give reason for pause.

The source zone is being depleted and the product is naturally attenuating. What has yet to be determined is the actual rate at which this process is occurring. As we enter the seventh year of this ordeal, everyone invested is eager to see some sort of resolution. Like Fred and Velma, the insurance company has long since parted ways with the Tribe and the Sac and Fox, in true Scooby Doo fashion, are wandering around in a sometimes comical — but thankfully no longer sinister — drama that will come to a resolution and final cleanup action plan soon.

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A Columbia Technology field tech inserting the membrane interface probe into a bore hole.

ITRC Petroleum Hydrocarbon Workshop

By Tom Fox
https://itrcweb.org/itrcwebsite/teams/training/hydrocarbon

Since 2014, the Interstate Technology and Regulatory Council (ITRC) has published three technical guidance documents to address hydrocarbon-impacted sites:

- Light Non-Aqueous Phase Liquid (LNAPL): "LNAPL Site Management: LCSM Evolution, Decision Process and Remedial Technologies."
- Petroleum Vapor Intrusion (PVI): "Fundamentals of Screening, Investigation and Management."
- Total Petroleum Hydrocarbon (TPH) Risk Evaluation: "TPH Risk Evaluation at Petroleum-Contaminated Sites."

In 2021 and 2022, the ITRC Hydrocarbons team created a workshop, "Effective Application of Guidance Documents to Hydrocarbon Sites," to help practitioners avoid the inefficiencies that occur when these documents are not used concurrently. Common data gaps include:

- Unnecessary field mobilizations.
- Delays in characterizing risks.
- An inaccurate conceptual site model (CSM).
- Delayed or inaccurate remedial decisions.

This new four-hour workshop provides a high-level review of concepts presented in the ITRC documents and a guided tour of each one's contents. Then, one of five exercise scenarios are presented for the class to work on in small breakout teams. The teams are encouraged to avoid data gaps by using all three documents holistically and comprehensively. Each exercise requires teams to report their conclusions to the group and discuss alternative approaches and best practices for site assessment.

So far, this workshop has been presented at the September 2022 National Tanks Conference and at the October 2022 AEHS-East Coast conference. Each workshop session had 20-30 participants and the feedback was overwhelmingly positive. Several states have inquired about offering these training sessions for their staff.

ITRC trainers continue to improve the class offerings and materials. The ITRC Hydrocarbon Training is flexible in format and can be offered either virtually or in-person, on request. While the team finalizes its website, you can learn more by emailing itrc@itrcweb.org. We hope to see you soon!

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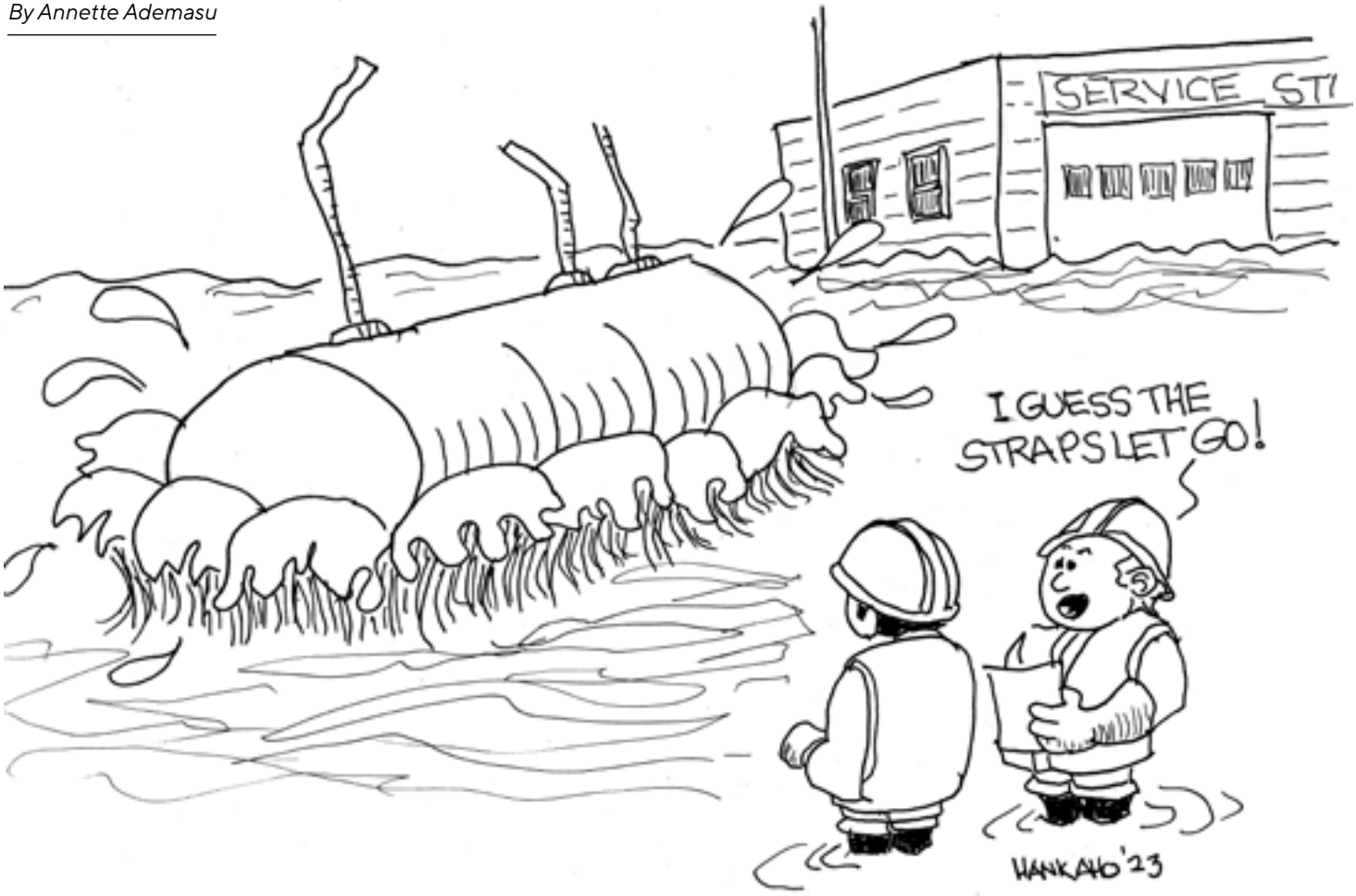
Lessons Learned: Takeaways for UST Inspectors from Washington's Unprecedented Flooding Event

