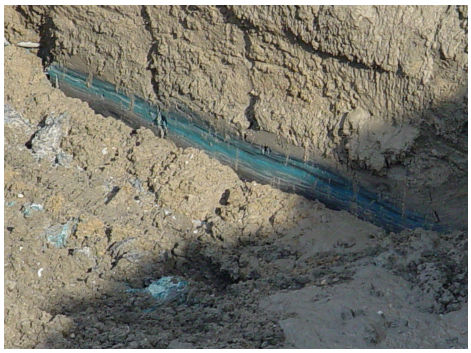
Ex-Situ Remediation of a Manufacturing Plant Drainage Lagoon

Summary: ORIN successfully treated a 5,920 cubic yard drainage lagoon with an oxidizing chemistry. Numerous contaminant levels were reduced to levels to meet U.S. EPA Toxicity Characteristic Leaching Procedure (TCLP) criteria and waste disposal facility limits. ORIN's approach saved the client approximately $2,000,000 over a dig and haul approach.



Site Characteristics:

Site: Manufacturing plant near Grand Rapids, Michigan
Geology: Clay and sand interface at 5'
Groundwater velocity: Unknown
Contaminants: 56,000 mg/kg of 1.1.1-Trichlorethane,
800 mg/kg of 1.1-Dichlorethane,
4,100 mg/kg of 1.4 Dichlorobenzene,
13,000 mg/kg of Tetrachloroethane,
190 mg/kg of Cis 1.2 Dichloroethene,
11,000 mg/kg of Methylene chloride
560 mg/kg of Trichlorofluoromethane

Remediation Approach:

Treatment chemistry: Catalyzed Persulfate (Hydrogen Peroxide & Sodium Persulfate)
Treatment application: Treatment chemical sprayed onto soil and mixed in with an excavator

Chemistries used during remediation

An initial bench level treatability study performed at ORIN's treatability laboratory found that a Catalyzed Persulfate effectively reduced the contaminant concentrations. Catalyzed Persulfate is a solution of Hydrogen Peroxide and Sodium Persulfate that is used to oxidize contaminants.

Summary of Treatment

The chemistry was designed for the oxidation of chlorinated solvents (PCE, DCE, TCE and degradation products) in the lagoon at the site. The purpose of the remediation was to lower the contaminant levels to meet the requirements of the waste disposal facility. The chemical was applied to the soil via hand held applicators and mixed into the soil with an excavator. Evidence of oxidant influence was observed during the application. The application rates varied between 5 to 10 gallons a minute. The soil was semi-saturated to oatmeal like consistency and allowed to react before samples were collected the following day for analysis. Upon receiving results, the passing soil was stockpiled for transport while the soil underneath was then ready for oxidation treatment. Each "lift" of treated soil was approximately 4 feet thick.

Effectiveness

Prior to any soil being hauled offsite, samples were analyzed and contaminant levels were below 60 mg/kg.

The Bottom Line

ORIN successfully remediated the site by applying the Catalyzed Persulfate chemistry. By treating the contaminants on site versus hauling the soil offsite to be incinerated saved the client approximately $2,000,000.

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