



TCH Case Study: Dunn Field, Defense Depot (DLA), Memphis, TN

Project Information

At a former Defense Logistics Agency (DLA) site in Memphis, TN known as Dunn Field, which is part of the Memphis Defense Depot (a CERCLA NPL site), TerraTherm was selected by e²M to design and implement In Situ Thermal Desorption (ISTD) for treatment of chlorinated solvents in soil. The Contaminants of Concern (COC) include TCE, PCE and Vinyl Chloride. The project was funded by the U.S. Air Force (USAF).

Eight separate treatment areas covering a total of 53,000 square feet comprised a total target treatment zone (TTZ) volume of 48,000 cubic yards.

Subsurface Geology/Hydrogeology

The upper 30 ft (the TTZ) consisted of a loess deposit (silt, silty-clay and silty sand). Underlying the TTZ were fluvial sands and gravels to 100 ft bgs, over clay. Groundwater was encountered at 75 ft bgs.

Project Goals

Soil remedial goals (RGs) for the primary COCs were as follows: 1,1,2,2-Tetrachloroethane (TCA), 0.0112 mg/kg; Tetrachloroethene (PCE), 0.1806 mg/kg; Trichloroethene (TCE), 0.1820 mg/kg; and Vinyl Chloride (VC), 0.0294 mg/kg. By contrast, the mean pre-treatment concentration of TCE was 73 mg/kg. Achievement of these remedial goals is equivalent to removing approximately 99.9% of the contaminant mass.

Project Approach

TerraTherm designed and installed 367 heater wells and 68 vacuum extraction wells within the eight treatment areas, most at 17-ft spacing. The heater wells were designed to operate at



temperatures of 1,000 to 1,100°F, to achieve Target Treatment Temperatures in the formation of 195 to 230°F. The extraction manifolds from each of the eight TTZs connected to a centralized AQC system.

Air Quality Control (AQC) System

The AQC system components included an influent heat exchanger, a moisture separator, positive displacement blowers, an air drier and vapor phase GAC vessels. A cooling tower provided evaporative cooling of non-contact water for both of the heat exchangers.

Performance and Cost of the Remediation

Remedial goals were achieved at all 8 treatment areas in November 2008. TCE concentrations in soil were reduced from a pre-treatment mean of 73 mg/kg to a post-treatment mean of 0.045 mg/kg, representing a removal of >99.9%. The estimated mass removed was in excess of 12,300 pounds. Conditioning of the vapor stream before the vapor phase carbon resulted in an average absorption efficiency of 18%. The Process Equipment was extremely reliable. The overall turn-key cost of the project, including power, was \$73/cy.