By Annette Ademasu



In November 2021, Washington state experienced a wind and rainstorm that resulted in mudslides and flooding that turned rivers into lakes. The storm took some UST owners by surprise, as UST systems that had not previously experienced flooding were submerged underwater for several days.

Floods pose significant risks to UST systems. Floodwaters can saturate soil and fill up tank nests, which may result in the tanks becoming buoyant. When this happens, piping and/or the tank itself can be damaged and release fuel. More often, floodwaters can cause water to enter tanks and ruin fuel. When floodwaters recede, the head pressure against the tank disappears which, if there is already tank or piping damage, can raise the risk of a leak that will contaminate the environment.

For a small business, losing all the fuel in a tank is a huge loss. A station with three tanks — each containing 8,000 gallons of ruined fuel — would lose $100,000 in fuel alone, which is not covered by insurance. Of course, flooding also causes many other problems: water damage to buildings, electrical damage, and damaged convenience store products that must be thrown away. Small mom-and-pop businesses are often owned by people whose first language is not English. This can add another layer of stress, making it harder to navigate services for getting their business back up and running.

Prior to 2010, dealing with a flooded underground fuel tank in Washington was much simpler. The gas and water were not good at mixing, so after a flood, the water layer could simply be pumped out from under the fuel, and what was left was still useable product. Post 2010, things got more complicated due to adding up to 10% ethanol (E10) in gasoline. The main concern is with "entrained water" in the fuel, which may not show up on leak monitoring equipment or when sticking the tanks with water finding paste. Ethanol is water loving and if enough water gets into a tank, the ethanol and water drop out of the fuel to the bottom of the tank (phase separation). The fuel portion may no longer meet fuel quality standards and becomes unusable. For example, 84 Octane gasoline is blended with 10% ethanol to make 87 Octane. So, if the ethanol phase separates under the gasoline, the gasoline portion is ruined.

Wednesday Nov. 16 - Iowa St., Bellingham.

Flooding can result in sediment entering sumps and fills.

During the Washington flooding, I focused on starting with a brief 15-minute data gathering field visit to each site. Boots on the ground, one-on-one with owners was an effective way of sharing information on actions to take, rather than communicating over the phone or emailing information. Being sensitive to owners who are in shock from trauma during and after a significant flood event is vital. Many are short-staffed and busy shoveling out sediment from the stores and throwing away ruined food and materials. Focus on listening to their needs and providing simple recommendations to protect their tanks and fuel.

As flooding becomes a frequent concern due to more extreme weather

An example of cement collapse post-flood.

patterns caused by climate change, we would like to share some of the lessons learned in Washington about how to best keep UST systems safe before, throughout, and after a flooding event.

Going forward, I am interested in learning from others' experiences with floodwaters and USTs. Please contact me at annette.ademasu@ecy.wa.gov if you have information to share.

Recommendations for UST Inspectors:

There is quite a bit that UST inspectors can do to help make sure gas station owners are prepared for a flooding event and respond appropriately afterword.

Before a flood:

- Obtain flood maps of your area and review them to locate and document UST sites that could be prone to flood events. Individuals can view flood maps online in the FEMA flood map service center.
- Create a pamphlet for UST owners relating to floods outlining potential risks to USTs due to flooding and steps that owners can take to mitigate risk and respond correctly to floods when they happen.
- Distribute your pamphlet during routine compliance inspections, especially at flood prone sites. Talk with owners and operators directly about what actions they can take during a flood.
- Introduce yourself and get to know peers at your fuel quality agency (i.e., Department of Agriculture) in advance so that you have known contacts for communication during a flood emergency.
- Talk with flood-experienced contractors to learn actions owners can take to make their tanks more flood resilient. Keep this contact information up to date, as you may need to contact them during an emergency.

During a flood event:

- Be available to answer calls throughout the flooding. Reach out to site owners and contractors regarding flooded tank sites in the area.

After floodwaters recede:

- Be aware that owners will be experiencing trauma, shock, and will be overwhelmed. Using consideration, empathy, and listening goes a long way. When in the field assisting owners, keep it simple and brief.
- Gather UST system status information including fuel and water levels, sensor status, leak test status, damage to UST system components, and damage to the tank pad.

Recommendations for Site Owners:

Before a flood (preventive maintenance):

- Listen to the top suggestion from service providers: inspect gasket condition on the fill and probe caps frequently. A good gasket seal is paramount — if it is worn or corroded, replace the cap. Doing so can save you thousands in ruined fuel.
- Inspect the drain valve on spill buckets and replace them if needed. A leaky drain valve can allow floodwaters to enter your tank.
- Conduct a pressure decay test on each tank (even diesel) to find vapor leaks. These vapor leaks may be where floodwaters enter tanks.
- Take detailed photos of your tank pad, including cracks, raised areas, depressions, etc. Continue to look for changes from year to year. Spray white paint over any cracks on the tank pad and take photos. Check and photograph the tank risers — they should be vertical.

