The RIGHT Choice

For Waste Treatment

Property developers appreciate the benefits of S/S, including the ability to treat and reuse material on site in a cost effective cleanup that is protective of human health and the environment.

Augusta Manufactured Gas Plant Cleanup Using Cement-based Solidification/Stabilization

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Before the widespread distribution of natural gas, city dwellers used "town gas" to light streets, cook meals, and heat and illuminate homes. Town gas or manufactured gas was produced through a process of heating coal. Due to the short distances necessary for distribution of the gas, manufactured gas plants (MGPs) were commonplace in U.S. cities from the 1830s until the 1950s.

Most MGP facilities included buildings and equipment to heat coal and fixtures called gas holders to store the gas produced. The process of heating coal and extracting gas also generated byproducts that included coal tars, oils, and other organic and inorganic compounds. These substances often impacted the soils and typically remained after the closure of the MGPs. Former MGP sites are frequently located within city limits and provide developers an opportunity for brownfield redevelopment of the properties.

The process of brownfield redevelopment begins with cleaning up past releases at the sites. Cement-based solidification/stabilization (S/S) is being used increasingly in the redevelopment of former MGP sites. S/S involves mixing portland cement into impacted soil. S/S technology protects human health and the environment by immobilizing hazardous constituents within the treated soil. The treatment prevents human and animal exposure and migration of the constituents into the environment. The mixing process used during S/S treatment can be done on excavated soils or it can be done in place (*in-situ*).

PCA Portland Cement Association

Augusta Site

Cement-based solidification/stabilization treatment was recently completed at a former MGP site in Augusta, Georgia. The site is adjacent to a residential area near downtown Augusta. The 1.8-acre parcel of land treated by S/S was the former location of the MGP operating facilities and gas holders, which were in use from 1852 to 1955.

Byproducts from the manufacture of town gas impacted soil on this parcel. The depth of impacted soil ranged from just under the surface to 30 feet below ground surface. The impacted soil is considered a source of groundwater contamination for the surrounding area. Cleanup plans for impacted soil above the groundwater table included excavation and off-site disposal. The groundwater table at the site was approximately 10 feet below ground level. The layer of impacted soil above the groundwater table was excavated and transported off site for disposal at an industrial landfill. Approximately 48,000 tons of site soil was excavated and disposed.

Cleanup plans within the shallow groundwater saturated zone included solidification/stabilization of the soil. An established treatment technology protective of human health and the environment, S/S treatment was approved for the Augusta site by the Georgia Environmental Protection Division. S/S had already been successfully used in the cleanup at other former MGP sites in Georgia. At the Augusta site, S/S was selected for the shallow groundwater saturated soil to enable remediation to be completed in a shorter time and to minimize heavy truck traffic, with its risks and inconvenience, through the community.

After the surface soil was removed, S/S treatment began. The shallow groundwater saturated zone was located approximately 10 feet to 30 feet below the original ground surface. A soil mixing auger was used to inject and mix portland cement into the soil. The 10-foot-diameter auger was run down through the soil. The auger had a hollow stem with auger flights equipped with nozzles. Cement-based grout was injected into the soil. The depth of auger mixing continued through the shallow groundwater saturated zone and into a few feet of the soft fractured rock zone beneath. An overlapping pattern of mixing "columns" insured complete mixing and treatment of the area.

Within the treated area, tar-like source material in the impacted soil was solidified in place. S/S changed the physical properties of the treated soil, creating an impervious mass to infiltrating precipitation and passing groundwater while further inhibiting leaching and transport of source material.

Goals for S/S-treated soil at the site included: (a) unconfined compressive strength of at least 50 pounds per square inch, (b) reduction of hydraulic conductivity by 2–4 orders of magnitude compared to untreated soil surrounding the site, and (c) durability of the treated mass for hundreds of years, based on wet-dry cycling and compressive strength tests.

The number of brownfield sites utilizing S/S treatment is increasing. Property developers appreciate the benefits of S/S, including the ability to treat and reuse material on site in a cost effective cleanup that is protective of human health and the environment.

This project sheet includes information from *Augusta Manufactured Gas Plant Cleanup and Canal Reconfiguration Project, Community Briefing Book*, January 2003, Atlanta Gas Light Company, available at http://mgpfacts.com.

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