

# L.U.S.T.LINE

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



## Tanks at Ground Zero

by Karen Gomez

On September 11, like many others, I watched with disbelief as the World Trade Center buildings collapsed. In dealing with the sheer horror of this attack and the human tragedy, I recognized that there was still a need to address the environmental aspects of this event. Within the first few hours following the tragic collapse of the World Trade Center buildings, I, like many other New York State Department of Environmental Conservation (DEC) staff, was summoned to the DEC command post to assist in the agency's response efforts. As an engineer responsible for DEC's spill response and petroleum and chemical bulk storage programs on Long Island, I was asked to focus on these same issues as a preliminary assessment of the damage was conducted.

### World Trade Center Response Petroleum Bulk Storage Tank Inspections for WTC Area

#### Legend

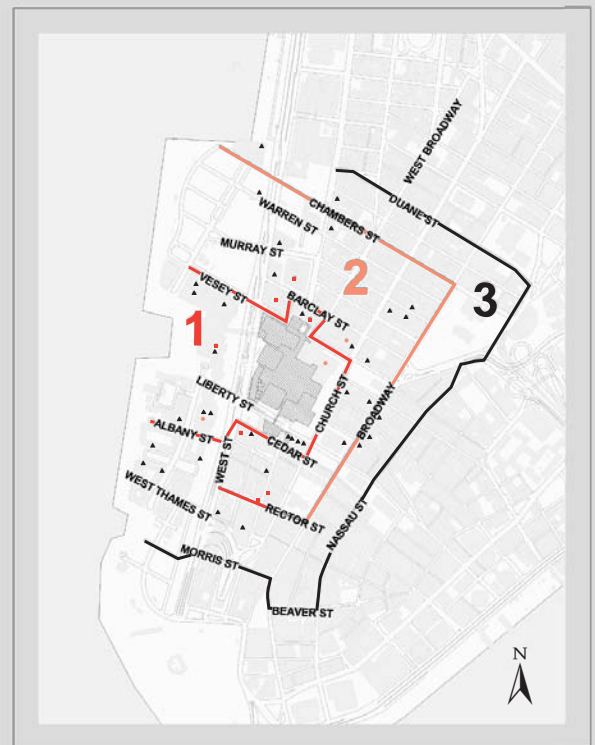
- Inspection Zones
- Zone 1
  - Zone 2
  - Zone 3
- ▲ Inspected Petroleum Bulk Storage Facility
- Spill Associated With Tanks Identified at Inspected Facility
- Spill NOT Associated W/Tanks Identified at Inspected Facility
- Area in which tanks cannot be inspected due to debris and/or damage

Facility locations are approximate



N.Y.S. Department  
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Map created by DIS GIS Unit  
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## Inside

- 4** When MTBE Struck Pascoag, RI
- 7** UST Owner/Operator Education in FL, CA, and OR
- 8** Natural Attenuation: Is Dilution the Solution?
- 13** Do Monitoring Wells Monitor Well? Part I
- 17** Is MTBE off the Hook in Europe?
- 21** New UST Leak Detection Web Site Now Available
- 22** Maryland Completes Study on Environmental Effects of MTBE
- 23** What If Tank Operators Knew How to Operate Tanks?
- 26** Qs and As: Microbes and Fuel Systems
- 28** Mississippi Seeks Input on Cathodic Protection Document
- 29** Will Congress Lay Down the Law on USTs?
- 30** Industry Gives the Nod to S. 1850

## ■ Tanks at Ground Zero

*continued from page 1*

### An Assessment Strategy

The seven buildings in the World Trade Center complex were either destroyed or partially collapsed. In addition, several other buildings adjacent to the World Trade Center suffered major structural damage. Based on the earthquake-like force of the catastrophic collapses of the buildings, we believed this destruction had the potential to cause structural damage to chemical and petroleum bulk storage tanks and systems in the vicinity of the site.

We concluded that a high priority in DEC's response effort would be to use the department's resources to identify and assess bulk storage systems to prevent further collateral damage from releases from those tanks, and in so doing, protect the health and safety of the recovery workers and the environment.

In the weeks that followed, I was given responsibility for coordinating

the development and implementation of a plan to assess the structural integrity of the bulk storage tanks and associated systems in proximity to the World Trade Center. DEC's response was intended to prevent and alleviate immediate and future releases of hazardous substances or petroleum that could threaten the health and safety of recovery workers and the public or further impair the environment.

***The World Trade Center complex had a storage capacity of more than 80,000 gallons of petroleum, and the adjacent buildings had a storage capacity of more than 170,000 gallons of petroleum.***

Working with my colleagues, I developed a phased approach that prioritized inspections in areas that had received the most structural damage. The inspection areas were divided into three zones (see map on cover) within an area encompassing approximately one third of a square mile around the World Trade Center.

To assess the extent of damage within a short period of time, we established percentage goals for tank inspections in each zone to coincide with the extent of building damage in each area. The goals were as follows:

- **Zone 1** The area in which buildings collapsed or suffered major structural damage—100 percent inspection.
- **Zone 2** The area in which most buildings were damaged but stable—50 percent inspection.
- **Zone 3** The area in which a few buildings were damaged and stable—25 percent inspection.

