

FIVE-YEAR REVIEW REPORT

**Second Five-Year Review Report
for
Cleveland Mill Superfund Site
Grant County, New Mexico**

August 2007



PREPARED BY:

**United States Environmental Protection Agency
Region 6
Dallas, Texas**

FIVE-YEAR REVIEW REPORT

Cleveland Mill Superfund Site
EPA ID #NMD981155930
Grant County, New Mexico

Summary of Five-Year Review Findings

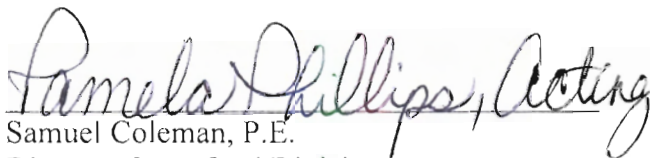
This is the second five-year review of the Cleveland Mill Superfund Site (the "Site") located in Grant County, New Mexico. The results of the five-year review indicate that the remedy is protective of human health and the environment. Based on this five-year review, Site documentation confirms the remedy at the Site as set forth in the Record of Decision (ROD), the Amended ROD, and the Action Memorandum has been implemented and is protective of human health and the environment.

Actions Needed

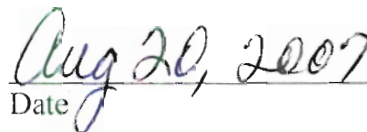
The remedy is functioning as designed, and the Site has been maintained appropriately. No deficiencies were noted that impact the protectiveness of the remedy, and the remedy should remain protective if the Site Operation and Maintenance is continued. Ground water monitoring shall also continue as detailed in the Statement of Work for the Site Consent Decree.

Determinations

I have determined that the remedy for the Cleveland Mill Superfund Site is protective of human health and the environment.


Samuel Coleman, P.E.

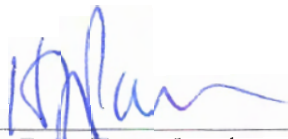
Director, Superfund Division
U.S. Environmental Protection Agency
Region 6


Date


SECOND FIVE-YEAR REVIEW REPORT
for
Cleveland Mill Superfund Site
Grant County, New Mexico
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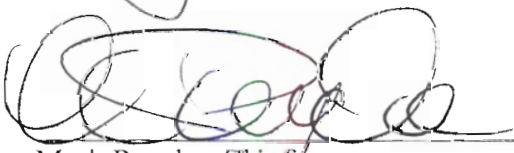
CONCURRENCE LIST

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SECOND FIVE-YEAR REVIEW REPORT
for
Cleveland Mill Superfund Site
Grant County, New Mexico
EPA ID# NMD981155930

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
FIVE YEAR REVIEW SUMMARY FORM	ii
LIST OF ACRONYMS	iv
I. Introduction.....	1
II. Site Chronology.....	2
III. Background	3
IV. Remedial Actions	4
V. Progress Since the Last Review	6
VI. Five-Year Review Process	6
Administrative Components and Community Involvement.....	6
Document Review.....	7
Data Review.....	7
Ground Water Monitoring.....	7
Surface Water Monitoring.....	8
Interviews.....	9
VII. Technical Assessment	10
VIII. Issues	11
IX. Recommendations and Follow-up Actions	12
X. Protectiveness Statement.....	12
XI. Next Review	12

EXECUTIVE SUMMARY

The second five-year review of the Cleveland Mill Superfund Site (the “Site”) located near Silver City, New Mexico, was completed from January 2007 to July 2007. The results of the five-year review indicate that the remedy is protective of human health and the environment. Overall, the remedial actions performed are functioning as designed, and the Site has been maintained appropriately. No deficiencies were noted that impact the protectiveness of the remedy.

The response action at the Site consisted of several steps. First the tailings and sediment with concentrations above the remediation goals were excavated and disposed of in an on-site disposal cell located away from significant natural drainage areas. The disposal cell was covered with a cap designed and constructed in a manner to maximize drainage around the disposal cell, minimize erosion, and permanently minimize the migration of liquids through the underlying tailings, sediment, and soil. The cap of the disposal cell is a multi-layered cap which includes one impermeable (less than 10^{-8} cm/sec permeability) synthetic layer. The bottom of the disposal cell was located at least 25 feet above the seasonal high ground water table. The Site was re-vegetated with native vegetation to assist in erosion control. Excavated areas were tested to verify that the remedial action goals had been met. The field activities were completed in November 1998. The Site was deleted from the National Priorities List (NPL) on July 23, 2001.

Operations and Maintenance (O&M) at the Site consist of inspections to confirm fence integrity, inspection of sediment containment structures, and inspections of the disposal cell. Site inspections show that the site remedy has been effective and minimal maintenance has been necessary. Annual ground water monitoring has been conducted and no contaminants of concern as defined in the Record of Decision (ROD) have been detected above the maximum contaminant levels (MCLs) in the ground water. The concentration of constituents in wells monitoring the integrity of the disposal cell have been consistent or lower since the removal action was completed.

Based on the five-year review, site documentation confirms the remedial action goals at the Site as set forth in the Amended ROD have been achieved and the remedy continues to be protective of human health and the environment.

FIVE YEAR REVIEW SUMMARY FORM

Site Identification

Site Name (from CERLIS): Cleveland Mill Site
EPA ID Number (from CERCLIS): NMD981155930
EPA Region: 6
State: New Mexico
City/County: Grant County

Site Status

NPL Status: Final Deleted Other (specify):
Remediation Status: Under Construction Operating Complete
Multiple OUs: Yes No
Construction Completion Date: September 23, 1999
Has the site been put into reuse? Yes No

Review Status

Reviewing Agency: EPA NMED Tribe Other (specify):
Author: Bret Kendrick, U.S. EPA Region 6
Review Period: January – July 2007
Date(s) of Site Inspection: February 22, 2007; Re-inspected July 25, 2007
Type of Review: Statutory Policy
 Post-SARA Pre-SARA NPL Removal only
 Non-NPL Remedial Action Site NPL State/Tribal Lead
 Regional Discretion
Review Number: 1 (first) 2 (second) 3 (third) Other (specify):
Triggering Action: Actual RA On-site Construction Actual RA Start at OU# _____
 Construction Completion Previous Five-year Review Report
 Other (specify):

Triggering Action Date (from CERCLIS): August 20, 2002
Due Date (five years after triggering action date): August 20 2007

Issues:

Two issues were identified during the five-year review inspection. First, inspection participants noted that one section of the fencing around the disposal cell was damaged. Specifically, one strand of barbed wire used in the construction of this section of fencing was broken. Second, inspection participants noted that the outer protective casing on monitoring well 97MW-6 was damaged. Specifically, the lock hasp was broken off the protective cover. These minor issues were addressed during the five-year review period.