Prior to Flood Evacuation:

- Take an inventory printout to document gallons of fuel and if water is present.
- Turn off the power to turbines and dispensers.

After floodwaters recede:

- Print inventory report and check water levels to determine if tanks have water. Compare the fuel level with previous printout to determine if fuel was released from a tank.
- Stick tanks with a water finding paste (use a solid thin layer and keep stick in the tank for one minute).
- Inspect the tank pad looking for new cracks, newly raised areas, and new depressions. Take photos and compare with the photos taken previously. Check the tank risers — are they slanted? If so, the tank could have shifted underground. If there are changes, contact a service provider to investigate the UST system for buoyancy issues.
- A vacuum truck service provider can remove liquid and sediment from sumps and spill buckets; there will be a lot of sediment everywhere! Never use a shop-vac or other sparking equipment at the tanks as gasoline vapors can cause explosions.
- If there is water in a tank and there are no buoyancy issues:
  - A service provider should promptly vacuum out the water, wait 24 hours, and vacuum the water again. Water along the tank ullage and in fuel needs time to collect at the bottom, which makes vacuuming the tank twice is important. Vacuuming the first day after the waters recede is also important, to lessen risk of phase separation.
- If fuel has phase separated (fuel/ethanol/water layers) and there are no buoyancy issues:
  - Contact your fuel quality agency (i.e., Department of Agriculture) for advice on fuel quality.
  - A service provider can vacuum out bottom layers, wait 24 hours, and then vacuum layers again. The Department of Agriculture may require field sampling of the fuel using a bacon bomb, an instrument which can sample from the bottom to the top of the tank to determine if further actions are needed to meet fuel quality (i.e., flashpoint, octane).
  - Do not empty the entire contents of the tank if there is evidence of compromised tank backfill, washed away pea gravel, or if the tank pad is undermined. First, have a certified tank installer survey the tank, piping, backfill, and tank nest water levels to determine when and how to ballast the tank and remove fuel.
  - If fuel is ruined and there is no evidence of a ballast problem, a service provider can vacuum out all the ruined fuel from the tank.

To lean more about mitigating risks of flooding to UST systems, please refer to EPA's Underground Storage Tank Flood Guide.

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Tips from contractor: When removing a probe adaptor, you may hear a vacuum. During a flood, if the probe cap gasket is bad, a vacuum can create a siphon effect and draw water into the tank until the water is below the lip.

Tips from businesses: Elected officials working with the federal government will need to give dollar losses to the federal government to make a determination if the losses are FEMA eligible. Keep all flood damage receipts for losses to date and current work being done. Also include any estimates for future work costs for repairing floodwater damage.

California Stalled LUST Case Initiative Turns 5

Kenneth Dixon & Matt Cohen

Since 2018, EPA Region 9 and California State Water Board have closely collaborated to spur progress at some of the most challenging LUST cleanup sites in California. A true federal-state partnership, the Stalled LUST Case Initiative makes creative use of EPA grant funding to reduce the LUST backlog, with significant results.

The California LUST program completed more than 10,000 cleanups in the 10 years from 2006 – 2015. This success, however, left the most challenging cases behind. When the number of yearly completed LUST cleanups dropped to half of its peak levels by 2017, the EPA and the State Water Board began searching for a new framework to actively manage stalled LUST cases. Plans took shape to launch the Stalled LUST Case Initiative in 2018, and the California UST Cleanup Fund's scheduled sunset in 2025 lent urgency to the effort. Our agencies needed to engage responsible parties that lacked the means or motivation to navigate the LUST cleanup process, and we needed to spur progress before state funding programs expired.

The EPA and the State Water Board mined the GeoTracker database and identified 180 stalled LUST cases — approximately 20 managed by nine of the different Regional Water Board offices throughout the state. Contractors funded by the EPA's annual LUST grant to the State Water Board reviewed files and prepared case summaries to facilitate in-person meetings. The team, consisting of the EPA, State Water Board, Regional Water Board, and supporting contractor personnel, developed an action plan for every stalled case during the initial 2018 meetings. Follow up meetings have been held with each local agency three or four times per year ever since to review progress and adjust plans. Every case receives a next step, and meetings adjourn with a clear understanding of who will take that next step.

Alpine Service Station. Federal contractors properly destroying groundwater monitoring wells at a Stalled LUST Case Initiative site in Alpine, CA (October 2019). Proper destruction of site groundwater monitoring wells is often the last step in completing a LUST cleanup. Wells left in place can serve as conduits for groundwater contamination.

The team initially made a strategic decision to focus on cases stalled early in the cleanup process. Over the past five years, however, the initiative has expanded dramatically. Regional Water Board offices have consistently provided positive feedback and requested that the EPA and the State Water Board support additional cases. The team now collaborates with 10 Regional Water Board offices and two county agencies on LUST cases stalled in all stages of the cleanup process, more than doubling the project's scope to 408 cases. The state, meanwhile, saw the early success and invested heavily in the partnership by redirecting and hiring additional staff to join the team, including two attorneys who now support LUST enforcement.

