

# *Radford Army Ammunition Plant*

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## **FACT SHEET SWMUs 48 & 49**

### **Introduction**

This fact sheet describes the recommended action for addressing elevated constituents in soil at Solid Waste Management Unit (SWMU) 48 [Oily Water Burial Area] and groundwater at SWMU 49 [Red Water Ash Burial No. 2] at Radford Army Ammunition Plant.

### **Background**

SWMUs 48 & 49 are adjacent to each other and are located in the southeastern portion of the Horseshoe Area. These SWMUs are situated on a bluff approximately 120 feet above and overlooking the New River.

SWMU 48 consists of two sets of unlined trenches, one at the northern end of the site and one at the southern end. SWMU 49 is a small clearing adjacent to a dirt road. There is no evidence of pits at this site and waste was likely disposed on the ground surface. Prior to off-post waste oil reclamation, approximately 200,000 gallons of oily wastewater removed from oil/water separators throughout RFAAP was reportedly disposed of in SWMU 48. However, the results of environmental sampling to date indicate that the oily wastewater was likely disposed of in the area associated with SWMU 49. Conversely, sampling indicates that the red water ash associated with SWMU 49 was disposed in the SWMU 48 disposal trenches. Because it is apparent that there was some degree of cross disposal occurring at SWMUs 48 and 49, this area was considered a combined study area consisting of both SWMUs.

Six investigations have been conducted at SWMUs 48 & 49 since 1987 to evaluate soil and groundwater at the sites. The results of these investigations are summarized below.

### **RCRA Facility Investigation (RFI)/Corrective Measures Study (CMS)**

Soil Contamination Assessment –

No analytes were detected above screening limits in 2007 soil samples from SWMUs 48 and 49. A detection of TNT above the screening levels during an earlier investigation could not be duplicated in subsequent investigations. Analysis of the chemical results from soil samples collected from the site indicate that soil is no longer impacted by the waste burial areas. Therefore, soil is not a major concern at SWMUs 48 and 49.

There were some chemical concentrations of concern at SWMU 48 and those soil areas of concern will be removed. Groundwater Contamination Assessment- SWMUs 48 and 49's most recent (2007) groundwater samples indicated that three Volatile Organic Compounds (VOCs) [carbon tetrachloride (CT), tetrachloroethene (PCE), and trichloroethene (TCE)] as well as 11 metals were detected at concentrations exceeding groundwater screening levels. The elevated metals are likely due to a high turbidity groundwater sample collected from one well on site.

Corrective Measures Study –

An evaluation of corrective measures to address elevated VOCs in groundwater was performed. Three corrective measures alternatives were evaluated based on effectiveness, implementability, and cost.

These alternatives consisted of the following:

- Alternative One: No Further Action.
- Alternative Two: Monitored Natural Attenuation and Long-term Monitoring (LTM), with additional soil investigation and possible removal at SWMU 48.
- Alternative Three: In-Situ Enhanced Bioremediation and MNA.

The corrective measures objective is to reduce concentrations in groundwater to levels that are below the USEPA's maximum contaminant levels (MCLs) as well as investigate soil hot spots further.

Alternative Two was recommended as the final alternative for SWMUs 48 and 49 because it can be readily implemented and provides a level of protection to human health and the environment not provided by Alternative One. In addition, Alternative Two has a lower cost than Alternative Three.

### **Implementation of the Selected Corrective Measures**

The selected alternative includes the following:

- LTM.
- Reporting.
- Additional soil investigation at hot spots of SWMU 48 as well as soil removal, if additional surrounding soil sample concentrations are above screening levels.

The data, findings, assessments, and recommendations are contained in SWMUs 48 and 49 RFI/CMS Report dated February 2009, reviewed by Radford AAP (RFAAP), U.S. Army Environmental Center (USAEC), U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) and the US Army Corps of Engineers (USACE). The report has been submitted for review by the U.S. Environmental Protection Agency (USEPA) Region III and the Virginia Department of Environmental Quality (VDEQ). To further characterize the extent of contamination of SWMU 48, an aggressive test pit exploration was performed in 2010. The test pitting was advanced downward and through the ash layer, thus, determining the extent and boundaries of the ash layer. Composite samples were collected and tested to determine if excavated soil contains explosive or waste characteristic concentrations above TCLP RLs. Nine explosives were detected in the soil, all below the r-SLs, with a single detection of NG that exceeded the residential criteria. Antimony, arsenic, cadmium, copper, lead, and mercury exhibited instances of i-SL exceedances. As such, the removal action at SWMU 48 was driven by metals. An Interim Measures Work Plan has been prepared to that effect and was approved by the EPA and VDEQ in July 2011. The excavation and confirmation sampling at SWMU 48 has been completed, and the Interim Measures Completion report has been submitted and is under review. An additional Interim Measures Work Plan is currently being written addressing the groundwater monitored natural attenuation planned for the sites.