Recommendation and Follow-up Actions:

Because the two issues, a damaged section of the fencing surrounding the disposal cell and a damaged protective outer casing on monitoring well 97MW-6 have been resolved, there are no recommendations or follow-up actions.

Protectiveness Statement(s):

The remedy completed for the Site is protective of human health and the environment.

Other Comments:

No other comments.

LIST OF ACRONYMS

AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
Bayard	Bayard Mining Corporation
CBS	CBS Operations, Inc.
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
MCLs	Maximum Contaminant Levels
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
msl	mean sea level
MRRC	Mining Remedial Recovery Company
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NPL	National Priorities List
O&M	Operations and Maintenance
OU	Operable Unit
RA	Remedial Action
RAOs	Remedial Action Objectives
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SOW	Statement of Work

I. Introduction

The purpose of this five-year review is to determine whether the remedy at the Cleveland Mill Superfund Site (the “Site”) is protective of human health and the environment. The methods, findings, and conclusions of the five-year review are documented in this five-year review report. In addition, this report identifies issues found during the review, and states how these issues were addressed.

The United States Environmental Protection Agency (EPA or Agency) is preparing this five-year review pursuant to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section (§) 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121 states: *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action.*

The Agency interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states: *If a remedial action is selected that results in hazardous substances, pollutants or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The EPA Region 6 has conducted a five-year review of the remedial action implemented at the Site in Grant County, New Mexico. The New Mexico Environment Department (NMED) participated in the review as the support agency. The review, which began with a Site inspection in February 22, 2007, was conducted from January 2007 to July 2007. Participants in the inspection included a representative from NMED, representatives from CBS Operations, Inc. (CBS), Bayard Mining Corporation (Bayard), Mining Remedial Recovery Company (MRRC) representing the Potentially Responsible Parties (the “participating companies”), and the participating companies’ consultant, AdrianBrown Consultants, Inc. This report documents the results of the five-year review.

This is the second five-year review for the Cleveland Mill Superfund Site. The triggering action for this review is the date of the completion of the first five-year review report as shown in EPA’s CERCLIS database. The response action at the Site, initiated in 1997, included the placement of treated tailings and sediment in an on-site disposal cell. Because hazardous substances remain on-site at levels that do not allow for unlimited use of the disposal cell area of the Site, a five-year review is necessary.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Initial discovery of problem or contamination	1985
Pre-National Priorities List responses	None
NPL Listing	03/31/89
Removal Actions	09/08/97 – 12/10/98 ¹
Remedial Investigation/Feasibility Studies	03/29/90 – 09/22/93
ROD Signature	09/22/93
ROD Amendments	09/20/99
Enforcement Documents	03/13/95 (Consent Decree) 09/18/97 (Administrative Order on Consent)
Remedial Design (RD) Start	01/19/95 ²
Remedial Design Complete	11/06/97 ³
Actual Remedial Action (RA) Start	See Removal Action Dates
Construction Dates (start finish)	See Removal Action Dates
Construction Complete Date	09/23/99
Final Close-out Report	06/16/00
Deletion from NPL	07/23/01
Previous Five-Year Review	08/20/02

¹ Date of Removal Action Final Report from the participating companies.

² This is the date the RD to implement the 1993 ROD was initiated.

³ This is the date the participating companies' removal work plan was approved. There was no RA work plan.

III. Background

The Cleveland Mill Superfund Site is located in southwestern New Mexico, approximately 5.5 miles north of Silver City in Grant County, New Mexico. The coordinates of the Site are the northeast quarter of Section 2, Township 17 South, Range 14 West. The Site, which contained an operating mine and mill in the early part of the century, is located at the headwaters of a small tributary of Little Walnut Creek, an intermittent creek. The Site occupies approximately 4 acres in mountainous terrain at an elevation of approximately 7,200 feet above mean sea level (msl), and it also occupies approximately 14 acres which extend down the drainage area (the intermittent creek) and into the streambed of Little Walnut Creek.

The Site is located in a developing residential area that is adjacent to the Gila National Forest and private lands. Downstream residences are concentrated along Little Walnut Creek, almost all of which rely on private wells for potable water and agricultural uses. The nearest residence is located approximately 1,000 feet west of the Site. The population within a 3-mile radius of the site is estimated to be 1,200⁴. The present and future land uses for the Site and the surrounding land are residential, recreational, and agricultural with limited grazing of cattle.

Disposal of mill tailings and mine waste rock occurred in several areas of the Site during mining activities and during processing related to the Cleveland Mine. These areas contained tailings and sediment⁵ contaminated with metals such as arsenic, beryllium, cadmium, lead, and zinc from ore processing. The March 1993 Remedial Investigation (RI) report stated that a shallow on-site aquifer at the toe of the tailings was also contaminated with beryllium and cadmium, and residential wells located downstream from the Site in a deeper aquifer showed effects from the Site. The residential wells showed elevated concentration of sulfates which were also found in the tailings, but the wells did not have any Site-related contaminants at concentrations exceeding health-based standards.

Citizen complaints to the NMED, formerly the New Mexico Environmental Improvement Division, are what initially led to NMED's 1985 identification of the Site as an area of potential concern. Residents along Little Walnut Creek and the Site drainage area that served as a tributary of the creek complained about the acidic runoff of the tailings into the creek, causing the water color to change to a dark red. The Site was proposed to the National Priorities List (NPL) on June 24, 1988, and added to the final NPL on March 31, 1989. Risk from direct contact with Site contaminants in the soil media (tailings and sediment) and in the surface water, and the potential risk to residents' drinking water wells were determined to be primary health threats.

