

US EPA ARCHIVE DOCUMENT

RCRA Showcase Pilot Region 4

Phased Approach to Site Remediation Expedites Progress Toward Environmental Indicators and Final Remediation

**Atkemix Ten Inc. Facility
Louisville, Kentucky**

Introduction

The Atkemix Ten Inc. facility in Louisville, Kentucky, is using a phased approach to address corrective action. The first phase was the installation of a groundwater extraction and treatment system to control groundwater migrating from the former production area. The ongoing second phase focuses on site stabilization and primary source control. The third phase will be the final site remediation and redevelopment and will build upon previous remedial phases.

Background

The site is the location of a former chlorinated chemical manufacturing plant. The plant was shut down in the early 1980s and the manufacturing facility demolished. Atkemix Ten Inc. has a RCRA Post Closure permit for a former evaporation pond that was regulated under RCRA. Atkemix Ten is also under the RCRA Corrective Action program for a number of closed solid waste management units that predated RCRA regulations. The former production area has also been identified as an Area of Concern. As part of the RCRA Corrective Action process, the company has defined contamination sources throughout the site and delineated the nature and extent of the contaminant plumes for determining corrective action needs.

Over the last five years three events were occurring simultaneously that have had an impact on the development of the company's phased remedial strategy: 1) installation and operation of an interim groundwater remediation system, 2) completion of the RCRA Facility Investigation, and 3) development of the EPA Region 4 Environmental Indicator strategy to expedite schedules for attaining site stabilization.

1) Operation of Interim Groundwater Remediation System. An interim groundwater extraction and treatment system was installed at the site in 1997 to control groundwater migration toward the Ohio River from the former production area. This system consists of three extraction wells set into the outwash aquifer, an air stripper, and regenerable carbon.

Since initial operation of the system in 1997, VOC loading to the carbon from the air stripper has decreased by about 75 percent. In addition, the air stripper is operating below the design air flow rate, while treating the extracted groundwater to below permit concentrations. Therefore, excess capacity

exists in the carbon system to handle additional sources of VOC loading.

2) Completion of the Site RFI. As part of its 1987 RCRA permit, the site entered into the RCRA Corrective Action Program with a sequence of investigations and a risk assessment leading to a draft Corrective Measures Study (CMS). The RFI (RCRA Facility Investigation) was generally completed in 1999.

3) Development of Environmental Indicator Strategy. In the late 1990s, EPA Region 4 formulated its strategy for reaching positive EI determinations at sites in the Region. In Kentucky, the State has taken the lead in implementing this strategy with assistance from the EPA Regional Office.

Development of Phased Approach to Site Remediation

In late 1999, the final corrective action strategy was proposed in the draft CMS. The proposed final corrective action includes institutional controls, continued operation of the groundwater interim extraction system, low vacuum SVE in the deep coarse grained soils with high VOC concentrations, high vacuum SVE in the shallow fine grained soils, air sparging in areas of groundwater containing elevated VOC concentrations, extension of the cap at one of the old waste management units, removal and capping of sediments in a small drainage area, localized excavation and offsite disposal of soils, and capping the former production area.

In year 2000, the State provided to the company a draft EI Status memo.

The company and the State of Kentucky, with EPA input, worked together to develop the phased remedial strategy that will address short term and long term remedial goals for the site, including an approach to reach the environmental indicators (no unacceptable human exposures under current conditions and migration of contaminated groundwater under control). The Phase I groundwater remediation system, installed in 1997, has the objective of controlling groundwater migration from the former production area. The Phase II objectives include 1) meeting EI milestones and 2) primary VOC source removal. The Phase III objective is to complete remediation and redevelop the site.

Phase II is presently being implemented. This remedial phase will make efficient use of the existing remediation system and allow the company to progress to its long-term goal of final site remediation and ultimate redevelopment. Phase II consists of excavation/capping of sediments, localized soil excavation, extension of an existing landfill cover, air sparging field on the upgradient edge of the groundwater plume, air sparge curtain on the downgradient edge of the groundwater plume, and SVE in deeper soils with concentrations above interim action level.

