

Project: In Situ Stabilization of MGP Impacted Soils

Client: Major Utility Company

Location: New Jersey



Panther Technologies, Inc. (Panther) completed a 34,500 CY In Situ Stabilization (ISS) Pilot Study project at a former Manufactured Gas Plant (MGP) Site. The project is in the center of a gas operations facility which serves as the base operations for daily gas/appliance service work. The pilot study was performed to evaluate the effectiveness in treating MGP-impacted (VOCs, PAHs, metals) with ISS mixing of Portland cement and ground granulated blast furnace slag (GGBFS) as reagents; and to evaluate the suitability of ISS as the remedy to treat the overall 300,000 CY of impacted soil on site. The overall goal was to seek regulatory closure and brownfield reclamation in a fast-growing redevelopment community.

The project included the removal and disposal of 25,000 tons of historic fill material, impacted soils, subsurface concrete infrastructure, wooden and concrete pilings; ISS treatment of 34,500 cubic yards of MGP-impacted soil; groundwater treatment; restoration of the ISS area with certified clean fill; and the installation of a hydraulic barrier wall (HBW) around the perimeter of the ISS area. GPR, soft digging and pre-trenching the perimeter of the ISS area was completed to identify, de-energize and decommission known and unknown utilities.



The perimeter HBW and the interior of the 40,000 SF ISS treatment area was completed using excavator bucket mixing methods. To prepare the 40,000 SF treatment area for ISS, **Panther** removed remnant building and structure foundations, gas holder foundations and the support piling, tank foundations, abandoned piping and electrical conduits. Concrete structures were demolished, excavated and stockpiled within the ISS area, and shipped offsite with the historic fill. The ISS treatment area was divided into ~ 300 SF mixing cells. Based on the target depth of each treatment

sub-cell, the total quantity of grout required to complete the ISS was determined based on the reagent ratios identified in a Bench Scale Treatability report prepared by the construction oversight engineer (COE) with 3% Portland Cement and 6% crushed GGBFS by weight. Depths of the ISS treatment cells ranged from 27 feet to 42 feet below ground surface (bgs). Upon completion of ISS treatment, LSRP-approved certified clean backfill was imported, placed and compacted to 95% over the 40,000 SF area in lifts to achieve a four-foot layer of clean fill.

Panther performed testing of ISS treated soils at a frequency of 1 sample per 500 CY. All samples were analyzed for UCS and hydraulic conductivity, while one sample for every 1,000 cubic yards was analyzed for leachability (LEAF EPA 846 Method 1315). Samples were collected at areas and depths randomly chosen and alternated across the entire mixing area using a hydraulic sampling tool controlled with an excavator. Based on review of the early results, a leaner mix design was proposed achieving the required UCS and hydraulic conductivity limits resulting in a reduction of the cost for reagents, with the savings being passed on to the client.