There were no response actions taken at the Site until implementation of the Action Memorandum. This is explained in the following section.

⁴ Population estimated based on Census data from 2000.

⁵ Note that the term "tailings and sediment" was used to ensure that the participating companies cleaned all the contamination in the soil media, most of which were tailings that had fallen into the Site drainage. Because this drainage, a small tributary to Little Walnut Creek, is almost always dry, this material is not technically "sediment" as the term is used in most EPA documents.

IV. Remedial Actions

The EPA, in consultation with NMED, signed a Record of Decision (ROD) for the Site on September 22, 1993, to address all contaminated areas of the Site in one operable unit (OU). The overall Site remedy, as described in the 1993 ROD, would have addressed the current and potential threats to human health and the environment at the Site through excavation of the waste material, transportation of the waste material to a reprocessor for treatment, and disposal of the residuals at the reprocessing facility in an area where other tailings and residuals from ore-processing were disposed. The remedy in the 1993 ROD did not include a remedy for the shallow on-site aquifer because the EPA believed that the contamination would attenuate once the source was removed. Therefore, the 1993 ROD included ground water monitoring to ensure that the contamination did not worsen or spread to nearby residential wells prior to the source removal.

In a 1995 Consent Decree (CD), the participating companies (Mining Remedial Recovery Company, Bayard Mining Corporation, and Viacom International Inc.) agreed to implement the remedy specified in the 1993 ROD. However, the participating companies were not able to implement the remedy specified in the 1993 ROD because a search for an acceptable off-site disposal facility was unsuccessful. In addition, unanticipated weather events caused extensive contaminant migration at the Site. This contaminant migration increased the potential risk to human health and the environment and made the risk more immediate.

To address the immediate risks, on July 11, 1997, the EPA, with the concurrence of the NMED, issued an Action Memorandum that authorized a time-critical removal action to physically address the Site contamination and restore affected surface areas at the Site. The participating companies agreed to implement this action through an Administrative Order on Consent (AOC) with EPA which became effective on September 23, 1997. The Removal Action Work Plan, submitted by the participating companies, was approved by EPA on November 6, 1997. The Removal Action Work Plan detailed the design criteria and the steps that would be undertaken to achieve the goals and objectives of the 1993 ROD.

The time-critical removal action included:

- Excavation of 164,960 cubic yards of contaminated tailings and sediment from the mine area, the mill area, and the streambed;
- Neutralization of the acidic excavated material through admixing with limestone;
- Disposal of the neutralized material in a limestone cell constructed at the Site;
- Covering of the cell with a multi-layered cap;
- Construction of erosion control measures such as terraces; and
- Re-seeding of the disturbed areas of the Site and the disposal cell cap.

Health-based remediation goals for the soil media specified in the 1993 ROD (these goals were referred to as remedial action goals in the 1993 ROD) and incorporated into the 1997 Action Memorandum included:

- Arsenic 30 milligrams per kilogram (mg/kg);
- Beryllium 4 mg/kg;
- Cadmium 140 mg/kg;
- Lead 500 mg/kg; and
- Zinc 82,000 mg/kg.

At the conclusion of the time-critical removal action, confirmatory samples were collected in all excavated areas of the Site to verify that all tailings and sediment with concentrations of contaminants higher than the remediation goals had been removed.

The field activities required by the AOC were completed on November 19, 1998, the date on which the last area of the Site was seeded. Completion of the final AOC requirement occurred on December 10, 1998, the date the participating companies submitted the Removal Action Final Report.

The EPA issued an Amended ROD for the Site on September 20, 1999, stating that no further response action was necessary; however, as explained in the Amended ROD, the ground water and surface water monitoring, Operation and Maintenance (O&M) of the constructed remedy, and implementation of the existing institutional controls were required to continue at that time as specified in the 1993 ROD and the 1995 CD (subsequently, in a 2003 letter, EPA advised the participating companies that surface water monitoring was no longer necessary). Institutional controls include restrictive covenants limiting the use of ground water and advising future owners about the risks of disturbing the cover and/or the underlying material. These restrictive covenants are attached to the property deeds and filed in the Grant County office. Access to the Site (located in mountainous terrain) is currently limited through the use of gates and some fencing. Restrictive covenants, limiting land and ground water use in the disposal cell area, were filed in August 1999. Therefore, all institutional controls are in place.

Operation and Maintenance activities began immediately after the completion of the removal action. The participating companies, as agreed upon in the CD and accompanying Statement of Work (SOW) and the AOC, and as detailed in the O&M Plan, have assumed responsibility for all O&M at the Site, with EPA and NMED oversight. O&M activities include routine Site inspections to ensure that the cap on the disposal cell remains intact and that vegetative cover at the Site is sufficient to minimize erosion in the excavated areas. Initially, ground water and surface water monitoring are performed on a schedule stated in the CD SOW and in the O&M Plan. In January 2003, EPA approved a revised O&M Plan. Currently, a routine Site inspection and ground water monitoring are performed annually in July. The

purpose of the ground water monitoring is to ensure that the disposal cell remains intact and does not discharge contaminants to the environment.

The participating companies have paid for EPA past costs and oversight costs, implementation of the cleanup, and O&M activities to date. Under the AOC and the CD, the PRPs will continue to pay O&M and oversight costs. Although the participating companies have not disclosed their O&M costs, EPA believes that the costs are comparable or somewhat lower than the annual O&M costs of \$51,250 estimated in the 1993 ROD.

V. Progress Since the Last Review

During the previous five-year review completed in 2002, the remedy was found to be functioning as designed, and the Site was maintained appropriately. No deficiencies were noted that impacted the protectiveness of the remedy. The remedy was determined to be protective of human health and the environment.

