U.S. ENVIRONMENTAL PROTECTION AGENCY
POLLUTION/SITUATION REPORT
Michigan Smelter - Removal Polrep
Initial Removal Polrep

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region V

Subject: **POLREP #1**
Initial
Michigan Smelter
B5XF
Houghton, MI
Latitude: 47.1223147 Longitude: -88.6065189

To:
From: Elizabeth Nightingale, OSC
Date: 9/13/2013
Reporting Period: 9/9/13-9/13/13

1. Introduction

1.1 Background

Site Number:	B5XF	**Contract Number:**	
D.O. Number:		**Action Memo Date:**	8/5/2013
Response Authority:	CERCLA	**Response Type:**	Time-Critical
Response Lead:	EPA	**Incident Category:**	Removal Action
NPL Status:	Non NPL	**Operable Unit:**	
Mobilization Date:	9/9/2013	**Start Date:**	9/10/2013
Demob Date:		**Completion Date:**	
CERCLIS ID:	MIN000510458	**RCRIS ID:**	
ERNS No.:		**State Notification:**	Yes
FPN#:		**Reimbursable Account #:**	

1.1.1 Incident Category

Time Critical Removal Action

1.1.2 Site Description

The Michigan Smelting Company was created in 1903 to refine concentrated copper ore from stamp mills and prepare it for market. The plant was designed to use terraces on the nearby hillside to allow automatic feeding and economical handling of materials. The plant operated until approximately 1947, when it closed permanently. Most aboveground structures were removed around 1954. It is thought that the site was then used as a junkyard until 1984, when the current owner purchased it. The smelter originally encompassed over 108 acres; however, the focus of this removal action is the vicinity of the former smelting operations area that encompasses approximately 37 acres.

The site currently consists of two properties that each contain residential housing (the former smelter office has been converted into two rental units; the other property contains a residential home). The site also contains a pole barn/garage, open areas void of vegetation, former structure foundations, waste disposal areas, and wooded areas. Approximately eight acres of the former operations area is mostly barren with some debris piles, partial structures, tunnels, building rubble, and foundations. A smoke tunnel is quite large and easily accessible. The Bill Nicholls multi-use recreational trail crosses the property on a high bluff above the former operations area, and a creek crosses the property as well.

1.1.2.1 Location

The site is located at 17867 Canal Road in Houghton, Houghton County, Michigan, 49931 (T. 55 N., R. 34 W., Section 33). The location coordinates for the site are latitude 47.1261^{o} and longitude -88.6231^{o} at the approximate center of the former operations area. The site is situated southeast of Coles Creek Road (also known as Smelts Road) and southwest of Houghton Canal Road.

1.1.2.2 Description of Threat

The presence of hazardous substances at the site has been documented. Lead, arsenic, and copper levels in the surface soil at the site exceed both the site specific action levels (SSALs) calculated for the site and the State residential direct contact criteria (RDCC). Lead, arsenic, and copper are designated as hazardous substances under section 102 of CERCLA. Asbestos is also present on site in soils and waste materials. Asbestos is defined as a hazardous substance as defined by 40 C.F.R. § 302.4. These hazardous substances are not organized, secured, or maintained in a manner necessary to prevent exposure and/or release.

The site is bordered by a stream and is within 500 feet of Portage Lake. Leachable metals in the surface soils and below have the potential to become mobile and migrate off-site and into ground and surface waters. In addition, metals in the surface soils have the ability to be tracked into the onsite building; tracked off-site by the residents, visitors and trespassers; and spread throughout the area, into residential homes, and businesses. There is a potential for direct contact with contaminated soils because elevated concentrations of contaminants were detected in both the shallow and deep soil samples. Access to the site is not restricted and there are many barren areas with contaminated soils.

The presence of asbestos-containing waste material outdoors on the site poses a health threat to the on-site residents and to the community, especially in the event of high winds or flooding.

There is also potential for contamination of drinking water wells, as metals have been detected in shallow groundwater monitoring wells on site; most of the soils surveyed on the site have shown elevated levels of contaminants; site soils are highly permeable; and groundwater is located near the surface at depths of less than 10 feet.

