



**“We were able to save the clients time and money by replacing a long term pump and treat system, while closing the site and eliminating ongoing O&M cost.”**

## PROJECT DETAILS

**Location:**

Southern United States

**Project Type:**

EZVI, Bioaugmentation

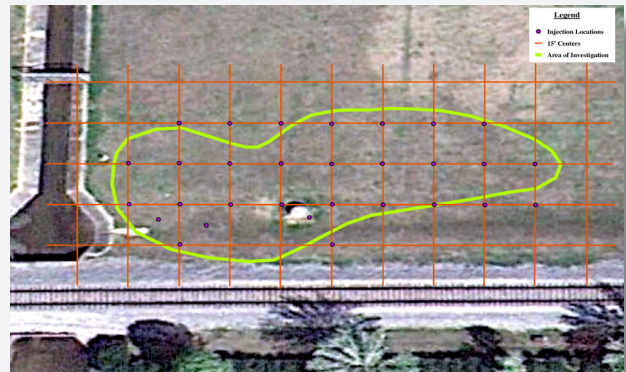
## PROJECT SUMMARY

This project was performed at a site in the Southern United States. PCE and its daughter products were the constituents of concern (COCs), and a long term (20 plus years) pump and treat system has been in place. The client's goal was to eliminate the ongoing cost of operating and monitoring the pump and treat system. This project was located immediately adjacent to an active railroad track, which presented a unique set of Health and Safety challenges that were met by TEA staff. An extensive site investigation was performed by TEA in order to determine what remediation technologies would be most effective at the site. The objectives of the site investigation were to gather information necessary to develop remedial goals and a remediation plan for the site.

## REMEDIATION PLAN

Historically, groundwater concentrations suggestive of the presence of DNAPL have been reported in Sump 1. The proposed CAP strategy to remediate the subsurface clays and pit groundwater in Pit #1 included Injection of emulsified zero-valent iron (EZVI) on top of the clay layer underlying the pit sand fill in order to treat residual DNAPL in the subsurface clays and as a result to reduce dissolved concentrations in groundwater and co-inject food grade vegetable oil (VO) and Dhc (with vcrA) cultures in order to augment the biodegradation of dissolved chemicals of concern (COCs) in pit groundwater.

PCE concentration marginally above the standard was reported in Pit #2. As a proactive and precautionary measure to prevent possible excursions above the RECAP standard in the future,



augmented bioremediation was proposed and injected of Dhc microbes (with vcrA gene) with a co-injection of food grade vegetable oil as a carbon source. A total of 21,000 gallons of EZVI, 6000 gallons of vegetable oil, 750 gallons of sodium lactate, and 30 liters of KB-1 were injected over an 8 day period using the Badger Injection System. Two separate treatment areas (sumps) were treated with 37 temporary injection points at intervals ranging from 14-24 bgs.

# THE RESULTS

Results of the first and second quarters of 2014 performance monitoring indicated that EZVI injections for Pit No. 1 and vegetable oil injections for Pit No. 2 had significantly reduced the COCs within each area. Based on the results presented herein, the following conclusions were made: Groundwater results from Sump No. 1 indicated that DNAPL and groundwater had been effectively remediated. Soil and groundwater results indicated that there was no source material left at the site. Groundwater associated with Sump No. 2 had been effectively remediated and monitoring and closure was requested by TEA. On October 21, 2016, the LDEQ issued a No Further Action letter. This letter marks the final chapter in the long remediation process of this historical site.

## POST INJECTION ANALYSIS