Two issues were identified during the previous five-year review that did not impact the remedy. The first issue was the deteriorated condition of the access road used by some of the surrounding home owners/land owners. Reportedly, the access road had become heavily rutted due to truck traffic during the removal action. To address this issue, the participating companies paid to have the deteriorated portions of the access road repaired. At the same time, the nearby land owners paid to have the remaining portions of the access road re-graded and re-graveled.

The second issue concerned the gate at the entrance to the Site. During the Site inspection during January 2002, there was evidence that the gate integrity was compromised allowing unauthorized vehicles access to the Site. As a result, the gate was immediately repaired, then replaced by a much sturdier gate in March 2002. During the July 2002 inspection, the new gate was intact and there was much less evidence of vehicular traffic on the Site roads.

VI. Five-Year Review Process

Administrative Components and Community Involvement

The EPA, NMED, participating company representatives (CBS, Bayard, and MRRC), and AdrianBrown Consultants, Inc. (participating companies' consultant) participated in the five-year review process. The EPA announced the five-year review process in the local newspaper on January 18, 2007 (see Attachment 1, Public Notice of Five-Year Review). The period of review was from January 2007 through July 2007. As part of the evaluation, the following activities were conducted:

- EPA, NMED, Grant County, Silver City, neighbors, and community members were interviewed;
- Site documents were reviewed;

- Ground water and surface water data were reviewed; and
- The Site was inspected.

All activities and findings are described in the following sections.

Document Review

This five-year review consisted of a review of the relevant documents including Site Progress Reports and associated data dated between 2002 and 2006 (see Attachment 2, Site Data Summary), correspondence between EPA and the participating companies since the previous five-year review, and the previous five-year review report dated August 20, 2002. Applicable Remedial Action Goals and Remedial Action Objectives (RAOs), which were incorporated into the Action Memorandum, were also reviewed.

Data Review

Ground Water Monitoring

Ground water monitoring at the Site has been conducted since the middle of the removal action in 1997. Contaminants were detected at their highest levels early in the history of the Site (during the Remedial Investigation in the early 1990s). The decline in these concentrations is the result of the removal action which removed the source of contamination, the tailings and sediment.

The ROD did not select a remedy for ground water because all the monitoring wells and residential wells used to gather RI data were below Safe Drinking Water Act Maximum Contaminant Levels (MCLs) and New Mexico Water Quality Control Commission (NMWQCC) standards. These wells, and additional wells installed during the removal action to ensure that the disposal cell is not leaking contaminants, have been below these Federal and State standards throughout the O&M period (except for total dissolved solids and sulfate in monitoring well 97MW-4). The residential wells that were used to monitor effects from Site runoff were dropped from the sampling program because they were no longer necessary, and because these wells had contaminants at stable or decreasing concentrations below Federal and State standards. The reasons for changing the sampling program are documented in a March 5, 2001 proposal letter from MRRC, and these changes were subsequently approved by EPA.

One of the RAOs for the Site from the 1993 ROD is to return the shallow perched aquifer at the toe of the tailings to a condition where the concentration of contaminants is below MCLs and NMWQCC standards; however, the shallow aquifer no longer exists. Once the tailings were removed, three attempts to drill wells at the toe of the tailings were unsuccessful in hitting water, and the ground water monitoring well installed in that area has been dry since the monitoring was initiated in 1997. EPA believes that the shallow aquifer at the toe of the tailings was a

perched aquifer that existed because of the tailings and that it was dismantled when the tailings were removed.

The ground water monitoring wells will continue to be sampled on a schedule set forth in the CD, the O&M Plan, and subsequent letter revisions to the O&M Plan. Currently, ground water monitoring wells are sampled annually in July. The Site area has been in severe drought conditions since the ground water monitoring was initiated, so the possibility remains that ground water data may change if there are non-drought years.

Surface Water Monitoring

The 1993 ROD did not select a remedy for surface water because EPA expected that once the source of surface water contamination was removed, all Site-related surface water effects (contamination and diminished water quality) would be resolved. Note that the Site and surrounding area is highly mineralized so that the surface water could still be affected from non-Site-related natural features.

Water quality parameters measured in surface water decreased significantly immediately after the removal action was completed. For example, the surface water sample at the base of the former east tailings pile changed from a total dissolved solids maximum of 53,000 milligrams per liter (mg/L) in September 1997 to 6,800 mg/L in January 2001, for a total reduction of 87 percent. The participating companies have since removed some residuals from sediment retention structures and successfully re-vegetated the Site. Therefore, EPA expects that future effects on the surface water from the Site will be minimal, even in non-drought conditions.

In a letter dated January 3, 2003, EPA responded to a request from the participating companies to modify the O&M Plan. In this letter, EPA agreed to suspend further surface water monitoring requirements; however, the participating companies may be required to reinstate surface water monitoring if conditions at the Site change and there is reason to suspect an impact to the surface water.

Site Inspection

On February 22, 2007, the Site was inspected by Bret Kendrick of EPA, Dana Bahar of NMED, Jeff Groy of CBS, Scott Miller of Arava, Norm Johnson of MRRC, and Adrian Brown of AdrianBrown Consultants, Inc. Areas observed during the site inspection included the disposal cell, the former mill site, the area surrounding the Cleveland Mine entrance, the surface water drainage path for the former mill site including the two uppermost sediment traps, and a confluence between Little Walnut Creek and an unnamed tributary. Photographs taken during the February inspection are included as Attachment 4 of the report.

During the inspection, the cap of the disposal cell was observed to be well vegetated with no evidence of erosion observed. A three-strand, barbed-wire fence surrounds two sides of the disposal cell. No evidence of trespassing on the disposal cell cap was noted during the inspection. In addition, the main gate leading into the Site was secure and locked.

Soils surrounding the former mill site where tailings were removed supported sparse vegetation; however, erosion of the soils was observed to be minimal. The uppermost sediment trap located immediately downgradient from the former mill site was full and supported a variety of vegetation. The second sediment trap further downgradient from the former mill site was also full and also was vegetated. The last two sediment traps downgradient from the former mill site were not observed during the Site inspection, but were reportedly not full and still had capacity to trap sediment.