Phase II Objective 1: Meet EI Milestones

Control groundwater migration to prevent discharge of VOCs to the River. The existing extraction system is controlling groundwater migration from the former production area. Phase II will add an air sparging/SVE curtain on the downgradient edge of the groundwater plume.

Control Human Health exposures under current conditions: Potential risk under current conditions is being addressed by extension of landfill cap, soil excavation in localized areas, and removal/capping of sediments in a small drainage area.

Phase II Objective 2: Remove Primary Mass of VOCs

Removal of the primary source of VOCs will facilitate the final remediation and redevelopment of the site. Investigation results have shown that the outwash deposits underlying the former production area contain the greatest mass of VOCs. Therefore, the production area is the primary focus of Phase II source removal. The existing regenerable carbon that is part of the Phase I groundwater treatment system has an excess 1200 cfm additional air flow capacity. In addition, the carbon has a huge amount of VOC adsorption capacity compared to the mass of VOCs that currently comes from the extracted groundwater. The production area source control system is designed to take advantage of that excess capacity.

Air sparging of groundwater in the upgradient portion of the plume will be combined with SVE in the deeper soil in the former production area to remove VOCs from both the deep soil and groundwater. Phase II also includes a small scale operation of a high vacuum SVE system to prove out effectiveness for the shallow, fine grained soils. The soil gas from the production area SVE systems will be conveyed to the regenerable carbon; treated air will be discharged in compliance with the air permit.

Sixteen deep SVE wells and fifty-eight air sparging wells will be tied into four header pipes. To make maximum use of the existing carbon system, the deep SVE and air sparging system will function within the 1200 cfm range through cycled operation of the 4 piping headers, either one or two headers operating at a time. An HMI (Human Machine Interface) system will be used to control the cycle time and the selection of a single versus dual SVE header operation.

Progress Milestones

The Phase II design was submitted to the State and EPA during Third Quarter 2001 for review and approval. Phase II construction should be completed in Fourth Quarter 2001 with system operation beginning by the First Quarter 2002. Implementation of Phase II should allow the company to meet EI milestones in year 2002.

Progress of the remediation will be monitored by semi annual sampling of groundwater wells, in-line PID/FID analysis of air stream influent to and effluent from the carbon, and air emissions sampling. Quarterly reports will be provided to the State and EPA.

It is expected that media cleanup standards will be proposed to the State and EPA in late 2002. Once accepted, the final scope of remediation can be established. After an approximately two year period of Phase II operation and depending on the progress of source removal (i.e., greater than 75% reduction in influent soil gas concentrations to the carbon), the company anticipates beginning the design for the final site remediation. The existing SVE well field and air sparge field may be expanded, while making

continuing use of the existing carbon system.

Expected Benefits from Phased Approach

This phased approach allows the company to focus on key environmental issues while going forward with final corrective action for the site. Environmental Indicators will be met in advance of the EPA-targeted date of year 2005. The phased approach allows the company to realize some economic benefits through the use of existing remediation equipment for future phases, thereby avoiding installation of oversized remedial equipment. This approach also provides for efficiencies in the remedial process by allowing the company to focus in the short term on primary source removal using well considered interim action levels while decisions are being made on final clean up levels.

Stakeholder Involvement

The company has actively worked with the State and EPA to develop the phased approach for site remediation, including addressing Environmental Indicators for a stabilized site.

The company has participated in a couple of informal meetings with members of the local community. Primary concerns appear to be related to ultimate use of the site and the short term impacts to the community by the construction, such as increased traffic in residential areas. The company is working to address stated community concerns.

Application to Other Sites

While the specific remedial technologies will vary from site to site, the phased approach to remediation is applicable to other facilities. The phased approach requires development of short term and long term goals, with a focus on the ultimate objective for the site and includes input from various stakeholders. For the company, redevelopment is the long term objective for the property. Redevelopment includes a remedial strategy for site cleanup. For this site, completion of a draft CMS with formulation of final remediation strategy was critical to development of the phased approach to ultimately reach the long term objective.

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