MASSACHUSETTS MILITARY RESERVATION
April 2005

Air Force Center for Environmental Excellence

Chemical Spill 10 (CS-10) Groundwater Plume

Where did this groundwater plume come from?

The primary source of the CS-10 groundwater plume are spills and releases that occurred during the operation of the former Boeing Michigan Aerospace Research Center Missile Site and Unit Training Equipment Site. Other unknown sources at MMR may have contributed to the CS-10 plume. The primary contaminants in the CS-10 plume are perchloroethene (PCE) and trichloroethene (TCE), both of which are volatile organic compounds (VOCs) used in cleaning solvents.

Maximum concentrations for PCE and TCE are 101 and 1,000 parts per billion (ppb), respectively. The state and federal maximum contaminant level (MCL) for both chemicals is 5 ppb. The MCL (as listed on the plume map) is a standard established by the U.S. Environmental Protection Agency (EPA), under the Safe Drinking Water Act. It represents an acceptable level of a chemical that ensures the safety of a public drinking water supply. The Massachusetts Department of Environmental Protection (DEP) has established safe drinking water standards as well. If there are differences between federal and state levels for a given chemical, the more stringent (lower) value is applied.

What is the current status of the source area?

In 1996, 15 drainage structures were removed as part of the basewide Drainage Structure Removal Program. By November 1998, a Record of Decision was signed, which specified cleanup actions using both soil vapor extraction (SVE) and excavation and off-site disposal of contaminated soils. In 2001, over 1,500 tons of contaminated soil were excavated and taken off-site for disposal. The SVE system was started in February 2002, and over 4.7 pounds of VOCs have been removed from the soils through November 2004. Many of the original buildings have been demolished.

What is the current status of the plume?

Treatment System: The groundwater treatment of the CS-10 plume is divided into three segments: [1] In-plume; [2] Sandwich Road Fence; and [3] Leading Edge. The treatment plants use granular activated carbon to remove VOCs from the groundwater. Through December 2004, over 9 billion gallons of groundwater from the CS-10 plume have been treated. The two larger systems (In-plume and Sandwich Road Fence) are expected to operate for the next 25 to 35 years.

In-Plume: This system uses eight extraction wells and two infiltration galleries that are currently operating at 2760 gallons per minute (gpm). The system started in June 1999 and was modified in April 2000. Through December 2004, over 6.6 billion gallons of groundwater had been treated, removing almost 2,400 pounds of contaminants. In October 2004, the In-Plume system was modified by installing an additional extraction well.

Sandwich Road Fence: This system uses eight extraction wells and six reinjection wells that are currently operating at 874 gpm. The system started in May 1999. Through December 2004, over 2.4 billion gallons of groundwater had been treated, removing over 930 pounds of contaminants.

Leading Edge: An extraction well to capture the northern lobe was installed in January 2000. It currently operates at 175 gpm.

Monitoring Program: AFCEE, EPA, and the DEP continually evaluate the results of the on-going groundwater treatment through a monitoring program known as System Performance and Ecological Impact Monitoring (SPEIM). The latest SPEIM report indicated that the CS-10 treatment plants are operating successfully and capturing the CS-10 plume as designed except for an area around the southern infiltration gallery of the In-Plume system. In 2004, the In-Plume system was modified by installing an additional extraction well.

What's next?: AFCEE plans to issue a Proposed Plan for public comment on the CS-10 plume in 2006. The Proposed Plan for CS-10 involves evaluating various remedial options prior to selecting the final remedy.