The EPA, State Water Board, and supporting contractors help with stalled LUST cases in numerous ways. In addition to meeting with Regional Water Board and county offices to strategize, team members: travel to government offices to obtain historical files, conduct responsible party (RP) searches, contact RPs and their consultants directly, participate in meetings with RPs, draft directive letters, make funding recommendations, help RPs and property owners complete funding applications, evaluate work plans and remedial system effectiveness, prepare formal enforcement documents, conduct site inspections, prepare case closure evaluations, administer public comment periods, and conduct site-specific fieldwork at priority sites. Whatever is needed to spur progress or maintain momentum in stalled LUST cases, the team will do.

To secure contractor support and amplify results, the EPA now places a portion of the State Water Board's annual LUST grant funding into an interagency agreement between EPA Region 9 and the U.S. Army Corps of Engineers (USACE). Each year, with state input, the EPA prepares and manages task orders awarded by USACE, to great effect. Contractor support allows the team to quickly take on the time-consuming tasks needed to make progress at stalled LUST cases.

In five years, 165 previously stalled LUST cases have been closed with the Stalled LUST Case Initiative team's support, boosting cleanups completed by between 10 and 15 percent annually. Arguably more important, though, is the project's spurred progress with other cases where cleanups will now be completed more quickly. Beyond the cases that are now closed, the effort has prompted new fieldwork at 92 cases, and new workplans for 52 more. Public notices have been issued for 42 cases that will be closed as soon as site monitoring wells are properly destroyed. The team has shepherded 94 new applications through state funding programs and facilitated the issuance of 91 enforceable cleanup directives. Formal enforcement has also been initiated in 38 cases. Prior to

Federal contractors remove an abandoned UST as part of a two-step site assessment (January 2020) in Olivehurst, CA, across the street from Ella Elementary School. The work resulted in LUST cleanup complete.

the team's intervention, these cases had not made progress in several years or, in some cases, decades.

California considers a site to be in a disadvantaged community if its CalEnviroScreen score exceeds 75%. The Stalled LUST Case Initiative is committed to working with all regional offices across the state, but the team can and does use CalEnviroScreen scores to determine where enforceable directives are most needed, how quickly to initiate formal enforcement, and where to use LUST grant funding for fieldwork. Thirty-nine percent of all sites supported by the team fall within disadvantaged communities, including 15 of 18 sites where EPA grant funds have been used to conduct fieldwork.

Lessons Learned

- Stalled LUST cases require more time and attention to manage effectively, with regulators needing to go far beyond reviewing and responding to technical reports. In California, deploying a Stalled Case Team to share this workload with frontline case managers has proven to be an effective model. Stalled cases have been observed to relapse after initial breakthroughs, frequently enough that every case brought into the project is then discussed — at least briefly — at recurring meetings until the cleanup is completed and the case is closed.
- Regulators cannot identify stalled LUST cases and collaborate to address them without first sharing case-specific information. In California, the GeoTracker database allows the EPA, multiple divisions of the State Water Board, and Regional Water Boards to see full case files and share updates in real time. In 2018, the Stalled Case Team quickly discovered that paper files for older stalled cases needed to be scanned, uploaded, and reviewed before action plans could be fully developed.
- With limited exceptions, stalled LUST case support in California often starts with the issuance of an enforceable directive to all responsible parties (RPs). Many stalled cases have a history of RPs not responding to past directives, and extra efforts to confirm or update RP names, mailing addresses, email addresses and phone numbers are well spent. The use of paid subscription services to access accurate RP contact information has been essential to these efforts. Beyond ensuring receipt of letters, care has also been taken to build templates and craft letters that will prompt a response. The team includes property and owner-specific information to demonstrate that multiple levels of government are prioritizing the specific LUST case, and team members follow up via email or phone. Letters often present two very different options: help with relevant funding programs, or potential penalties and property liens for non-compliance. To set up future enforcement, directives set deadlines, cite appropriate authorities, and are signed by managers delegated those authorities. For many older LUST cases, current property owners have little experience with USTs or state agencies, so directives must also clearly explain the actions required, in languages other than English if necessary.
- One on one assistance to explain state UST funding programs and help with the actual applications or nominations is needed to generate progress at some stalled LUST cases. The level of assistance required in some instances would be difficult for case managers to balance with other responsibilities, so supporting contractors have been particularly helpful. In communication with the rest of the Stalled Case Team, supporting contractors work directly with RPs and property owners to prepare, submit, and track applications to the most appropriate of four state funding programs. For recalcitrant sites not suitable for enforcement, supporting contractors have similarly helped prepare and track nominations to the state's Emergency, Abandoned, and Recalcitrant (EAR) program that directs state-funded contractors to conduct LUST fieldwork and recover costs via property liens.
- Clear direction and assistance with funding programs cannot resolve every stalled case, making formal enforcement a necessary tool. A mechanism is needed to levy fines on recalcitrant RPs with ample resources to address their stalled LUST cases, and a protocol is needed to gain site investigation warrants for state or EPA contractors to directly address priority sites if needed. EPA and the State Water Board realized this and reached an agreement in 2020 to expand the Stalled Case Team. The State Water Board Office of Enforcement created a new LUST enforcement attorney position, now split between two attorneys also supporting other programs. Simultaneously, EPA dedicated LUST grant funds to hire a supporting contractor with LUST project management experience to help the attorneys develop cases. The enforcement team has successfully obtained one warrant, is seeking several more, and is scheduled to bring its first Administrative Civil Liabilities complaint before a Regional Water Board in March 2023. Additional cases are in the enforcement pipeline, and the credible threat of enforcement from state attorneys has prompted multiple other RPs to take action at their LUST sites.

