U.S. ENVIRONMENTAL PROTECTION AGENCY
POLLUTION/SITUATION REPORT
Red Arrow Mill - Removal Polrep
Final Removal Polrep

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region VIII

Subject: **POLREP #2**
Final POLREP for the Time Critical Removal Aciton at the Red Arrow Mill Site
Red Arrow Mill
A8B2
Mancos, CO
Latitude: 37.3450987 Longitude: -108.3052290

To: John Irizarry, EPA Headquarters
Eugene Lee, EPA Headquarters
David Ostrander, EPA Region 8
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From: Craig Myers, OSC
Date: 8/8/2014
Reporting Period:

1. Introduction

1.1 Background

Site Number:	A8B2	**Contract Number:**	
D.O. Number:		**Action Memo Date:**	3/31/2014
Response Authority:	CERCLA	**Response Type:**	Time-Critical
Response Lead:	EPA	**Incident Category:**	Removal Action
NPL Status:		**Operable Unit:**	
Mobilization Date:	6/9/2014	**Start Date:**	6/10/2014
Demob Date:	7/29/2014	**Completion Date:**	7/29/2014
CERCLIS ID:	CON000803094	**RCRIS ID:**	
ERNS No.:		**State Notification:**	Colorado DRMS referral
FPN#:		**Reimbursable Account #:**	

1.1.1 Incident Category

Time-Critical Removal Action

1.1.2 Site Description

The CERCLIS ID for the site is CON000803094. This time-critical removal action involves the cleanup, treatment and disposal of mercury-contaminated soil, the disposal of hazardous substances in above ground containers, and the cleanup of a building contaminated with mercury.

1.1.2.1 Location

1000 West Grand Ave, Mancos, CO, 81328.

The facility is located on the edge of the Town of Mancos, Colorado, but is legally in unincorporated Mesa County.

1.1.2.2 Description of Threat

Threats include off-site migration of arsenic and mercury laced mill tailings and the threat of release posed by abandoned bulk containers.

1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results

The preliminary removal assessment and removal site inspection for this action was performed by Walter Environmental under contract with the Colorado Department of Reclamation, Mining and Safety (DRMS). Detailed results of this activity are available in the administrative record for the site in the report entitled, "Evaluation Summary Report Red Arrow Mine, Mancos, CO" dated August 1, 2013 – hereafter referred to as the Walters Report.

The Walters Report identified numerous small piles of apparent mill tailings with varying levels of arsenic,

one pile contaminated with mercury, and an amalgamation building with ubiquitous mercury contamination inside. It also identified two arsenic laced waste piles that had been moved off of the facility onto neighboring land unassociated with the milling operation. In addition, the Walters Report identified a mercury laden tailings pile on the permitted mine site.

The Federal On-Scene Coordinator (OSC) performed the initial site visit on September 12, 2013. At the time of the OSC's first site visit in September, airborne mercury levels in the building exceeded the instrument's measurement capability of 50,000 nanograms/cubic meter (ng/m^3) – more than twice the level where respiratory protection would be required of anyone entering the building and 17 times the Agency for Toxic Substances and Disease Registry (ATSDR) recommended level for unrestricted industrial use of 3,000 – 4,000 ng/m^3, or 3–4 micrograms per cubic meter ($\mu g/m^3$), according to the *ATSDR Chemical Specific Health Consultation – Mercury, 2012* (ATSDR Consultation).

In late September 2013, DRMS conducted an emergency stabilization action utilizing state emergency funds available to DRMS to consolidate all known tailings on the mill site under a weatherproof cover for the winter – the sole exception is the aforementioned pile on the permitted mine site. Unknown liquids identified in the Walters Report were bulked into new containers as well. Further details of this action are presented in section B(1) of this memorandum and are documented in an Initial/Final Pollution Report (POLREP) in the site file. The OSC mobilized the Superfund Technical Assessment and Response Team (START) to conduct sampling of the waste material outside of the mill buildings only during this event.

On December 10, 2013, the OSC re-mobilized START to conduct additional sampling and air monitoring to further delineate the nature and extent of contamination both inside and outside the mill building. Details and results of both START efforts are available in the START Removal Evaluation report in the site file but are also summarized below.