1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results

EPA and MDEQ site assessments identified that levels of total arsenic and lead in surface soils were found to exceed the SSALs in a number of discrete areas within a 4-acre area, and exceed the RDCCs throughout the 4-acre area. (RDCC and SSALs for lead are 400 ppm and 5,184 ppm, respectively, arsenic are 7.6 ppm and 389 ppm, respectively, and copper are 20,000 ppm and 93,900 ppm, respectively.) In surface samples from within that area, total lead of up to 31,600 parts per million (ppm) was detected, as well as total arsenic of up to 4,130 ppm. In one area, toxicity characteristic leaching procedure (TCLP) lead was 16 ppm. Subsurface samples collected from across the site indicate minimal lead contamination below the surface. Evidence indicates that the source of the surficial metal contamination was the uncontrolled copper smelting processes that emitted plumes of particulate matter, trace elements, and sulfur oxides into the atmosphere. High levels of metals, including arsenic, lead, copper and zinc, resulting from atmospheric deposition are typically found in surface soils close to the point sources; levels decrease exponentially with increasing distance from the source.

In addition to this 4-acre area, several other discrete areas contain copper smelting waste piles with total metal levels that exceed the SSALs. These include:

1. There is a mound of soil/slag on the site locally known as the “Mercury Knob” which covers an area of approximately 900 square feet, and is 4-5 feet high. Arsenic was detected at a concentration of 2,430 ppm in a surface soil sample collected from the mound;
2. In two other hillside waste piles, arsenic was detected at concentrations of 4,970 ppm and 4,130 ppm, and copper was 41,300 ppm and 163,000 ppm respectively; and
3. Six other areas amongst the smelter ruins.

Available evidence indicates that the source of these piles and deposits is the copper smelting activities that occurred on site. Copper mining and processing is known to generate large volumes of waste rock, leach waste, tailings, miscellaneous sludges, dusts and dirt. These wastes are often piled on site. Copper processing waste piles are known to contain high levels of metals and have been found to leach metals into the environment.

Additionally, samples collected from one approximately 20 square foot area of old siding from smelter buildings were found to contain up to 10% chrysotile. This material is located along Coles Creek about 30 feet upstream from the battery pile. Another area with gray fibrous material on the soil surface near the sandstone mortared wall was found to contain up to 50% chrysotile. Chrysotile is the most common form of asbestos.

In addition to the contamination described above that appears to be associated with the on-site smelting operations, a battery pile was found adjacent to Coles Creek that is approximately 800 square feet in size. Lead was detected at a concentration of 157,000 ppm in a surficial soil sample collected from this area, and TCLP lead was 950 ppm. This pile is believed to have been generated by the junkyard business that operated on site after the smelting operations ceased.

Water and sediment samples were collected from the site during the site investigation. These included surface water samples from Coles Creek and Portage Lake, ground water from on-site residential drinking water wells and ground water from shallow monitoring wells. Sediment samples were collected from Coles Creek. There were no detections of chemicals of concern from any surface water sample. Only one of the residential drinking water wells had a detection of a chemical of concern. Lead was found in the on-site residential well at 7.5 micrograms per liter (µg/l) which is below the treatment technique action level of 15 µg/l. There is no maximum contaminant level (MCL) for lead in drinking water. Ground water monitoring wells were screened at 5 feet below the ground surface. These wells were screened in the shallow ground water, which is not used as a drinking water source. None of the ground water monitoring wells had concentrations of contaminants of concern above the Michigan Groundwater Contact Protection Criteria. Metals were detected in stream sediment but at levels that did not exceed Michigan’s residential direct contact criteria.

A time critical removal action was initiated at the site in September 10, 2013.

2. Current Activities

2.1 Operations Section

Narrative:

Week's Activities Overview

Over the week beginning the September 9th, 2013 work focused primarily on the following activities:

- Project planning, setup, orientation and coordination
- Drafting and revising site health and safety plan
- Drafting and revising site air monitoring plan
- Drafting and finalizing the site security plan
- Drafting, finalizing and distributing the site emergency contingency plan
- Clearing the land surrounding the battery pile, rear asbestos pile, mercury knob and 1.5 acre where cover will be installed.
- Improving access paths to hillside waste piles

Soil Monitoring:
Throughout the site, after excavation of predesignated waste piles, remaining soil will be screened with the XRF to determine the amount of lead, copper, and arsenic remaining in the soil, if any. If levels of metals in remaining soil exceeds the residential direct contact criteria (RDCC), soil will be demarkated before backfilling.

Air Monitoring and Sampling:
Every day that cover installation and excavation and loading of contaminated soils will be ongoing air monitoring will be conducted to ensure public and worker safety. This work (and therefore air monitoring and sampling) is anticipated to begin on 9/16/13.

