



### Site Overview

Empty herbicide drums were discovered in a storage shed at the site. A subsequent site investigation revealed elevated levels of 2,4-D; 2,4,5-T; 2,4-DB and 2,4,5-TP. Site-specific cleanup goals were negotiated with the Indiana Department of Environmental Management. Contaminant concentrations for surficial soils (0-2 feet) were below the cleanup goals while concentrations in subsurface soils (>2 feet) exceeded the cleanup goals. Wastes of this type are land banned in the United States. After reviewing several remedial options including disposing of the soil in Canada, the BIOX Process was selected to treat the contaminants in-situ.

### Project Specifications

- **Contaminant:** 2,4-D; 2,4,5-T; 2,4-DB and 2,4,5-TP
- **Contaminated Media:** Soil Only
- **Treatment Area:** 300 square feet  
Vertical Extent – 1' to 9' below ground surface  
Total volume – 89 yd<sup>3</sup>
- **Soil Type:** Silty clay

### Project Results

A single BIOX treatment was conducted at the site. BIOX reagents were injected inside the storage shed utilizing high velocity fluid jetting. Five subsurface soil samples were collected 35 days after the injection process. The analytical results demonstrated that the cleanup objectives were achieved and the Indiana Department of Environmental Management has deemed the remediation project complete.

#### Herbicides (mg/kg) (Subsurface soils)

Contaminant	Maximum Concentration Before Treatment	Maximum Concentration After Treatment	Reduction
2,4-D	235	6.5	97.3%
2,4,5-T	385	6.9	98.2%
2,4-DB	746	<0.0533	>99%
2,4,5-TP	404	<0.0154	>99%

**The Published Paper For This Site  
Is Available Upon Request**