The site evaluation confirmed high levels of mercury within the mercury process building. As the report points out, the levels measured in December were likely lower than average due to the extreme cold, but were still extremely elevated at 3–4 times the previously noted ATSDR recommended values for unrestricted use of an industrial structure. The START report also identified several items and process wastes within the building that are heavily contaminated with arsenic and/or mercury.

Additional assessment of the mill tailings and other waste on the mill site was performed as part of this effort as well. Nearly across the board, the waste on site contains leachable forms of arsenic, with a subset of the waste additionally containing leachable forms of mercury, as evidenced by mercury and arsenic detections in the Toxicity Characteristic Leaching Procedure (TCLP) and Synthetic Precipitation Leaching Procedure (SPLP) tests (START Removal Evaluation Report, Tables 1 and 2). In short, these test results show that the material will cause an ongoing release to the environment if not properly managed at an appropriate facility. As noted in action memorandum for the site, a large amount of waste/tailings have been placed into a temporary impoundment on site designed to be protective over the winter while a more permanent solution could be developed and other legal issues surrounding the permitted mine and unpermitted mill could run their course.

2. Current Activities

2.1 Operations Section

2.1.1 Narrative

2.1.2 Response Actions to Date

ERRS crews spent the time from June 10th through June 17th cleaning the larger equipment with mercury vaccuum units and HgX decon solution. Once free of visible mercury, all equipment was bagged and removed to be screened with a Lumex according to the 2013 EPA/ATSDR guidance. Anything with a reading greater than 50,000 ng/m3 was disposed, with the exception of the amalgamation unit and an ore concentrator, which had been identified by the mining company as high dollar assets (>$35,000 in value). Extra effort was made to clean items to get them below 50,000 ng/m3 if the items appeared to be made of non-pourous materials. Initial morning mercury concentrations in the building exceeded 100,000 ng/m3 daily during this time.

Simultaneously, as crews cleaned and removed equipment, they also vaccuumed the floor in areas where free mercury was located. In total, crews have recovered approximately 240 lbs of liquid mercury waste in various containers and via vaccuuming.

After the bulk of the equipment was removed, crews began scraping the floor and cleaning all tailings dust that had become impacted on the floor and in crevices, as this dust appeared to be a significant source of airborne mercury.

The concentration at the start of work on June 17th was approximately 18,000 ng/m3. That day, crews started mopping the floors with HgX solution, and began a more thorough cleaning effort of the floor and walls. Crews sealed the floor with a garage floor epoxy sealer, and painted the walls and wooden loft structure with multiple coats of a latex based primer. This brought the levels down, but did not achieve the stated goal in the ATSDR guidance of 3-4,000 ng/m3.

Crews resealed the floor, making extra effort to positively seal all edges and cracks, ultimately removed all wood and metal - including the heater - that was not part of the structure of the building, and then painted every remaining wall and ceiling surface with 2 coats of latex primer to seal vapors into the materials. As of the morning of June 23rd, the building remained around 7,000 ng/m3, or twice the cleanup goal.

Using the Lumex, crews located small deposits of fine material in the large bay doors and under the man-door threshold. These areas were meticulously cleaned with HgX soap while removing the fine particles, but it did not bring the levels down when the building was heated for two hours on the afternoon of the 23rd.

Crews also treated process water that had been previously pumped from process tanks to temporary tanks by the property owner under direction from the OSC. This water was then stored in onsite tanks pending analyitcal results.

The OSC made the decision to utilize the hot weather forecast over the next month to heat and vent the building until crews returned to the site to dispose of the packaged hazardous and mill wastes. To that end, the OSC had crews install a fan in the former furnace exhaust to vent the building at a low flow rate to continuously remove mercury vapors as they are released from the building materials in an attempt to reach the targeted cleanup goal.

The OSC and ERRS crews remobilized on July 21st, 2014. Upon arrival, the OSC rescreaned the building for mercury vapors. Initial readings were approximately 900 ng/m3 at an internal building temperature around 50 degrees Farenheight. Later that afternoon after heating in the 90+ degree outside temperatures, the building screened slightly above 4,000 ng/m3 at approximately 65 degrees. The OSC directed the ERRS crews to begin heating and venting the building while other removal actions were taking place on site in order to try and meet the ATSDR/EPA clearance goals of 3-4,000 ng/m3.