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A Message from Mark Barolo

Acting Director, U.S. EPA's Office of Underground Storage Tanks

The Underground Storage Tanks Program...Working Towards Environmental Protection for All

The UST universe is large — as of our most recent report there are over 540,000 USTs at approximately 193,000 facilities across the country. USTs are in almost every community, but the communities closest to USTs tend to be more disadvantaged environmentally and economically. While there is no single way to characterize communitites located near UST facilitites and releases, the population surrounding our sites is more minority, low income, linguistically isolated, and less likely to have a high school education than the U.S. population as a whole.

Active UST Sites. *Data Source:* UST Finder | US EPA

Addressing the disproportionate burden that some communities have carried for decades is a major priority for the Biden Administration and for EPA. In 2021, President Biden issued two executive orders – Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (Executive Order 13985) and Tackling the Climate Crisis at Home and Abroad (Executive Order 14008) – that directed federal agencies to promote and work toward proactively achieving environmental justice. The work being done in the tanks program and other land protection and cleanup programs at EPA supports these priorities. OUST is working to integrate environmental justice considerations into UST and LUST programs and programmatic decisions. We aim to increase focus and attention in areas with potential environmental justice concerns and to consider cumulative environmental impacts on disproportionately impacted communities.

> "whether by conscious design or institutional neglect, communities of color in urban ghettos, in rural 'poverty pockets', or on economically impoverished Native-American reservations face some of the worst environmental devastation in the nation." – *Professor Robert Bullard*

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice will be achieved when everyone enjoys the same degree of protection from environmental and health hazards, and the same degree of access to environmental decision-making processes. This is a goal that challenges and inspires us as we work with our many partners to implement the UST program.

EJScreen – Environmental Justice Screening and Mapping Tool – provides high-level data in a composite index that helps to improve understanding of the impacts to communities from UST/LUSTs, other environmental indicators, and socioeconomic factors.

Open LUST sites. *Data Source:* UST Finder | US EPA
Note: KY does not have any observations because their datadid not indicate which releases were closed or active, so they are excluded from the map.

So, what can we do about it? Fundamentally, we need to work to address environmental justice concerns and to factor this issue into our programs and decision making. Environmental burdens vary widely, even within a short distance. We need to identify which communities are facing a disproportionate burden. Then, we need to consider how we can enhance our program to further protect those vulnerable communities. There is no one way to determine which community is facing disproportionate burdens, but we and our many partners have tools we can use to help narrow down our focus. To this end, EPA developed EJScreen. Many states also have mapping and other tools that we can learn from and adapt to develop a methodology that works for us. We recognize that our many state and tribal partners have no shortage of work to do. Our hope is that EJ concerns will be incorporated into the existing UST program goals and workload.

To identify some options for better integrating EJ into our programs, OUST worked with several regions and states to pilot various approaches. As a result of those pilots, we identified a number of possible approaches. A few example options include:

- As an initial step, analyze the universe of UST facilities and LUST releases in your area using environmental justice criteria to identify sites in areas with EJ concerns.
- Provide additional compliance assistance to facilities and risk communication resources to nearby communities.
- Integrate environmental justice and cumulative impacts into LUST prioritization / risk ranking scheme both for oversight and direct cleanup sites.
- Look for leveraging opportunities for stalled sites in communities with environmental justice concerns, such as the recent increased investment in brownfields funding from the Bipartisan Infrastructure Law.

Different states and tribes have their own perspectives on environmental justice and even have different definitions and plans for the best way to address concerns. These differences help foster creativity and learning among us all. By working with our many partners, we can advance environmental justice and spur economic opportunity in overburdened communities. We believe that protecting and improving environmental conditions related to USTs and LUSTs is beneficial to the individual, to the community, and to the country as a whole. None of this can be done by one person or one office. We need "all hands on deck" to decrease environmental burdens, increase environmental benefits, and work to build healthy and sustainable communities.

A federal government effort related to our environmental justice focus is the Justice40 initiative. Initiated by President Biden's Executive Order 14008, the Justice40 initiative directs federal agencies to develop policies and strategies that strengthen compliance and enforcement, incorporate environmental justice considerations into their work, increase community engagement, and ensure that at least 40 percent of the benefits from federal investments

A Message from Mark Barolo... continued

flow to disadvantaged communities. The Justice40 Initiative addresses a wide range of burdens that communities face, and the Leaking Underground Storage Tank (LUST) cleanup program is covered under its goal to reduce and remediate legacy pollution. In our LUST cleanup program we are measuring the percentage of LUST sites that are cleaned up in disadvantaged communities, as defined by the White House's Climate and Economic Justice Screening Tool (CEJST). Based on a national analysis of our most recent six-month reporting cycle ending in September 2022, 42% of our completed cleanups were in disadvantaged communities. The percentage of cleanups completed in disadvantaged communities varied by state, and some states have more opportunity to increase their percentage of cleanups in these areas.

We are at an interesting time in the UST program, with significant past accomplishments, plenty of work ahead of us, and a fair amount of uncertainty and change as the transportation sector continues to evolve. As we work in the UST program to prevent releases and in the LUST program to clean up those that occur, we can have a meaningful impact in reducing the cumulative impact and environmental burdens in underserved communities. It is our privilege and a responsibility to carry this program forward and to protect vulnerable communities throughout the country by working to ensure safe storage of petroleum and hazardous substances. I hope we can continue to build on the great work you all do and to ensure that disadvantaged communities benefit from our efforts. I look forward to working and learning together as we carry the program forward by incorporating environmental justice concerns into the valuable work we do.