The area where mine wastes were excavated near the entrance to the Cleveland Mine was observed. This area supported a significant number of evergreen saplings as well as other vegetation. Mr. Miller stated that this area, including the old mine entrance, was sold to a private individual in March 2006.

Finally, a confluence between Little Walnut Creek and an unnamed tributary was observed. The waters originating from the former mill site appeared clear, with no observed discoloration and no discernable odor. The surface water pathway supported a variety of vegetation along the banks of the creek.

A follow-up inspection, conducted in conjunction with the annual sampling, was conducted by EPA on July 25, 2007. Photographs taken during the follow-up inspection are also included in Attachment 4.

Interviews

Interviews of State, County, and local officials as well as neighbors and community members were conducted on February 22-23, 2007 in Silver City, Grant County, New Mexico. The interview responses are included as Attachment 3. Interviews were conducted with the following individuals:

- Rock Vendrey, NMED District Office Manager
- Peter Russell, Community Development Director, Silver City
- James Marshall, Mayor, Silver City
- Dori Dominguez, Subdivision Ordinance Officer, Grant County
- Gilbert Helton, Code Enforcement Officer, Grant County
- Paul and Patricia Unger, nearby landowners
- Lynn Asch, nearby landowner

Interviews with nearby landowners were complementary about the work completed at the Site, especially the remediation of Little Walnut Creek. One concern raised by Mr. Vendrey of the NMED District Office was the continued encroachment of residential development to the

Site. During the inspection, it was noted that the Site is located in a remote area and access to the Site is restricted through the use of a locked gate at the entrance to the Site and that a fence partially surrounds the containment cell. In addition, the participating companies own the land surrounding the containment cell which creates a large buffer zone.

Silver City and Grant County officials knew of no issues related to the Site and had not received any complaints associated with the Site. The Grant County officials interviewed were unaware of the Site's existence and location. In an effort to keep Grant County officials informed of the Site's location and the contaminants associated with the containment cell, a copy of this Five-Year Review Report will be forwarded to the Grant County offices.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, Applicable, or Relevant and Appropriate Requirements (ARARs), risk assumptions, and the results of the Site inspection indicate that the remedy is functioning as intended by the 1993 ROD and the Amended ROD. The neutralization, disposal, and capping of the contaminated tailings and sediments have achieved the remedial objectives of preventing dermal contact, ingestion, and inhalation of contaminated tailings and sediment; and preventing the downstream aquifers from becoming contaminated with hazardous substances from the tailings and sediments, at concentrations which exceed MCLs and NMWQCC standards.

Operation and maintenance of the cap on the disposal cell have been effective. The vegetation on the cap has increased during each inspection, and the cap has remained intact. There were no opportunities for system optimization observed during this review. The monitoring well network provides sufficient data to assess the protectiveness of the disposal cell and the vegetation on the cap is sufficient to maintain its integrity.

The institutional controls that are in place include prohibitions against use of ground water in the area of the disposal cell, prohibitions against excavation activities, prohibitions against disturbing the cap, and prohibitions against any other activities or actions that might interfere with the implemented remedy.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. However, as noted in Section VI of this report, one of the Site RAOs is to return the shallow perched aquifer at the toe of the tailings to a condition where the concentration of the contaminants is below MCLs and NMWQCC standards. EPA believes that the shallow aquifer at the toe of the tailings was a perched aquifer that existed because of the tailings and that it was dismantled when the tailings were removed. Therefore, this RAO is no

longer applicable to the Site due to the physical changes that were made during the removal action.

Changes in Standards and To Be Considereds

Since the remedial work at the Site is complete, the ARARs in the ROD cited for soils and sediment have been met. No newly promulgated standards call into question the protectiveness of the remedy.

Changes in Exposure Pathways, Toxicity, and other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposure and potential future exposures which have not changed because land use has not changed. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. These assumptions are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No change in these assumptions, or the cleanup levels developed from them is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. The remedy is complete and all cleanup standards and RAOs have been met, except as noted in Question B where it is pointed out that one RAO is no longer applicable.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information was discovered during this five-year review period that could affect the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed, the Site inspection, and the interviews, the remedy is functioning as intended by the ROD and the Amended ROD. There have been no changes in the physical conditions at the Site that would affect the protectiveness of the remedy. All ARARs for the tailings and sediment (soil media) contamination have been met. There have been no changes in the toxicity factor or the standard risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

VIII. Issues

Two issues, a damaged section of the fencing surrounding the disposal cell and a damaged protective outer casing on monitoring well 97MW-6 were identified during the five-year review inspection.

1. **Issue:** During the February 2007 five-year review inspection, inspection participants noted that one section of the fencing around the disposal cell was damaged. Specifically, one strand of barbed wire used in the construction of this section of fencing was broken.

Resolution: This section of fencing was repaired on February 23, 2007 by replacing the broken strand of barbed wire. During the July 2007 follow-up inspection, the fencing was observed to be intact and in good repair.

2. **Issue:** During the February 2007 five-year review inspection, inspection participants noted that the outer protective casing on Monitoring well 97MW-6 was damaged. Specifically, the lock hasp was broken off the protective cover.

Resolution: The protective casing associated with monitoring well 97MW-6 was repaired on February 23, 2007 by welding a new lock hasp on the protective cover. During the July 2007 follow-up inspection, the protective outer casing for this well was observed to be intact and in good repair.

IX. Recommendations and Follow-up Actions

Because the two issues, a damaged section of the fencing surrounding the disposal cell and a damaged protective outer casing on monitoring well 97MW-6, have been resolved, there are no recommendations or follow-up actions. Site inspections, modified O&M, and monitoring of ground water will continue.

X. Protectiveness Statement

Because the remedy is protective, the Site is protective of human health and the environment.

This Site met all the site completion requirements as specified in OSWER Directive 9320.2-09A-P, Closeout Procedures for National Priorities List Sites and was closed out on June 16, 2000. Specifically, confirmatory sampling verified that the Site had achieved the 1993 ROD remediation goals, and that all cleanup actions specified in the Site RODs and the Site Action Memorandum had been implemented. The Site risks associated with the tailings and sediment have been eliminated or reduced to acceptable levels through institutional controls, excavation, treatment, and on-site disposal. The only remaining activities that are being performed are O&M activities and ground water monitoring to ensure the protectiveness of the remedy.