Waste soils began shipping on July 23rd with transportation activities completing on July 25th. The previously mentioned treated process water was sprayed onto the pile for dust supression during loading, as analytical results showed that it had been successfully treated to below land disposal restriction requirements and could be land applied.

Backfilling and regrading the site begain on July 26th, and completed on July 28th.

Hazardous wastes and other containerized wastes shipped for disposal as noted below on July 29th, completing the removal action.

2.1.3 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)

Enforcement options are still being considered by EPA.

2.1.4 Progress Metrics

Waste Stream	***Medium***	***Quantity***	***Manifest #***	***Treatment***	***Disposal***
Non-regulated Mercury Debris	30 YD Roll Off	3	Non-Haz		San Juan County Landfill, Aztec, NM
Contaminated Soils	Soil	1502 cubic yards	Non-Haz		Montezuma County Landfill, Cortez, CO
D009 Water Treatment Media	Spent Water Treatment Media		012542932JJK		Evoqua Water Technologies
Flammable Aerosols	Drum	1	007709279FLE		RINECO, Benton, AR
D001 Flammable Liquids	Drum	1	007709279FLE		RINECO, Benton, AR
Waste Oil (D018)	Drum	1	007709279FLE		RINECO, Benton, AR
D009 Contaminated Soil	Yd3 Box	6	007709281FLE		Clean Harbors, Deer Trail, CO
D009 Contaminated Soil	Drum	2	007709281FLE		Clean Harbors, Deer Trail, CO
Waste Sodium Hydroxide	Drum	1	007709280FLE		Clean Harbors, Deer Trail, CO
Waste Nitric Acid	Drum	1	007709280FLE		Clean Harbors, Deer Trail, CO
Waste HCL Acid	Drum	1	007709280FLE		Clean Harbors, Deer Trail, CO
D009 Waste Mercury	Drum	2	007709282FLE		Clean Harbors, Kimbal, NE*
Lead Acid Batteries	Drum	1	007709282FLE		Clean Harbors, Kimbal, NE
Non-Haz Bulked Oil	Drum	1	Non-Haz		RINECO, Benton, AR

Non-Haz Commodity Oil	Drum	1	Non-Haz		RINECO, Benton, AR

*ulitmate final disposal will be at Mercury Waste Solutions Union Grove Wisconsin, where it will be stored until the Department of Energy opens the facility required under the Mercury Export Ban Act of 2008. The EPA will not be incurring storage fees.

2.2 Planning Section

2.2.1 Anticipated Activities

2.2.1.1 Planned Response Activities
None.

2.2.2 Issues
None.

2.3 Logistics Section

Not applicable to this action.

2.4 Finance Section

Estimated Costs *

	Budgeted	Total To Date	Remaining	% Remaining
Extramural Costs				
ERRS - Cleanup Contractor	$288,000.00	$185,000.00	$103,000.00	35.76%
TAT/START	$35,000.00	$30,688.00	$4,312.00	12.32%
USCG Strike Team	$15,000.00	$15,000.00	$0.00	0.00%
Intramural Costs				
Total Site Costs	$338,000.00	$230,688.00	$107,312.00	31.75%

* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

2.5 Other Command Staff

2.5.1 Safety Officer
Not applicable to this action.

2.5.2 Liaison Officer
Not applicable to this action.

2.5.3 Information Officer
Not applicable to this action.

3. Participating Entities

3.1 Unified Command
Not applicable to this action.

3.2 Cooperating Agencies
Colorado Department of Reclamation and Mining Safety
U.S. Environmental Protection Agency

4. Personnel On Site

All personnel have demoblized at this time.

5. Definition of Terms

No information available at this time.

6. Additional sources of information

6.1 Internet location of additional information/report
www.epaosc.org/redarrowmill

6.2 Reporting Schedule

This is the final POLREP for this action.

7. Situational Reference Materials

Additional information is available at www.epaosc.org/redarrowmill.