

C³ | Case Study: Arizona Landfill

Between 1979 and 1980, industrial and hazardous wastes were disposed of at the Site in a series of unlined pits, each of which was used for a particular type of waste disposal. It is reported based on evaluations of manifests that approximately 3.4 million gallons of hazardous liquid wastes and between 3,700 and 4,100 tons of solid wastes were disposed of in the pits at the Site. Of particular focus is Pit 1 (50 feet long, 50 feet wide and had a depth of approximately 20 ft), which accepted a mixture of organic and oil wastes. The bulk of environmental impacts to soil and groundwater at the Site are related to wastes disposed at Pit 1.

ISTR Overview

Neighborhood:
Landfill

Duration:
21 Months

Contaminants:
TCA
1,1-DCE
Freon 113

Concentrations:
20,000 mg/kg

Geology:
Coarse-grained zone: silty sand, gravelly sand, sandy gravel
Fine-grained zone: silt, clay, varying amounts of sand and gravel
Basalt lava flow
Groundwater

Gallons Treated:
5,200 (28.5 tons)

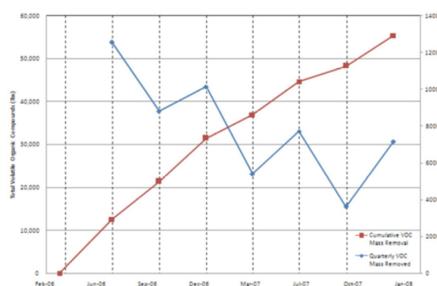


Figure 1: Cumulative and quarterly mass totals removed by the re-started SVE system from March 2006-December 2007

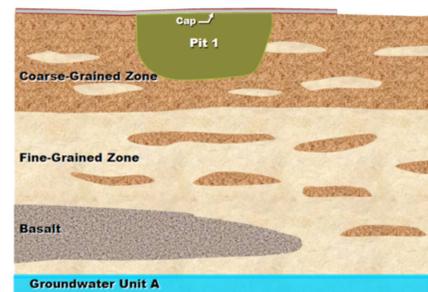


Figure 2: Geology of the vadose zone of the project site

Performance Evaluation and Results

In March 2006, eleven FGZ SVE wells in the vicinity of Pit 1 were piped into the SVE system. Initial mil vapor flow rates to the C3 technology treatment system are approximately 150 SCFM. After approximately 6 months of operation, rates of solvent recovery dropped to approximately 0.4 gallons per hour. To enhance mass removal efforts, three sub-basalt wells were piped into the SVE system in December 2006 and August 2007. Flow rates from these wells were limited due to the thin vadose zone beneath the basalt and the potential for groundwater mounding, but the product rate increased (a maximum of 0.6 gallons per hour was initially observed). In December 2007, the majority of the system vacuum was focused on select FGZ and sub-basalt wells, which had exhibited the highest VOC concentrations. During December 2007, it is estimated that the daily VOC mass removal rate increased from approximately .25 to over 0.4 gallons per hour. From 28 March 2006 through 31 December 007, a total of approximately 5,200 gallons of solvents, approximately 28.5 tons, have been recovered.

Over the 21 months of operation the vadose zone VOC plume has been significantly reduced in size and concentration. Corresponding decreases in Unit A groundwater concentrations and a reduction in influent mass to the GRS have also been observed.