XI. Next Review

The next five-year review for the Cleveland Mill Superfund Site is required five years from the signature date of this review.

Attachment 1

Public Notice of Five-Year Review

CLEVELAND MILL SUPERFUND SITE PUBLIC NOTICE

U.S. EPA Region 6 Begins Second Five-Year Review of Site Remedy January 2007



The U.S. Environmental Protection Agency (EPA) is beginning the Second Five-Year Review of the remedy at the Cleveland Mill Superfund Site (the Site) in Grant County, New Mexico, located about 5.5 miles north of Silver City. The purpose of this Five-Year Review is to assure that human health and the environment continue to be protected by the remedy that was implemented at the Site.

Cleanup of the Site was determined to be necessary because disposal of mill tailings had contaminated the soil near the mine site and the sediment in the streambed of Little Walnut Creek. Contaminants included heavy metals such as arsenic, beryllium, cadmium, lead, and zinc. The Site was placed on the Superfund National Priorities List in 1989. The remedy selected for the Site consisted of consolidating and stabilizing the contaminated soil and sediment in a containment cell constructed at the Site. Remedy implementation was completed in 1998. The Site was deleted from the NPL in 2001. Regular monitoring and maintenance of the constructed remedy continues at the Site.

The EPA conducts Five-Year Reviews after a National Priorities List site cleanup is completed where waste remains onsite at levels that do not allow for unlimited use. Since contaminated soil and sediment (inside the containment cell) remain at the Site, the EPA will continue to

conduct Five-Year Reviews at the Cleveland Mill Superfund Site. During the review process, EPA will analyze site ground water data; inspect the cap on the containment cell; evaluate erosion control measures associated with the containment cell; and review the access limitations at the Site. The EPA will also consider any information or concerns that individuals may have about the Site during the review process, which is expected to last until mid-2007.

Information about the Site is located on the Internet at: <http://www.epa.gov/earth1r6/6sf/pdffiles/clv-mill.pdf>

The administrative record for the Site, which includes all major Site documents and reports, is located at the New Mexico Environment Department Santa Fe offices as well as the following local information repository:

Silver City Public Library
5151 West College Avenue
Silver City, New Mexico 88061
(505) 538-3672

You may contact the EPA Remedial Project Manager if you have any questions or concerns about the Site:

Bret Kendrick
U.S. EPA Region 6 (6SF-RL)
(214) 665-2240 or
(800) 533-3508 (toll-free)

CONFIRMED PUBLICATION in the Silver City Daily Press January 18, 2007
CH2M HILL/Bernard Hodes 972-980-2170

Attachment 2

Data Summary Tables

Table 1. Summary of Groundwater Sampling Results

Sample ID	Units EPA Method Number	Time Date Sampled	pH (Lat Q* (field) units)	Total										Q* Zinc mg/L	Q* M200.7					
				TDS mg/L	Sulfate mg/L	Alkalinity mg/L	Acidity mg/L	Q* Bicarbonate mg/L	Carbonate mg/L	Q* Hydroxide mg/L	Q* Arsenic mg/L	Q* Beryllium mg/L	Q* Cadmium mg/L			Q* Copper mg/L	Q* Lead mg/L	Q* Mercury mg/L	Q* Silver mg/L	
NMWQCC Stds	NMWQCC Stds		6-9**	1000**	600**								0.1	0.01	1**	0.05	0.002	0.05	10**	
EPA MCLs	EPA MCLs		6.5-8.5**	500**	250**								0.010 ++	0.004	0.005	1.3	0.015	0.002	0.10**	5**
GWMW-6-1	97MW-6	24-Sep-98	1140	8.1	600	150	316	<2 U					<0.001 U	<0.002 U	<0.003 U	<0.01 U	<0.001 U	<0.0002 U	<0.01 U	<0.01 U
GW-6	97MW-6	19-Nov-98	1140	7.4	530	120	278						<0.001 U	<0.002 U	<0.003 U	<0.01 U	<0.001 U	<0.0002 U	<0.005 U	<0.01 U
MW-6	97MW-6	05-Feb-99	1210	7.4	440	110	259	<2 U					<0.001 U	<0.002 U	<0.003 U	<0.01 U	<0.001 U	<0.0002 U	<0.005 U	<0.01 U
MW-6	97MW-6	30-Nov-99	1045	7.4	430	80	273	<2 U					<0.001 U	<0.002 U	<0.003 U	<0.01 U	0.026	<0.0002 U	<0.005 U	<0.01 U
MW-6	97MW-6	24-Mar-00	1830	8.1	410	80	267	<2 U					0.001	<0.002 U	<0.003 U	<0.01 U	<0.015 U	<0.0002 U	<0.005 U	<0.01 U
MW-6	97MW-6	27-Jun-00	1257	7.3	410	80	261	<2 U					<0.001 U	<0.002 U	<0.003 U	<0.01 U	<0.020 U	<0.0002 U	<0.005 U	<0.01 U
MW-6	97MW-6	04-Jan-01	1155	7.6	420	90	238	<2 U					<0.001 U	<0.002 U	<0.003 U	<0.01 U	0.007	<0.0002 U	<0.005 U	<0.01 U
GW-6	97MW-6	18-Jul-01	1330	7.5	430	90	251	<2 U	251	<2 U	<2 U	0.001 B	<0.002 U	<0.003 U	<0.01 U	0.01	<0.0002 U	<0.005 U	0.02 B	<0.01 U
MW-6	97MW-6	08-Jan-02	10:00	7.9 H	420	100	235	<2 U	235	<2 U	<2 U	<0.001 U	<0.002 U	<0.003 U	<0.01 U	0.036	<0.0002 U	<0.005 U	<0.01 U	<0.01 U
MW-6	97MW-6	17-Jul-02	9:15	7.2 H	450	90	249	<2 U	249	<2 U	<2 U	<0.001 U	<0.002 U	<0.003 U	<0.01 U	0.007	<0.0002 U	<0.005 U	<0.01 U	<0.01 U
DUP-1 (Dupe of MW-6)	97MW-6	17-Jul-02	9:00	7.3 H	440	90	249	<2 U	249	<2 U	<2 U	<0.005 U	<0.002 U	<0.003 U	<0.01 U	<0.001 U	<0.002 U	<0.005 U	0.01 B	<0.01 U
MW-6	97MW-6	30-Jul-03	10:25		500	100	269	<2.0 U	269	<2.0 U	<2.0 U	0.0013 B	<0.002 U	<0.0001 U	<0.01 U	0.0054			0.01 B	<0.01 U
MW-6	97MW-6	13-Jul-04	9:34		7.1	420	90	242	<2 U	242	<2 U	<2 U	<0.0005 U	<0.002 U	<0.0001 U	<0.01 U	0.0056			<0.01 U
MW-6	97MW-6	20-Jul-05	10:32		7.2	420	90	251	<2 U	251	<2 U	<2 U	0.0009 B	<0.002 U	<0.0001 U	<0.01 U	0.0034			<0.01 U
MW-6	97MW-6	11-Jul-06	9:23		7.1	430	94	260	<2 U	260	<2 U	<2 U	0.0006 B	<0.0001 U	<0.0001 U	<0.01 U	0.0034			<0.01 U
DUP	97MW-6	11-Jul-06	8:30		7.1	410	93.7	260	<2 U	260	<2 U	<2 U	0.0006 B	<0.0001 U	<0.0001 U	<0.01 U	0.0037			<0.01 U
Dry - No Sample	MW-7	25-Sep-98	17:15	Dry - No Sample																
Dry - No Sample	MW-7	19-Nov-98	15:19	Dry - No Sample																
Dry - No Sample	MW-7	04-Feb-99	10:20	Dry - No Sample																
Dry - No Sample	MW-7	10-Jun-99	10:25	Dry - No Sample																
Dry - No Sample	MW-7	06-Sep-99	12:00	Dry - No Sample																
Dry - No Sample	MW-7	18-Jul-01	9:45	Dry - No Sample																
Dry - No Sample	MW-7	08-Jan-02	16:09	Dry - No Sample																
Dry - No Sample	MW-7	17-Jul-02	11:45	Dry - No Sample																
Dry - No Sample	MW-7	30-Jul-03		Dry - No Sample																
Dry - No Sample	MW-7	13-Jul-04	12:30	Dry - No Sample																
Dry - No Sample	MW-7	20-Jul-05		Dry - No Sample																
Dry - No Sample	MW-7	11-Jul-06		Dry - No Sample																