Chemical hazards due to fugitive emissions from removal activities are anticipated to be low since the ERRS contractor will employ administrative and engineering controls (i.e.; barricades, warning signs, and suppression measures) to minimize fugitive emissions and particulates (dust) that migrate off-site.

Meteorological data will be obtained daily from the NWS website that provides current weather conditions at the Houghton County Airport (Airport Code: KCMX) and documented in the site logbook.

Perimeter Air Monitoring:
Datarams will be deployed along three of the perimeter boundaries where off-site receptors are most at risk to exposure from fugitive emissions. The smelter facilities were built into the northwest facing hillside, therefore monitors will be established along the north, east, and west site boundaries. Real-time particulate data will be transmitted back to the site command post where it will be monitored continuously.

The perimeter action level for particulate has been set at 500 micrograms per cubic meter (µg/m3). Should a DR4 unit detect sustained particulate concentrations greater than 500 µg/m3, administrative and/or engineering controls will be initiated to reduce the particulate emissions.

Exclusion Zone Air Monitoring and Sampling:
Personal DR (PDR) particulate air monitors will be deployed in the exclusion zone during active excavation and capping activities. The particulate monitors will data-log instantaneous and time weighted average (TWA) particulate concentrations during active excavation/loading operations. The data logging averaging period will be set to log at 60-second intervals. Data logs will be downloaded and stored on a daily basis.

The concentrations of contaminants identified in the removal assessment analytical results were used to establish a site-specific action level of 95 µg/m3 for total particulates for the exclusion zone. The crew will implement appropriate engineering control measures if an exceedance of the established action level is sustained for more than 60 seconds. Action level exceedances will be managed by setting the monitor to alarm at the established action level to notify on-site personnel.

Integrated air sampling for personnel exposure characterization will be performed by ERRS for inorganic contaminants and asbestos in the breathing zone. ERRS will collect samples from personnel with the greatest potential for exposure within the exclusion zone for each job classification, and will be monitored for a full shift (minimum of seven hours) over the first three days of intrusive activities. If the exposure assessment reveals employee exposures to be below the action level, further exposure determination will be discontinued. If there is a change of equipment, process, control, or a new task has been initiated that may potentially result in an employee being exposed at or above the action level, additional air monitoring shall be conducted. Should the sample results indicate exposures over the OSHA permissible exposure limits and site-specific action levels, engineering controls will be adjusted and an additional three days of air sampling will be conducted.

Specific activities completed each day are described in further detail below.

Activities on 9/9/13:
- Mobilization to Houghton
- Heavy equipment, including a bull dozer, an excavator, and a front end loader were delivered to the Site. A water truck to be used for dust control, an electrical generator, and an equipment trailer were delivered to support Site activities.

Activities on 9/10/13:
- The crew attended a site kickoff meeting, initial health and safety briefing and completed a site walk
- Finalized and distributed emergency contingency plan to County Sheriff, County Emergency Management Department, and left copy for local fire department
- Revised the site health and safety plan
- Coordinated with landowners and other local stakeholders regarding project activities and schedule
- Began clearing the land surrounding the battery pile, and the rear asbestos pile.

Activities on 9/11/13
- Continued coordination with landowners and other local stakeholders regarding project activities and schedule.

- Continued clearing the land surrounding the battery pile, and the rear asbestos pile.
- Initiated clearing and grubbing activities in the footprint of the contaminated surface soil scheduled for cap placement.
- Installed silt fence along the foot of the Battery Debris Area to prevent soil erosion/sedimentation impacts to Cole's Creek during removal activities.
- Revised site air monitoring plan.
- Used GPS to mark perimeter of 1.5 acre area to be covered, and located and flagged 6 "hot spot" areas of surface soil contamination ie the "hillside waste piles".

Activities on 9/12/13
- Continued clearing and grubbing the land surrounding the battery pile, and the rear asbestos pile, and the area to be capped.
- Established an access ramp to Terrace 3 to provide access to the hillside waste piles scheduled for removal.
- Installed silt fence along the north/northwest limits of the proposed cap area.
- Reviewed areas scheduled for clearing to access Mercury Knob, which is scheduled for removal.
- Coordinated with the site property owners, reviewing completed removal activities to date and upcoming work.

