

PD-680 SPILL SITE

ST-10

Joint Base Andrews

April 2022

BACKGROUND

The PD-680 petroleum-based Stoddard solvent spill site (ST-10) is located on the northwest side of the Joint Base Andrews (JBA) airfield and resulted from leaking underground storage tanks (USTs) located near a vehicle wash rack. At least two USTs have leaked PD-680 solvent and waste oil at the site. Other USTs at this site contained glycol, and JP-4 jet fuel. Each of these tanks has been removed from the site, and the glycol UST was replaced in 1997 with a regulatory compliant fiberglass UST. The only remaining UST at Site ST-10 is one 25,000-gallon fiberglass tank containing glycol. A Remedial Investigation/ Feasibility Study (RI/FS) with a treatability study has been completed and a Record of Decision (ROD) has been signed. The ROD specifies groundwater monitoring and institutional controls as the remedy. An Explanation of Significant Difference (ESD) was approved by the Environmental Protection Agency (EPA) in January 2022 to document the change in cleanup criteria for naphthalene, one of the Contaminants of Concern (COCs) at the site.

CHALLENGES

This site has already reached the status of Remedy in Place (RIP). The remaining challenges relate to the significance of arsenic in the groundwater, and occasional slight rebounds of naphthalene and benzene in one monitoring well (MW-10). This area of Maryland is known to have high concentrations of naturally occurring arsenic in the soils. Since no one is exposed to this groundwater, and because dissolved arsenic levels should decline over time, an informal agreement has been made to not address arsenic levels at this time. The Air Force (AF) and the EPA agreed to monitor the groundwater once a year for the site's contaminants of concern (COCs) - arsenic, naphthalene, and benzene. A long-term monitoring (LTM) event in September 2021 found a decline in the concentrations of the three COCs and at levels below their respective cleanup criterion.

PERFORMANCE-BASED APPROACH

Land Use Controls are currently being employed to limit any potential human exposure. In-situ groundwater treatment has been conducted by injecting Oxygen Releasing Compound into the groundwater plumes at Site ST-10. Naturally occurring bacteria populations that are starved for oxygen are then stimulated and consume the benzene and other constituents. While arsenic is a COC at this site, the total concentrations were believed to be equivalent to naturally occurring background levels. Arsenic is typically bonded to the soil particles and is therefore minimally detectable in groundwater.



Figure 1: Site ST-10 with Land Use Control Area

The original hypothesis was that the oxygen consuming microbial populations were stimulated as a result of the PD-680 spill. The consumption of oxygen by the microbes ultimately resulted in anaerobic (without oxygen) conditions in the groundwater. During anaerobic conditions, arsenic loses its bond to the soil particles, and becomes mobile in the groundwater. LTM indicates that microbial communities have degraded the petroleum hydrocarbons. It is possible that the arsenic has reattached itself to the soil particles as expected, since the arsenic levels in groundwater during the September 2021 LTM event were below the maximum contaminant level (MCL) and background levels at all six active monitoring wells. Future activities at the site under a new 2020 Optimized Remediation Contract (ORC), which prescribes continued groundwater monitoring and the possibility of additional remedial actions, if necessary, are dependent on whether or not the groundwater sampling results document the achievement of Remedial Action Objectives in accordance with the ROD. At that time, the site will be reevaluated and a path forward toward Site Closure will be decided upon.

RISK DRIVERS

Contaminants: Benzene, naphthalene, and arsenic

Impacted Media: Groundwater and subsurface soil

Exposure Pathways Completed: Construction worker exposure during excavation work

Drainage: Piscataway Creek

Current Land Use/Surface Cover: Industrial

Reasonably Anticipated Land Use: Industrial

Relative Risk: NR