This phased approach provided us with the opportunity to continuously evaluate the inspection results within each zone and adjust percentage goals for tank inspections accordingly.

Utilizing the state's tank registration database and the New York City Fire Department's database, we developed a list of storage tanks

within each zone to allow DEC to efficiently and accurately assess the condition of the storage tanks and associated piping. These databases were critical for developing the plan; however, we could not rely on them alone as they did not always include small unregulated tanks.

### Implementation

Implementation of the plan required deploying personnel within the constraints of security and health and safety at Ground Zero. With a team of trained DEC spill responders, we commenced the tank inspections in accordance with the plan during the first week of October. The inspections focused on structural damage assessment, which included the following:

- Inspection of fill pipes, product piping, and vent pipes for damage and functionality
- Inspection of tanks for leaks, damage, or stability problems
- Inspection of electronic monitoring systems designed to register leaks and failures

When the inspector identified any damage to the tank or system, DEC advised the tank owner to make the necessary repairs and take any necessary precautions. If there was a release from the tank or system, DEC advised the tank owner to initiate a cleanup or made arrangements with the U.S. EPA to utilize one of their emergency contractors to empty the tank and initiate cleanup.

### Findings

Initially, DEC inspectors made slow progress in completing the inspections, due to security, accessibility, health and safety issues, and the recovery activities at Ground Zero. By early November, however, DEC had completed inspections of 84 tanks ranging in size from 275 gallons to 20,000 gallons at 42 buildings. All of the tanks contained either fuel oil, diesel, or kerosene, which was used for heating purposes or as fuel for backup generators. There were no regulated gasoline tanks since there were no fueling facilities in this area of Manhattan.

Except for 18 underground tanks, all of the tanks were aboveground within the buildings. In Zone 1,



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Ricki Pappo, *Layout*  
Marcel Moreau, *Technical Advisor*  
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Ronald Poltak, *NEIWPCC Executive Director*  
Lynn DePont, *EPA Project Officer*

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NEIWPCC  
Boott Mills South, 100 Foot of John Street  
Lowell, MA 01852-1124  
Telephone: (978) 323-7929  
Fax: (978) 323-7919  
lustline@neiwpc.org



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*DEC inspector on top of a 20,000 gallon tank that was crushed by the partial collapse of a building.*

except for 6 of 12 tanks in Buildings 1 and 2 of the World Trade Center, DEC inspected all of the buildings and associated tanks.

DEC inspectors identified three tanks in two buildings that were damaged as a direct result of building collapses; two buildings with three tanks with piping damage; and two buildings with eight tanks with the fill and/or vent pipes that could not be inspected because they were buried by debris—these will be tested before being put back into service. In addition, one of two chiller plants containing Freon was damaged in Building 1 of the World Trade Center—the EPA made arrangements to recover the remaining Freon from these plants.

In Zone 2, DEC completed inspections of 63 percent of the tanks. DEC inspectors identified two buildings that had two tanks with piping damage. For Zone 3, based on an evaluation of Zone 2 findings (only two tanks out of a total of 34 tanks with piping damage), we concluded that further comprehensive inspections were not necessary. Instead, as DEC routinely follows up on minor spill incidents in buildings in Zone 3 (and buildings in Zone 2 that were not inspected), spill responders will be inspecting all tanks and appurtenances.

### Follow Up

Except for one building that suffered minor piping damage, all of the tank and piping damage were in buildings that collapsed or suffered major structural damage. Building owners have already initiated or completed repairs of any tank or piping damage. The inspection results indicated that there were very few tanks that were damaged in Zone 2; however, as a precautionary measure, DEC contacted owners of storage tanks that it did not inspect in Zones 2 and 3 to advise them to independently inspect their tanks and piping. Tank owners were instructed to notify DEC for a follow-up inspection if they discovered piping or tank damage.

While conducting the tank inspections, DEC inspectors also checked buildings and the surrounding areas for other spills that were not associated with tanks. The inspectors discovered and followed up on hydraulic spills from elevator shafts, minor spills associated with recovery operations at Ground Zero, and a significant spill from the electric substation beneath Building 7 of the World Trade Center, which contained more than 100,000 gallons of transformer oil and dielectric fluid.

### Upon Reflection

Standing at Ground Zero and looking at the immense destruction surrounding the World Trade Center complex, it seems incredible that the damage to the tanks and piping was not greater. The World Trade Center complex had a storage capacity of more than 80,000 gallons of petroleum, and the adjacent buildings had a storage capacity of more than 170,000 gallons of petroleum. However, the World Trade Center destruction damaged only three tanks with a combined storage capacity of 32,000 gallons and caused small to moderate spills from five additional tanks with piping damage. Overall, the storage tanks and their piping suffered very little damage.

I completed my assignment in November; however, spill responders from the New York City office continue to deal with spill-related matters at the recovery site. ■

*Karen Gomez is the Regional Spill Engineer with the Region 1 (Long Island) office of the New York State Department of Environmental Conservation. She can be reached at [kjgomez@gw.dec.state.ny.us](mailto:kjgomez@gw.dec.state.ny.us)*