Activities on 9/13/13
- Continued clearing and grubbing the land surrounding the battery pile, and the rear asbestos pile, and the area to be capped.
- Initiated clearing and grubbing activities of the land surrounding the mercury knob waste pile.
- Continued to develop/improve access to the hillside waste piles. Established an access ramp to Terrace 3 to provide access to the hillside waste piles scheduled for removal.
- Continued to coordinate with the site property owners, reviewing completed removal activities to date and upcoming work.
- Implemented dust control
- Mobilized and set up office trailer

2.1.3 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)
A general notice letter was issued to the Copper Range Company on November 5, 2012. A response was received from indicating that they were unsure about their liability and do not have the financial resources to conduct the removal action at the site. Investigation is ongoing.

2.1.4 Progress Metrics

Waste Stream	*Medium*	*Quantity*	*Manifest #*	*Treatment*	*Disposal*

2.2 Planning Section

2.2.1 Anticipated Activities

The following activities have been planned for this removal action:

1. Developing and implementing a site-specific Health and Safety Plan, including an Air Monitoring Plan, and a site Emergency Contingency Plan;
2. Developing and implementing a site Work Plan that includes a Site Security Plan;
3. Removing the mercury knob waste pile, 2 hillside waste piles, and the battery debris pile;
4. Posting boundaries of terraces that contain contamination, and which cannot safely and practically be accessed for cleanup, with signage regarding the presence of contamination;
5. Delineating subsurface contamination and installing an approximately 6-inch thick cover over metal-contaminated soil within an approximately 1.5-acre area;
6. Removing piles of asbestos-containing materials for off-site disposal;
7. Consolidating and packaging all materials containing hazardous substances, pollutants and contaminants for transportation and off-site disposal;
8. Backfilling and restoring excavated and disturbed areas;
9. Transporting and disposing of all characterized or identified hazardous substances, pollutants, wastes, or contaminants that pose a substantial threat of release at a Resource Conservation and Recovery Act/CERCLA-approved disposal facility in accordance with EPA's Off-site Rule (40 C.F.R. § 300.440); and
10. Addressing releases from other contaminated media in accordance with applicable, appropriate, and relevant requirements to the extent practicable.

The response action proposed will mitigate the threats at the site by properly identifying, consolidating, and packaging hazardous materials, pollutants, and contaminants on-site. The consolidated materials will be removed and ultimately disposed of off-site. Additional site activities may include security, perimeter air monitoring, and decontamination on the site, as needed to complete the removal action. This response action will be conducted in accordance with Section 104(a)(1) of CERCLA, 42 U.S.C. § 9604(a)(1) and Section 300.415 of the NCP, 40 C.F.R. § 300.415, to abate or eliminate the immediate threat posed to public health and/or the environment by the presence of the hazardous substances. Direct contact threats with hazardous substances are expected to be minimized at the site once the removal action is completed.

2.2.1.1 Planned Response Activities

2.2.1.2 Next Steps

Next week, primary tasks planned are excavation of the battery pile, and other waste piles, time permitting. A detailed asbestos survey will also be conducted.

2.2.2 Issues
None.

2.3 Logistics Section
ERRS is managing site logistics.

2.4 Finance Section
No information available at this time.

2.5 Other Command Staff

2.5.1 Safety Officer
OSC is serving in this roll.

2.5.2 Liaison Officer
OSC is serving in this roll.

2.5.3 Information Officer
OSC is serving in this roll.

3. Participating Entities

3.1 Unified Command
n/a

3.2 Cooperating Agencies
MDEQ

4. Personnel On Site

9/10/13:
EPA: 1
START: 1
ERRS: 6
MDEQ: 1

9/11/13:
EPA: 1
START: 1
ERRS: 6
MDEQ: 0

9/12/13:
EPA: 1
START: 1
ERRS: 6
MDEQ: 5

9/13/13:
EPA: 1
START: 1
ERRS: 6
MDEQ: 0

5. Definition of Terms

ATSDR	Agency for Toxic Substances and Disease Registry
BZ	Breathing Zone
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
DNR	Department of Natural Resources
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
ERRS	Emergency and Rapid Response Service
MDEQ	Michigan Department of Environmental Quality
NG/M^3	nanograms per cubic meter
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NRC	National Response Center
OSC	On Scene Coordinator

PPE	Personal Protective Equipment
PPM	Parts per million
RCRIS	Resource Conservation and Recovery Act Information System
RP	Responsible Party
RRT	Regional Response Team
START	Superfund Technical Assessment and Response Team
US FWS	United States Fish and Wildlife Service
USCG	United States Coast Guard

6. Additional sources of information

6.1 Internet location of additional information/report

epaosc.org/michigansmelter

6.2 Reporting Schedule

POLREPS will be issued weekly during the removal action.

7. Situational Reference Materials

n/a