Base Realignment And Closure (BRAC) Program

Remedy In Place (RIP) for Former TNT Washout Plant

Todd Hornback, public affairs, and
Nora Hawk, environmental support

A determination of Remedy in Place, known as RIP, by the U.S. Environmental Protection Agency, marked a critical milestone for the Former Savanna Army Depot, Ill., allowing innovative methods to substantially complete work at four of five sites.

After the treatment of groundwater at the fifth site is complete, long-term monitoring of groundwater will continue for approximately 30 years at all the sites to ensure that groundwater quality remains protective of human health and the environment.

"We evaluate the contaminant levels each month during the summer. At the end of the year we will see if we need to continue," said Todd Knuth, Louisville District project engineer. The frozen ground deters monitoring during winter months.

Recently, the 11-acre Former 1934 Outdoor Washout Plant (Site 111), used between 1933 and 1936 to wash out ammunition, achieved RIP due to the successful construction and operation of an on-site soil flushing and groundwater treatment system.

Since 2011, the soil flushing process has been used onsite to remove contaminants from the soil and water—specifically trinitrotoluene, known as TNT.

"We have extraction wells downstream of the groundwater flow. From these wells, we pump it through a carbon filter system," said Knuth. "We reapply the groundwater upstream or on top of the areas where we believe the contamination is located. The water goes through sand within the soil and helps flush the TNT into the groundwater. Sampling is done on a monthly basis. The data is plotted to assure the TNT levels are dropping."

The U.S. Army Corps of Engineers, Louisville has worked at the site, a 13,062-acre inactive Army Installation in Savanna, to conduct Base Realignment and Closure environmental response activities since the mid 1990s.

"Before we began our flushing system, we dumped lime on the soil and tilled it in with an oversized rotor tiller," Knuth said. "That treatment knocked the TNT levels down within a month."

To date, soils at the site have been successfully treated and the TNT concentration detected at 1.8 parts per million, which is well below the protective standard of 50 ppm. Groundwater concentrations have been reduced to a point where only one of three extraction wells requires operation. Soil flushing at this area will continue until groundwater concentrations at this location fall and remain below 14 parts per billion.

USACE

At a typical treatment area, piping distributes extracted water that has been filtered through carbon vessels back to the soil to create a continuous flow of water through the soil to the ground water.

The depot was placed on the Comprehensive Environmental Response and Compensation Act National Priorities List as a "Superfund Site" in 1989, prior to its 1995 Base Realignment and Closure designation. Army operations at the Depot began in 1917 and included the intermittent handling, processing, and storage of munitions, explosives, and industrial chemicals over an eight-decade time span. As part of BRAC, the Corps conducted an installation-wide Environmental Baseline Survey that identified areas where storage, release, or disposal of hazardous substances or petroleum products or their derivatives may have occurred. This survey identified areas that required further evaluation and the Louisville District has been working since that time to assess and remediate those impacted sites.

Between 1995 and 2009, investigative and response activities at Site 111 identified elevated soil and groundwater concentrations of residual explosive compounds. These compounds posed a risk to human health and the environment. The predominant contaminant, 2,4,6- TNT, was present in soil at 3,750 ppm and in groundwater at 640 ppb.

How successful has the environmental restoration worked? According to Knuth, "Out of the five treatment areas, four were down below remedial goals within a year. The only thing left in those four areas is to remove the flushing equipment. The natural vegetation is coming back."

The project's success has also left the BRAC office giving top five-star designations to the Savannah project delivery team.

USACE

Shown here are the carbon vessels (blue tanks) that filter the water and the control center (trailer) that monitors the ground water extraction and rate of water application to the treatment areas.