Visit EPA's *Environmental Justice website* for more information and resources

Risk Mitigation Tracked Through ESG Reporting

By Jeff Hove

As the Environmental, Social, and Governance (ESG) movement began to garner more headlines in the media, the Fuels Institute board formed a task group to discuss the potential impacts on those in the transport and fuels industries. Noting that the transportation sector is the largest contributor to greenhouse gas (GHG) in the U.S., our board moved forward with gathering more information, while building an application that can provide guidance and reduce costs.

What is ESG Reporting?

ESG reporting is a method for organizations to track and report their operations and risks. This method goes beyond traditional corporate sustainability reports, which consistently lack the tracking and reporting of metrics. When done properly, an ESG report will help a tank owner assess different types of risks including limiting liabilities, improving operating expenses, and both attracting new clients and maintaining existing ones. Convenience store operators engaging in ESG planning and reporting have also noted improved employee relations and an increased ability to attract new employees due to transparent reporting that often mirrors the ideologies of prospective employees.

Although ESG reporting also includes societal and company governance insights, the environmental aspect must be carefully communicated. Under this part of the reporting, the fuel marketer/fleet operator needs to create a transparent and reproducible method for calculating GHG emissions. For this reason, the Fuels Institute's ESG Integrity platform models emissions by using the Argonne National Laboratory's GREET model. The application is overseen and updated annually by third parties. It also generates individual emission reports to share with associated companies, as well as prospective business partners.

Who should consider using the ESG Application?

Creating an ESG plan does not have to be expensive or difficult. It does, however, require company leaders to get behind the process and support the objectives and outcomes and, most importantly, set goals for improving the organization.

ESG reporting is not only for large publicly traded fuel marketers and fleet owners. While privately held companies will not likely be required to create an ESG plan, they may still be asked for ESG information to support a fuel supply contract or in response to new requests for proposals on supply contracts. Additionally, family-owned marketers, looking at passing the company down, find ESG reporting to be an effective tool for understanding the company as a whole.

Starting an ESG reporting program should not feel overwhelming — a tank owner's baseline report is not intended to impress or be perfect. Rather, the baseline report is the stepping off point where risks, such as petroleum releases, are recognized and goals for improvement designed and implemented. If ESG planning and reporting continues to gather momentum, these reports may become important in future property transactions much like the Phase II environmental site assessments.

Bottom-Line Benefits

Pursuit of an ESG plan is not solely to appease investors and banks. A company can also accrue tangible benefits by pursuing these goals.

An expanding amount of research concludes that "a strong ESG proposition correlates with higher equity returns

from both a tilt and momentum perspective."[1] A review of more than 2,000 studies on the impact of ESG planning and equity returns concluded that 63% revealed a positive correlation, compared to 8% whose findings were negative.[2]

There is a growing body of evidence that connects ESG to demonstrated value benefits and financial returns:

(1) Cost reductions

By adopting ESG principles, particularly those related to sustainability, companies will inherently reduce their energy, water, and raw material costs, with one study pegging the impact at 60% of operating profits. The same report revealed:

- 3M has saved $2.2 billion since introducing its Pollution Prevention Pays program in 1975.
- A water utility is saving $180 million per year as it focuses on energy consumption, among other initiatives.

These results are both intuitive and measurable. Consider an LED lightbulb, for example. Research has evaluated the performance and energy costs over the lifetime of a bulb and a user can extrapolate the results to their operations. This is a more concrete way to evaluate cost savings.

(2) Minimize regulatory and legal interventions

Committing to ESG values can reduce government and legal interference: "A stronger external-value proposition can enable companies to achieve greater strategic freedom, easing regulatory pressure. In fact, in case after case across sectors and geographies, we've seen that strength in ESG helps reduce companies' risk of adverse government action. It can also engender government support."

On average, one-third of corporations are impacted by state action, from 25%-30% for pharma/healthcare companies to 50%-60% for banks.[3]

(3) Increased productivity

Companies that demonstrate strong corporate social responsibility can stimulate employee productivity, while increasing the retention of favored employees. An analysis of the companies that were featured in Fortune's "100 Best Companies to Work For" found that they generated up to a 3.8% higher stock return annually compared to their competitors over a 25-year time span.[4]

Recent studies have concluded that employees at companies that demonstrate a commitment to social issues express higher job satisfaction and a stronger motivation to act in a "pro-social" way.[5] In terms of enterprise-wide productivity, "social, environmental, and governance responsibility (to all stakeholders) appear to be important as a competitive factor of the modern firm."[6]

(4) PR boost

When tied to relevant and timely industry news, a strategic public relations effort that highlights a company's ESG efforts can generate valuable media attention. They help distinguish between greenwashing efforts and those that detail compelling and meaningful initiatives.

A study of the messaging that companies distributed in response to the COVID-19 pandemic showed that "firms experiencing more positive sentiment on their human capital, supply chain, and operational response to COVID-19 experienced higher institutional money flows and less negative returns."[7]

(5) Increased access to capital

Companies that offer a thoughtful ESG plan increase their appeal to lenders. Greater transparency around the materiality of ESG issues will increasingly affect access to capital and asset values in high-risk sectors. A growing landscape of sustainability standards and disclosure requirements, that exposes financial flows to greater scrutiny and oversight, is expected to start having more influence on investment decisions at all levels, from banks to asset managers to consumers.[8]

At least one expert quantified the access value, associating a higher ESG score with a 10% savings on capital costs. That expert stated that "The risks that affect your business, in terms of its license to operate, are reduced if you have a strong ESG proposition."[9]

(6) Increased access to bidding

Companies looking to earn contract bids from public and private companies may fare better with a strong ESG posture. Green procurement, the sourcing of goods and products that are environmentally friendly, is becoming increasingly common. Local, state, and federal government organizations may require suppliers to demonstrate sustainable practices, and private companies may limit responses on their requests for proposals to those who offer some type of sustainability value proposition.[10]

(7) It's simply the right thing

Finally, companies may pursue an ESG agenda because it aligns with their ethical and moral values. This may be intrinsic in the company's mission or ancillary to its other pursuits.

