EnviroBlend®
Metal Waste Treatment
BY PREMIER MAGNESIA LLC

Mining Experience

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.

Former Mining Site – Missouri

Site soils ranged from 1,000 mg/kg to 5,000 mg/kg arsenic, leaching from non-hazardous to over 30 mg/L. The soil was variable with some mine tailing inclusions. A 2% dosage of EnviroBlend CR50 was appropriate for the majority of site soils, and a 3% dosage of EnviroBlend CR50 was used for the pile/source area soils.

Leaching Results

Sample Name		EnviroBlend® Dosage		Screening Leaching Test Results			
	Lab ID	Chemical	Percentage	Pretest pH	Solution	Final pH	Arsenic, mg/L
Composite	14-02015	Untreated	-	3.57	TCLP 1	5.52	4.45
		EnviroBlend® CR50	2.0%	-	TCLP 1	5.83	0.087
Source	14-02016	Untreated	-	1.87	TCLP 1	5.50	30.7
		EnviroBlend® CR50	2.0%	-	TCLP 1	5.64	3.87
			4.0%	-	TCLP 1	6.08	0.53

Callahan Mine Superfund – Maine

The Callahan Mine Superfund Site is the location of a 150-acre former zinc/copper open-pit mine adjacent to a residential neighborhood. Charter Contracting executed remediation of OU1 to address mine contamination (lead, arsenic, and PCBs) present in the residential-use area. Lead, arsenic, and PCBs exceeded acceptable levels for human contact and long-term exposure. The mine ore pad was the source of significant groundwater contamination.

Project Highlights

- 3,000 tons of EnviroBlend was used for on-site treatment of TCLP-failed lead-mine waste prior to off-site disposal
- Metal-impacted soils were excavated and relocated from residential properties. 5,000 cubic yards (cu. yds.) of lead and arsenic-contaminated soil were removed
- 10,000 cu. yds. of PCB-impacted soils were excavated, stockpiled, characterized, and disposed of
- A total of 50,000 cu. yds of contaminated soil were excavated and staged
- 22,000 cu. yds. of ore material were relocated and installed as a multi-layer soil and geotextile cap to cover <10ppm PCBs
- Site improvements were made to minimize discharge runoff

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Evening Star and Compromise Mine RV – Montana

The Evening Star Mine in Neihart, MT, consists of mine process buildings, mill tailings, and waste rock areas, an existing repository, and a discharge at the mine entrance. The entrance discharge water originally flowed downhill to a culvert under a highway and into a creek. The culvert was filled with silt, causing water to flow over the highway at times. Removal activities at the Evening Star Mine site included systematically demolishing two dilapidated historical mine processing buildings, excavating contaminated soils from the demolished building footprints and hillslope, and excavating a catchment basin and drainage channel for routing of the mine entrance discharge water to a gulch adjacent to the site.

Approximately 3,000 cubic yards of excavated soils were hauled into the existing repository. The EnviroBlend CS product was selected as the treatment reagent for the lead-contaminated soils by the EPA On-Scene-Coordinator (OSC) after successful treatment was demonstrated in a bench-scale treatability study.

EnviroBlend CS was applied by spreading supersacks around the repository area and mixing them with the soils via an excavator and bulldozer. A total of 43 cubic yards of EnviroBlend CS were mixed with the estimated 3,000 cubic yards of excavated contaminated soils. Sample results from the contaminated soils in the repository prior to treatment and post-treatment indicate that EnviroBlend CS showed a decrease in the leaching of lead as determined by the Toxicity Characteristic Leaching Procedure (TCLP). Once the contaminated soils and EnviroBlend CS were thoroughly mixed and sampled, the repository was graded to ensure there would not be water ponding on the repository, then backfill and restoration activities commenced.

Leaching Results													
	EnviroBlend® Dosage		Screening Leaching Test Results										
Lab ID	Treatment	Dosage Rate %	Pretest pH	Pre-test Solution	Final PH	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Chrom-ium mg/L	Lead mg/L	Mercury mg/L	Selen-iummg/L	Silver mg/L
TCLP Limit	-	-	-	-	-	5	100	1	5	5	0.2	1	5
19-08015	Untreated	-	1.55	TCLP1	4.85	<0.030	0.32	0.047	<0.005	111	<0.005	<0.030	<0.005
	EnviroBlend® CS	2%	-	TCLP1	6.69	<0.030	0.20	0.025	<0.005	3.79	<0.005	<0.030	<0.005
		3%	-	TCLP1	9.45	<0.030	0.15	<0.024	<0.005	0.12	<0.005	<0.030	<0.005
		4%	-	TCLP1	9.89	<0.030	0.20	<0.024	<0.005	<0.067	<0.005	<0.030	<0.005