Q* = Data Qualifiers: U = Undetected

B = Between the PQL and MDL

H = Holding time was exceeded

** = Secondary Standard

*** = Irrigation Use Standard

++ = As of 1/12/2006

Italics = Dissolved metals; All other metal concentrations are total metals

Attachment 3

Interview Record Forms

Five-Year Review Interview Record

Cleveland Mill Site, Silver City, New Mexico

SITE INFORMATION

Site Name: Cleveland Mill
EPA I.D. No.: NMD981155930

INTERVIEW INFORMATION

Interviewee	Address	Phone	Date of Interview	Interview Method
Lynn Asch Nearby property owner	Little Walnut Creek Rd. Silver City, NM		February 22, 2007	In Person

Interview Transcribed by:	Organization	Phone	Address	E-mail
Bret Kendrick	EPA Region 6	(214) 665-2240	1445 Ross Ave. Suite 1200 Dallas, TX 75202	kendrick.bret@epa.gov

INTERVIEW QUESTION AND RESPONSE

This is the second five-year review for the Cleveland Mill Site. As part of the five-year review process, EPA may interview State, County, and City officials, as well as people who work or live near the site. These interviews may provide additional information about the site's status and/or identify remedy issues.

Please describe any issues, complaints, or concerns that you may have regarding the Cleveland Mill Site.

Response:

Ms. Asch asked about the ground water quality, specifically if it might impact her drinking of water well. EPA and NMED staff stated that analytical results collected during the monitoring of the disposal cell indicates that no contaminants from the cell are leaking into the shallow drinking water aquifer. Ms. Asch did not have any issues, complaints, or concerns with the Site.

Five-Year Review Interview Record

Cleveland Mill Site, Silver City, New Mexico

SITE INFORMATION

Site Name: Cleveland Mill
EPA I.D. No.: NMD981155930

INTERVIEW INFORMATION

Interviewee	Address	Phone	Date of Interview	Interview Method
Dori Dominguez, Subdivision Ordinance Office for Grant County	1400 Hwy 180 East Silver City, NM 88061	(505) 574-0018	February 23, 2007	In Person

Interview Transcribed by:	Organization	Phone	Address	E-mail
Bret Kendrick	EPA Region 6	(214) 665-2240	1445 Ross Ave. Suite 1200 Dallas, TX 75202	kendrick.bret@epa.gov

INTERVIEW QUESTION AND RESPONSE

This is the second five-year review for the Cleveland Mill Site. As part of the five-year review process, EPA may interview State, County, and City officials, as well as people who work or live near the site. These interviews may provide additional information about the site's status and/or identify remedy issues.

Please describe any issues, complaints, or concerns that you may have regarding the Cleveland Mill Site.

Response:

Ms. Dominguez was not aware of any issues, complaints, or concerns regarding the Site.

Ms. Dominguez was also not aware of the waste repository on the site or the associated land use restrictions.

Five-Year Review Interview Record

Cleveland Mill Site, Silver City, New Mexico

SITE INFORMATION

Site Name: Cleveland Mill
EPA I.D. No.: NMD981155930

INTERVIEW INFORMATION

Interviewee	Address	Phone	Date of Interview	Interview Method
Gilbert Helton, Code Enforcement Officer for Grant County	1400 Hwy 180 East Silver City, NM 88061	(505) 574-0004	February 23, 2007	In Person

Interview Transcribed by:	Organization	Phone	Address	E-mail
Bret Kendrick	EPA Region 6	(214) 665-2240	1445 Ross Ave. Suite 1200 Dallas, TX 75202	kendrick.bret@epa.gov

INTERVIEW QUESTION AND RESPONSE

This is the second five-year review for the Cleveland Mill Site. As part of the five-year review process, EPA may interview State, County, and City officials, as well as people who work or live near the site. These interviews may provide additional information about the site's status and/or identify remedy issues.

