

PROJECT HIGHLIGHT

CHARACTERIZATION AND MANIFOLD INJECTIONS AT A FORMER INDUSTRIAL FACILITY

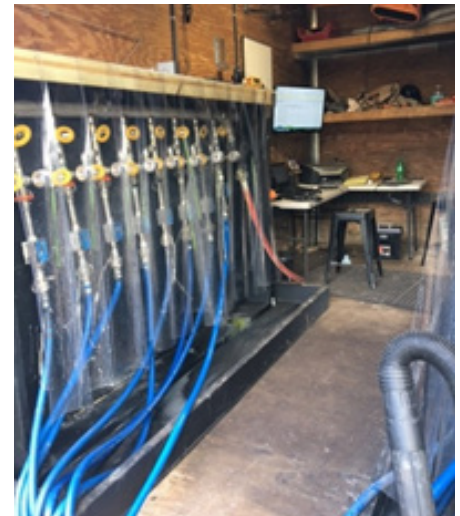
Experienced injection experts make all the difference on projects requiring custom solutions.

CLIENT: Arcadis

LOCATION: Florida

TECHNOLOGY: In situ chemical remediation via sodium polysulfide and sodium hydroxide injections

CONTAMINANTS: Zinc and nickel



PROJECT OVERVIEW

Previous operations at this former industrial facility included waste disposal into on-site ponds, resulting in contamination of groundwater, sediment and soil. This challenging site included heterogeneous lithologic conditions and a relatively shallow water table just five feet below ground surface (bgs). The client selected in situ chemical precipitation as the remedy to treat groundwater in areas defined as high concentration zones.

To support our client's conceptual site model and remedy design, Cascade performed characterization activities using direct push technology (DPT) sampling and a hydraulic profiling tool (HPT) before and after injections. The remedy design required injections at 600 locations, from 25 to 60 ft bgs. Significant challenges were encountered when Cascade initiated the first round of sodium polysulfide/sodium hydroxide injections, due to the shallow and flat water table. Since progress was moving too slowly to meet the client's needs, Cascade worked closely with the client to brainstorm a cost-effective solution, drawing from our decades of injection experience.

Ultimately, we performed injections through two, 16-point manifolds that were custom built for this project. To access 32 points simultaneously, we utilized more than 10,000 feet of injection hose, 1,000+ feet of DPT rods and 42 injection nozzles. Injections were completed in 2-foot depth increments over the targeted treatment intervals, which ranged from 5 to 45 foot bgs. Injection flow rate adjustments were frequent to manage operating pressures and delivered volumes. An average of 35 psi was maintained resulting in 1 to 5 gpm injections.

RESULTS

Although this phase of the project proceeded slower than originally planned, Cascade successfully completed all injections with minimal daylighting issues across the site. This initial phase of injections is performing as designed, achieving more than 70% reduction in average zinc and nickel concentrations in groundwater. Further reductions are anticipated with time. Additionally, Cascade logged more than 7,000 man-hours on this site without any recordable safety incidents.



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