

Remediation In Mansfield, MA

Tiny Particles — Great Solution

By Joanne Ray -- New England Construction, 3/9/2009

It is busy at the job site these days at 271 Branch Street in Mansfield, MA, where Compo Chemical Company has their work cut out for them initiating a multimillion-dollar cleanup.

The 26-1/2 acre site has a new owner — Jarrett Laraway from International Risk Group, LLC from Littleton, CO. Laraway's group specializes in cleaning up environmentally contaminated brownfield sites and returning them to productive use.

Laraway said his first order of business is to get the 1 contaminated acre of the site cleaned up ASAP so groundwater monitoring can verify that the cleanup is complete.

"Under the Massachusetts Contingency Plan, we need one year worth of clean groundwater data," Laraway said.

The site is zoned for light industrial and residential use, and Laraway plans to redevelop the site as a benefit to the community. Although he has not yet decided what he will build, he hopes to have a project under way by July 2010.

ENSR — a global provider of environmental and energy development services to industry and government — is on site as general contractor and manager of the remediation. According to Mary Beth Hayes from ENSR, the soil at the Mansfield site had a lot of metal debris.

The company manufactured adhesives from 1948 to 1988. Back in the 1940s and up until the 1970s, industrial wastes generated from operations were disposed of in the landfill. The site formerly had 11 buildings that were demolished, and the property stood vacant.

Studies of the landfill on the site found a presence of volatile organic compounds (VOCs) in the groundwater and soil, with polychlorinated biphenyls (PCBs) also in the soil. PCBs are man-made and are typically oily liquids either colorless or light in color. VOCs evaporate in open air but may remain underground for a long period of time. Industrial wastes generated from operations were disposed of in the landfill. Benzene, toluene, ethylbenzene, and xylenes (BTEX), components of many consumer products such as unleaded gasoline, have also been found on site.

Since 1995, Compo has completed several environmental studies of the landfill. Since that time, Compo has also been operating a system to treat the VOCs in the groundwater to prevent any migration from the Compo property. On the site, an "air-sparging" barrier was installed to intercept the VOCs in groundwater, which caused the chemicals to transfer from the water to the air. The landfill is now covered with a 1-1/2-foot soil cap that prevents exposure to contaminants in the soil.

The cleanup is designed to eliminate exposures to these chemicals by skin contact, inhalation or ingestion by removing them from the soil and groundwater. The crew will work six days a week to remove the chemicals.

The project involves:

- Excavation of approx. 14,000 cubic yards of soil containing VOCs and PCBs.
- On-site treatment of approximately 7,000 cubic yards of soil.
- Backfilling all treated soil at the site.
- Treatment of any water collected as part of the dewatering activities for the excavation.
- Off-site disposal of any debris removed during soil excavation.

To aid in the cleanup, Hilltop Enterprises is on site with a Thermally Enhanced Soil Vapor Extraction (TEVE) that will remove the VOCs from excavated soil.

Jim Weglin from Hilltop explains that the TEVET process used on the site consists of a soil pile constructed with excavated soil, air distribution piping and an impermeable membrane cover. The major components of the system are a vapor blower, an air recovery blower, a burn chamber, and a catalytic reactor bank. The entire unit is custom built into a 24-foot enclosed trailer.

The process includes an impermeable membrane liner with a perimeter curb that is placed on the ground. Contaminated soil is placed on the liner. The initial lift of soil is approximately 1 to 3 feet thick. Heated air distribution piping is then positioned on top of the initial soil lift.

The second lift layer is approximately 3 to 4 feet of contaminated soil. Heated air distribution piping is then positioned on top of the second soil lift.

The final lift of contaminated soil is approximately 1 – 3 feet thick. The treatment soil pile typically contains approximately 1,000 tons of contaminated soil. The dimensions of the soil pile are typically 40 feet wide by 80 feet in length.

On top of the soil pile, vapor recovery piping is installed to collect the emissions that emanate from the soil pile. The soil pile is then covered with the same impermeable liner material, which serves to limit the emission of VOCs and prevents infiltration of moisture and provides a dust control measure. Heated air is then blown into the soil pile, volatilizing the contaminants as it passes through, then exits the pile through the vapor extraction piping.

The collected vapors are then passed through a burn chamber where contaminant destruction occurs. The burn chamber operates at 1,800 degrees Fahrenheit with a residence time of 0.5 seconds. From the burn chamber, the air is re-injected into the soil pile.

Ten percent of the air stream is exhausted through three catalytic oxidizers man-folded in parallel in a 4-inch exhaust stack or another appropriate scrubbing device, further assuring that contaminants or particles are not released to the atmosphere.

Controlled, heated air is injected into the soil pile at a temperature ranging up to 750 degrees F and at 3,500 cubic feet per minute. Based on these operating conditions, the soil temperature can be elevated from ambient temperature to between 150 degrees F and 450 degrees F. The soil is treated at these conditions until cleanup objectives are met, which typically occurs within seven to 10 days.

At the end of the process, soil samples are collected and analyzed to verify that remediation objectives have been met. Also, continuous air monitoring of the extracted vapors ensures that proper destruction is achieved and that air emission limits for the exhaust are not exceeded.

Also on site, laborer Chris Rickard is assisted by the operator of a Deere 644E while laying the aluminum pipe on the soil that will eventually back into the furnace to start the cleaning process. Some of the soil is also passed through a MCB512R soil processor that breaks and fluffs up the soil.

Elsewhere on site, laborers from EG Northeast, the general environmental contractor performing the excavation and material handling work at the site, are building a roof over four 20,000 gallon frac tanks that filter out water through a hose and into hay bales and then into the wetlands.

"The water goes through bag filters that remove the sediment," Hayes explains. "It goes into a granular activated carbon that removes VOCs and is discharged into the wetlands."