Please describe any issues, complaints, or concerns that you may have regarding the Cleveland Mill Site.

Response:

Mr. Helton was not aware of any issues, complaints, or concerns regarding the Site.

Mr. Helton was not aware of the waste repository on the site or the associated land use restrictions. He affirmed that the County does not have any ordinances that would allow him to enforce such a restriction. All permits in Grant County are issued by the State out of Las Cruces.

Five-Year Review Interview Record

Cleveland Mill Site, Silver City, New Mexico

SITE INFORMATION

Site Name: Cleveland Mill
EPA I.D. No.: NMD981155930

INTERVIEW INFORMATION

Interviewee	Address	Phone	Date of Interview	Interview Method
James Marshall, Mayor of Silver City	Box 1188 Silver City, NM 88062	(505) 538-3731	February 23, 2007	In Person

Interview Transcribed by:	Organization	Phone	Address	E-mail
Bret Kendrick	EPA Region 6	(214) 665-2240	1445 Ross Ave. Suite 1200 Dallas, TX 75202	kendrick.bret@epa.gov

INTERVIEW QUESTION AND RESPONSE

This is the second five-year review for the Cleveland Mill Site. As part of the five-year review process, EPA may interview State, County, and City officials, as well as people who work or live near the site. These interviews may provide additional information about the site's status and/or identify remedy issues.

Please describe any issues, complaints, or concerns that you may have regarding the Cleveland Mill Site.

Response:

Mayor Marshall was not aware of any issues, complaints, or concerns regarding the Site.

Five-Year Review Interview Record

Cleveland Mill Site, Silver City, New Mexico

SITE INFORMATION

Site Name: Cleveland Mill
EPA I.D. No.: NMD981155930

INTERVIEW INFORMATION

Interviewee	Address	Phone	Date of Interview	Interview Method
Peter Russell, Community Development Dir. for Silver City	Box 1188 Silver City, NM 88062	(505) 538-3731	February 22, 2007	In Person

Interview Transcribed by:	Organization	Phone	Address	E-mail
Bret Kendrick	EPA Region 6	(214) 665-2240	1445 Ross Ave. Suite 1200 Dallas, TX 75202	kendrick.bret@epa.gov

INTERVIEW QUESTION AND RESPONSE

This is the second five-year review for the Cleveland Mill Site. As part of the five-year review process, EPA may interview State, County, and City officials, as well as people who work or live near the site. These interviews may provide additional information about the site's status and/or identify remedy issues.

Please describe any issues, complaints, or concerns that you may have regarding the Cleveland Mill Site.

Response:

The Cleveland Mill Site is not in Mr. Russell's jurisdiction. However, Mr. Russell stated that he was not aware of any issues, complaints, or concerns regarding the Site.

Five-Year Review Interview Record

Cleveland Mill Site, Silver City, New Mexico

SITE INFORMATION

Site Name: Cleveland Mill
EPA I.D. No.: NMD981155930

INTERVIEW INFORMATION

Interviewee	Address	Phone	Date of Interview	Interview Method
Paul & Patricia Unger Nearby property owners	5156 Little Walnut Creek Rd. Silver City, NM		February 22, 2007	In Person

Interview Transcribed by:	Organization	Phone	Address	E-mail
Bret Kendrick	EPA Region 6	(214) 665-2240	1445 Ross Ave. Suite 1200 Dallas, TX 75202	kendrick.bret@epa.gov

INTERVIEW QUESTION AND RESPONSE

This is the second five-year review for the Cleveland Mill Site. As part of the five-year review process, EPA may interview State, County, and City officials, as well as people who work or live near the site. These interviews may provide additional information about the site's status and/or identify remedy issues.

Please describe any issues, complaints, or concerns that you may have regarding the Cleveland Mill Site.

Response:

Mr. and Ms. Unger did not have any issues, complaints, or concerns regarding the Site. Mr.

Unger noted that the water was clear and they do not smell sulfur anymore. He also sees
tadpoles and bugs which had not been there seven years ago.

Five-Year Review Interview Record

Cleveland Mill Site, Silver City, New Mexico

SITE INFORMATION

Site Name: Cleveland Mill
EPA I.D. No.: NMD981155930

INTERVIEW INFORMATION

Interviewee	Address	Phone	Date of Interview	Interview Method
Rock Vendrely NMED	District Field Office Silver City, NM	(505) 388-1934	February 22, 2007	In Person

Interview Transcribed by:	Organization	Phone	Address	E-mail
Bret Kendrick	EPA Region 6	(214) 665-2240	1445 Ross Ave. Suite 1200 Dallas, TX 75202	kendrick.bret@epa.gov

INTERVIEW QUESTION AND RESPONSE

This is the second five-year review for the Cleveland Mill Site. As part of the five-year review process, EPA may interview State, County, and City officials, as well as people who work or live near the site. These interviews may provide additional information about the site's status and/or identify remedy issues.

Please describe any issues, complaints, or concerns that you may have regarding the Cleveland Mill Site.

Response:

Mr. Vendrely was not aware of any complaints or issues regarding the Site. He remarked that the vegetation at the Site looks good and the acid drainage is gone. However, he did have concerns about the continued residential development of the land in the vicinity of the Site and the potential risks that may be associated with the encroaching development. There is a residential subdivision planned that will be located south of the Site, but it will be on city water. Mr. Vendrely said there are no provisions for NMED review/input on building permits issued in the area; therefore, NMED would not be able to prevent potential future development on the

Site waste repository. Building permits and inspections are overseen by the state inspectors out of Las Cruces. Grant County officials do not review or approve building permits.

Attachment 4

Site Inspection Photographs