REMEDIATION OF A FORMER CHEMICAL BLENDING FACILITY UTILIZING MULTIPLE METHODS INCLUDING IN SITU CHEMICAL OXIDATION AND SOIL TREATMENT

Groundwater cleanup target levels, zero-valent iron and in situ chemical oxidation via sodium persulfate injections were used in zones of contamination outside the ESAB treatment area. Within 33 months, total contaminant mass fell from an anticipated 100,000 µg/L to 10,000 µg/L.

As a result of the innovative approach taken, the project was able to achieve significant cost savings. The use of in situ chemical oxidation in conjunction with zero-valent iron injection resulted in a reduction of total remediation costs by 25%. The project was also able to meet its deadline, which was a significant accomplishment given the complexity of the site. This success story demonstrates the potential of innovative remediation technologies to achieve meaningful environmental improvements while also being economically viable.
The objective of this demonstration project was to (1) develop and validate an effective protocol to determine the presence or absence of a sewer/utility tunnel preferential pathway during a vapor intrusion (VI) investigation (i.e., is a sewer tunnel/migration of VOCs from a subsurface source causing unacceptable building impacts?). To evaluate this, a validated protocol was used to identify when and where sewer tunnel migration is occurring, and to monitor over time to evaluate the effectiveness of potential mitigation strategies to prevent continued biodegradation.

The objectives of this demonstration project were to (1) develop and validate an effective protocol to determine the presence or absence of a sewer/utility tunnel preferential pathway during a vapor intrusion (VI) investigation (i.e., is a sewer tunnel/migration of VOCs from a subsurface source causing unacceptable building impacts?). To evaluate this, a validated protocol was used to identify when and where sewer tunnel migration is occurring, and to monitor over time to evaluate the effectiveness of potential mitigation strategies to prevent continued biodegradation.
and BOD.

A review of the cost-effectiveness of the remediation of a lead-contaminated site in the Commonwealth showed that the project reduced the site's health impact for an acceptable cost according to thresholds established by the World Health Organization.

This review provides comprehensive information on biochar amendment for the remediation of persistent organic pollutants, such as pesticides. Following a brief introduction of different types of pesticides and their hazards to life forms, biochar amendment was discussed. It was noted that biochar amendment can improve soil properties and reduce pest and disease incidence. The review concluded with an overview of future research directions.

APPLICATION OF HARDWOOD BIOCHAR AS A REACTIVE CAPTIVE MATTING TO STABILIZE MERCURY DERIVED FROM CONTAMINATED FLOODPLAIN SOIL AND RIVERBANK SEDIMENT


Concentrations up to 16.4 mg/m³ were achieved with an inlet formaldehyde concentration of 14.6 mg/m³, each over a 48-h period. The plant removed formaldehyde from polluted air by 65-100%, depending on the inlet concentrations, with efficiencies ranging from 81 to >99%, and TCE concentrations from 0.66-16.4 mg/m³.

ASSESSING THE BIOAVAILABILITY OF POTENTIALLY TOXIC ELEMENTS IN SOIL: A PROPOSED APPROACH

At a contaminated site located near Baton Rouge, Louisiana, a fermentable substrate (agricultural feed grade cane molasses) was injected into the subsurface to provide electron donor for reductive dechlorination of chlorinated solvent contamination in the groundwater. This study encompassed 24 site projects containing 100 performance monitoring wells across the United States. Results that required validation included the following:

- EDTA-2Na were used to pretreat contaminated soil. The PRB contained CaAl-layered double hydroxide (CaAl-LDH) as reactive material, which captured As and Cr efficiently after EK-PRB after system startup, resulting in maximal fixed site.

- Vertical stratification in site monitoring wells based on measurements of SC, a measure of salinity. Phase I focused on investigating whether the measured vertical variation in SC corresponds to similar variation in metalloid concentrations in particular.

- Mercury (Hg) losses at and near the Y-12 National Security Complex have caused elevated levels in water and fish from East Fork Poplar Creek (EFC). DOE is using a phased, adaptive management approach to Hg remediation at E-12, with a focus on the next few years on construction of the Mercury Treatment Facility (MTF) to treat the most contaminated EFC outfall entering the creek. Once operational, the MTF will provide additional protection against inadvertent releases of Hg into the environment and will continue to work to reduce offsite and on-site Hg concentrations.

- Mercury (Hg) losses at and near the Y-12 National Security Complex have caused elevated levels in water and fish from East Fork Poplar Creek (EFC). DOE is using a phased, adaptive management approach to Hg remediation at E-12, with a focus on the next few years on construction of the Mercury Treatment Facility (MTF) to treat the most contaminated EFC outfall entering the creek. Once operational, the MTF will provide additional protection against inadvertent releases of Hg into the environment and will continue to work to reduce offsite and on-site Hg concentrations.

- Vertical stratification in site monitoring wells based on measurements of SC, a measure of salinity. Phase I focused on investigating whether the measured vertical variation in SC corresponds to similar variation in metalloid concentrations in particular.

- Mercury (Hg) losses at and near the Y-12 National Security Complex have caused elevated levels in water and fish from East Fork Poplar Creek (EFC). DOE is using a phased, adaptive management approach to Hg remediation at E-12, with a focus on the next few years on construction of the Mercury Treatment Facility (MTF) to treat the most contaminated EFC outfall entering the creek. Once operational, the MTF will provide additional protection against inadvertent releases of Hg into the environment and will continue to work to reduce offsite and on-site Hg concentrations.

- Vertical stratification in site monitoring wells based on measurements of SC, a measure of salinity. Phase I focused on investigating whether the measured vertical variation in SC corresponds to similar variation in metalloid concentrations in particular.

- Mercury (Hg) losses at and near the Y-12 National Security Complex have caused elevated levels in water and fish from East Fork Poplar Creek (EFC). DOE is using a phased, adaptive management approach to Hg remediation at E-12, with a focus on the next few years on construction of the Mercury Treatment Facility (MTF) to treat the most contaminated EFC outfall entering the creek. Once operational, the MTF will provide additional protection against inadvertent releases of Hg into the environment and will continue to work to reduce offsite and on-site Hg concentrations.
The Superfund program collects, reviews, and works with large volumes of sampling, monitoring, and environmental data that are used for decisions at different scales. This technical guide identifies best practices for efficiently managing the practices related to scoping an environmental investigation that have been developed over many years of planning and implementing investigations; and (2) it provides technical resources and references to support smart scoping activities.

Smart scoping practices can be used during any phase of a Superfund remedial investigation's project life cycle or in accordance with other similar federal, state, or tribal regulatory authorities. Use of these practices can support the development of a robust conceptual site model, which in turn helps improve response action development, selection, and implementation. Smart scoping integrates adaptive management and site characterization. Adaptive management is an approach that allows for flexibility and evolves over time based on the results of multiple exploratory actions. Smart scoping enables early and continuous improvement of decision-making as new data and information are collected and analyzed throughout the investigation process. By integrating adaptive management practices, smart scoping allows for a more dynamic and responsive approach to site characterization, which can lead to more effective and efficient remediation efforts. This technical guide provides guidance on how to apply smart scoping practices and includes case studies, examples, and references to further resources for practitioners and stakeholders involved in environmental investigations.