Either way, embracing practices that preserve and protect the environment, stand up for social issues, and adopt an inclusive governing body help drive corporate decision-making and contribute to the company's identity and brand.

Looking Ahead

Global policymaker opinions on climate change issues have been bolstered by investment groups demanding access to sustainable investment options. In response, the majority of the world's major financial institutions, who collectively control assets of $130 trillion, have begun requesting that publicly traded companies provide information on E, S, and G metric impacts along with written goals for improving all three in the coming years and decades. Investor groups are looking for transparency in business practices that go beyond the traditional reporting provided by publicly traded companies.

The depth of ESG reporting is already touching fuel marketers and fleet operators as the publicly traded companies begin to demand emissions data from engaged organizations. Much of this data will be included in the company's ESG report. As transportation makes up 33% of man-made greenhouse gases, fleets are increasingly being required to report their emissions under shipping agreements or for internal agency reporting. Demands for low carbon fuels (primarily higher blends of biofuels) are growing as the U.S. fleet recognizes this is the most immediate path for emissions reductions. As tank owners know, offering higher blends of biofuels takes planning and a strong fuel quality program.

Fuel providers are critical to maintaining the economy and our everyday lives. Maintaining tanks, lines and dispensers is a full-time job, but new demands are being put upon the fuels industry. Driven by climate change impacts, electrified transportation is part of the solution to curbing greenhouse gases. Liquid fuels and combustion engines, however, will be around for decades. Electric vehicle (EV) adoption will not occur equally across the U.S. and charging infrastructure will likely not be installed in areas where EVs do not exist. It is imperative that during this time of transition we do not overlook rural and disadvantaged community needs.

ESG practices and expectations are quickly evolving, making any corporate plan subject to ongoing review and analysis. No matter your industry or practice area, those looking to pursue an ESG initiative can expect more ambiguity than clarity.

Retailers and marketers must understand the ESG scope and requirements of the companies they supply or represent, assessing how their actions impact the ESG reporting of the companies they supply or represent.

Inaction is no longer a viable option. Remaining silent when it comes to ESG speaks volumes about a company's perceived values. If you have not yet paid attention to ESG, the time is now.

The public is watching. What you say — and do — can make a world of difference.

The Fuels Institute is a non-profit cross-industry group focused on all matters related to fuels and transportation related issues. The Institute does not take positions on legislative or regulatory matters. The Institute creates peer reviewed research on current issues such as fuel quality and transportation emissions reduction. All research goes through a rigorous peer review process. The primary task of the Institute is to recognize barriers to progress and provide unbiased research focused on overcoming those barriers.

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NEIWPCC

NEWS & RESOURCES

New Tanks Staff Member

NEIWPCC has a new tanks program manager — Lillian Zemba came to NEIWPCC in July of 2022. Prior to starting at NEIWPCC, Lillian worked as an environmental scientist at the Rhode Island Department of Environmental Management (RI DEM) in their tanks program. While at RI DEM, Lillian conducted UST compliance inspections, managed LUST sites, and worked with the state fund to process LUST site reimbursement claims.

National Tanks Conference Presentations

The 27th National Tanks Conference was held in Pittsburgh, Pennsylvania in September of 2022. The conference was a great opportunity to meet other tanks professionals in person and offered incredible workshops and presentations. Programs and presentation slides can be viewed in NEIWPCC's NTC archive. Additionally, the following sessions were streamed and are available to view online:

Site Assessment I: Bedrock Sites

The session provides information regarding quantitative High Resolution Site Characterization (qHRSC) consisting of soil and groundwater sampling to evaluate the horizontal and vertical extent of LNAPL in saturated soil. The data collected from the discrete soil and groundwater sampling provided information to assist in choosing optimal injection locations and groundwater remediation design. Using results from LUST sites in the desert southwest, geophysics data for conceptual site model (CSM) development, plume mapping, and the geophysical response to natural attenuation is demonstrated.

Site Assessment II: High Resolution Site Characterization

This session provides case studies highlighting strategies for site characterization methods to refine the conceptual site model. This session enforces the importance of relevant physical and chemical data. Case studies highlight technologies and techniques to apply scale-appropriate investigations, measurements, and sample density to define contaminant context and distribution, with greater certainty to provide and support more effective site cleanup, and lessons learned.

Emergency Power Generator (EPG) UST Systems: One of The Last Frontiers

This session provides an overview of the federal UST requirements applicable to emergency power generator UST systems and highlight two recently posted EPA publications specific to these UST systems. It discusses the wide variations in system designs as a result of application of inconsistent design standards. This session also discusses certain complexities that are inherent to EPG UST systems such as having an UST or AST with delivery pipe going underground only to enter a building to fuel gensets, and/or boilers and the presence of atypical components such as different types of pumps, filtration systems, and complex controls. Learn what to look for and how to test sites like these to ensure regulatory compliance and safe fuel delivery.

UST Removal Time

This session addresses the massive challenge to Underground Storage Tank (UST) and Leaking Underground Storage Tank (LUST) programs of a wave of aging UST systems nationally. How big of an issue is it, really? What does it look like in terms of national data, and from the inside of a 30+ year old system? Most states don't yet require older UST systems be removed, so this session communicates how some states have attempted to limit their downsides and require or encourage the removal of older UST systems through various regulatory, compliance assistance, or funding approaches. What did they do, and what did they learn? What lessons might be helpful for your own state?

