

EnviroBlend[®] has extensive knowledge of the fate and transport of heavy metal contamination, as well as remedial action experience. Our scientists have spent years developing cost-effective chemistries for rendering lead, cadmium, arsenic, hexavalent chromium, zinc and other heavy metal contaminants non-hazardous. This research has resulted in a number of patented products that have been widely applied for heavy metal remediation sites across the country.

Nahant Marsh – Iowa

The Nahant Marsh site in Davenport, Iowa is a former shooting range with lead-contaminated soil and sediment. Heavy-metal contamination consisting of lead, arsenic, silver, and antimony was found in soil and sediment surrounding the five shooting platforms on-site. An additional shooting area was identified and appeared to have been used early in the history of the site. An estimated 9 tons of lead shot was deposited on the site annually for 27 years for a total of 243 tons of lead shot.

The source area was identified as the area impacted by the past shooting activities. The U.S. Fish and Wildlife Service conducted sampling of the marsh area and found up to 283 lead pellets per grab sample in sediment samples collected between 109 and 177 yards from the shooting platforms. Local waterfowl were diagnosed with lead poisoning from lead shot. Since arsenic, silver, and antimony concentrations did not exceed RCRA Toxicity Characteristic Leaching Procedure (TCLP) limits, lead was the only constituent of concern.

The remedial objectives for the site included the development and implementation of a stabilization approach to meet the Toxicity Characteristic Leaching Procedure (TCLP) criteria of 5.0 mg/L for lead, followed by off-site disposal of stabilized materials.

Through bench-scale treatability study analysis, it was determined that a 2% dosage rate by weight of EnviroBlend CS would effectively reduce TCLP-lead concentrations in the soil to below 5.0 mg/L. EnviroBlend was applied to stockpiled materials, then thoroughly mixed using conventional construction equipment. After receiving confirmational results from a certified laboratory, the stabilized material was disposed of at an off-site landfill.

The cost per treated ton on this project was \$6.75 using EnviroBlend.

Cedar Rapids Firing Range

The site is an active firing range in Cedar Rapids, Iowa, for police officer training. The backstop berm area was reconstructed to address environmental concerns with high-lead concentrations in the soil and to provide additional protection for neighboring properties.

The remedial objectives at this site were to stabilize the lead-impacted soil to meet the Toxicity Characteristic Leaching Procedure (TCLP) criteria for lead, recycle lead bullets, and restore the berm for future use.

Prior to screening lead from the berm soil at the gun range, soil was stabilized using EnviroBlend, a dry, coarse chemical delivered to the site in dump trucks. EnviroBlend was applied superficially to site areas requiring treatment, then mechanically blended into the soil using a tracked excavator. The soil was blended until a homogenous mixture was achieved. *In-situ* treatment of the soil prior to excavation allowed the material to be rendered non-hazardous prior to further management, avoiding generation of an unpermitted hazardous waste pile. Following treatment of the soil, two samples were collected for Toxicity Characteristic Leaching Procedure (TCLP) – lead analysis. The TCLP results demonstrated lead concentrations below 5 mg/L in the stabilized material.

After the soil was treated and confirmed to be non-hazardous, the contractor screened lead bullets from the soil using a MKII PowerScreen with a 3-inch upper deck and a ¼ -inch lower deck. Soil was fed into the hopper on the screen, and three material piles were generated:

- Material retained on the 3-inch screen – typically large soil clods, debris, and rocks
- Material retained on the ¼ -inch screen – expected to be lead material
- Material passing through both screens – fine soil particles

Lead recovered from the soil was to be transported to the Doe Run Resource Recovery Facility in Boss, Missouri, for recycling. Analysis of the lead-containing material screened from the soil indicated it was approximately 50% lead by weight and not suitable for recycling. EnviroBlend stabilizes soil, and the treated material is stable over a wide range of conditions and is protective of leaching to groundwater. Because of this quality, the screened and stabilized material could be used as a backfill for reconstructing the core of the backstop berm.

The total project cost for EnviroBlend stabilization and screening was \$45,000 which provided significant savings over hazardous waste disposal