

DOVER, DE - DOVER AIR FORCE BASE, AREA 5

SITE OVERVIEW

Since World War II, Dover Air Force Base (DAFB) has been a center for military air-cargo operations in the Eastern US. Degreasing solvents were routinely used in aircraft maintenance and releases were common. Area 5 was a large contaminated groundwater plume located in the northern portion of DAFB. The plume was located in a shallow surficial aquifer in unconsolidated deposits of clay, silt, sand and gravel covering 30 acres. Primary contaminants of concern were TCE, DCE and VC. Accelerated Anaerobic Bioremediation (AAB) treatment was selected in 2006 for the source areas and core of the dissolved plume.

GOALS AND CHALLENGES

Remediation cannot interfere with DAFB military operations. The existing site infrastructure (buildings, asphalt and concrete) limited access to potential substrate injection locations. Uniform substrate distribution was a challenge as the plume was located in unconsolidated deposits of clay, silt, sand and gravel.

REMEDIATION APPROACH - NEWMAN ZONE EVO

Direct injection of emulsified vegetable oil (EVO) and soluble substrate products was selected for treatment in four source areas. To reduce the number of injection points, circulation between permanent wells perpendicular to flow was used in ten biobarriers. Performance issues with other products resulted in the change to Newman Zone® emulsified vegetable oil (EVO) within the biobarriers in 2007. Newman Zone EVO provided the best substrate distribution with minimal loss of hydraulic conductivity.

RESULTS

A large reduction of plume area and contaminant mass was achieved. Increases in DCE, vinyl chloride and most importantly Ethene provided strong evidence of complete dechlorination. Many wells have shown greater than 95 percent degradation of total CVOCs.

"We use Newman Zone primarily in the permanent injection transects where we pump to circulate the water. The smaller droplet size is more mobile and doesn't clog the wells as much as other products."

Chlorinated Ethenes Over Time, greater than 500µg/L (URS, 2015)