UST/LUST Webpage Updates

Over the past few months, there have been updates to NEIWPCC's UST/LUST webpages. Both the LUST Site Management and UST Inspection and Release Prevention webpages now include webinar libraries that allow for easy access to resources. The updates make it easier to find webinars like the recent Air Sparge, Soil Vapor Extraction, and Dual-phase Extraction at LUST Sites or more vintage videos like Tank Closure Without Tears – An Inspectors Safety Guide (a video produced by NEIWPCC in 1987.)

L.U.S.T.Line Updates

L.U.S.T.Line has two new staff members, Lillian Zemba and Cheyenne Ellis, who are collaborating to curate and edit articles. They are excited to join the team and bring forth new issues of L.U.S.T.Line.

NEIWPCC will continue providing the quality and character of content that readers have come to expect from L.U.S.T.Line over the past 38 years, while adding a few updates that make the articles easier to find. This L.U.S.T.Line issue is available in two formats. It can be viewed as a PDF, with all articles in one document or in a blog-style format, where each article is available as its own webpage.

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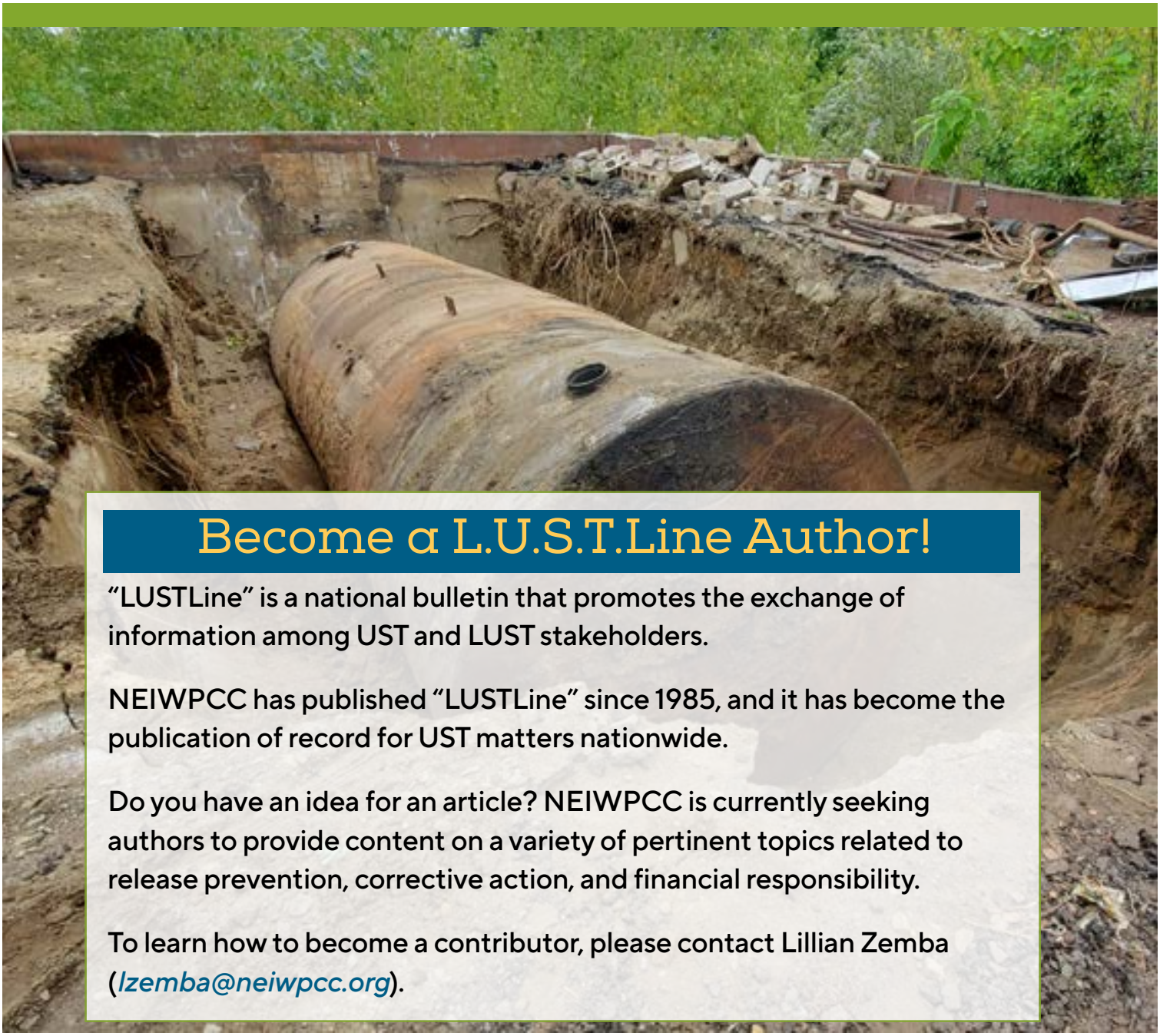

Become a L.U.S.T.Line Author!

"LUSTLine" is a national bulletin that promotes the exchange of information among UST and LUST stakeholders.

NEIWPCC has published "LUSTLine" since 1985, and it has become the publication of record for UST matters nationwide.

Do you have an idea for an article? NEIWPCC is currently seeking authors to provide content on a variety of pertinent topics related to release prevention, corrective action, and financial responsibility.

To learn how to become a contributor, please contact Lillian Zemba (*lzemba@neiwpcc.org*).