

affected by the force majeure.

XI. STIPULATED AND STATUTORY PENALTIES

103. Any failure by Respondents to perform a requirement of this Order is a violation of this Order. For each day, or portion thereof, that Respondents fail to perform, fully, any requirement of this Order in accordance with the schedules established pursuant to this Order, Respondents shall be liable for stipulated penalties as follows:

<u>Penalty per Day per failure to perform a requirement of this Order:</u>	<u>Period of failure to perform:</u>
\$1,000	1 - 7 days
\$3,000	8 - 21 days
\$5,000	22 or more days

However, in the event that EPA assumes performance of the Removal Action pursuant to Section XII (RESERVATION OF RIGHTS) of this Order or paragraph 106 of this Order, Respondents shall be liable for a stipulated penalty in the amount of \$250,000.

104. Upon receipt of EPA's written demand for penalty payment, Respondents shall make payment to EPA within 30 days and interest shall accrue on late payments in accordance with Section VIII (REIMBURSEMENT OF COSTS) of this Order.

105. Even if violations are simultaneous, separate penalties shall accrue for separate violations of this Order. Penalties accrue and are assessed per violation per day. Penalties shall accrue regardless of whether EPA has notified Respondents of a violation or act of noncompliance. The payment of penalties shall not alter in any way Respondents' obligation to complete the performance of the requirements of this Order.

106. Willful violation, or failure, or refusal to comply with any provision of this Order may subject Respondents to civil penalties of up to twenty-five thousand dollars (\$25,000) per violation per day, as provided in Section 106(b)(1) of CERCLA, 42 U.S.C. §9606(b)(1). Respondents may also be subject to punitive damages in an amount up to three times the amount of any cost incurred by the United States as a result of such violation, as provided in Section 107(c)(3) of CERCLA, 42 U.S.C. §9607(c)(3). Should Respondents violate this Order or any portion hereof, EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial

enforcement of this Order pursuant to Section 106 of CERCLA, 42 U.S.C. §9606.

XII. RESERVATION OF RIGHTS

107. Except as specifically provided in this Order nothing herein shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, except as provided in Section XIV (COVENANT NOT TO SUE) nothing herein shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Order, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law. EPA reserves the right to bring an action against Respondents under Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any response costs incurred by the United States related to this Order or the Site and not reimbursed by Respondents. Notwithstanding any other provision of this Order, the Parties reserve all of their rights under the Consent Decree.

XIII. OTHER CLAIMS

108. By issuance of this Order, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The United States or EPA shall not be deemed a party to any contract entered into by Respondents or their directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Order.

109. Except as expressly provided in Section XIV (COVENANT NOT TO SUE), nothing in this Order constitutes a satisfaction of or release from any claim or cause of action against the Respondents or any person not a party to this Order, for any liability Respondents or such person may have under CERCLA, other statutes, or the common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106(a) and 107(a) of CERCLA, 42 U.S.C. §§ 9606(a) and 9607(a).

110. This Order does not constitute a preauthorization of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2). Respondents waive any claim to payment under Sections 106(b), 111, and 112 of CERCLA, 42 U.S.C. §§ 9606(b),

9611, and 9612, against the United States or the Hazardous Substance Superfund arising out of any action performed under this Order.

111. No action or decision by EPA pursuant to this Order shall give rise to any right to judicial review except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XIV. COVENANT NOT TO SUE

112. Except as otherwise specifically provided in this Order, upon issuance of the EPA notice referred to in Section XX (NOTICE OF COMPLETION), EPA covenants not to sue Respondents for judicial imposition of damages or civil penalties or to take administrative action against Respondents for any failure to perform the Removal Action agreed to in this Order except as otherwise reserved herein.

113. Except as otherwise specifically provided in this Order, in consideration and upon Respondents' payment of response costs specified in Section VIII of this Order (REIMBURSEMENT OF COSTS), EPA covenants not to sue or to take administrative action against Respondents under Section 107(a) of CERCLA for recovery of future response costs paid by the United States in connection with this Removal Action or this Order. This covenant not to sue shall take effect upon the receipt by EPA of the payments required by Section VIII (REIMBURSEMENT OF COSTS).

114. These covenants not to sue, set forth in this Section of the Order, are conditioned upon the complete and satisfactory performance by Respondents of the requirements of this Order. These covenants not to sue extend only to the Respondents, Respondents' officers, directors, employees, successors or assigns and do not extend to any other person.

XV. CONTRIBUTION PROTECTION

115. With regard to claims for contribution against Respondents for matters addressed in this Order, the parties hereto agree that Respondents are entitled to protection from contribution actions or claims to the extent provided by Section 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. §§9613(f)(2) and 9622(h)(4).

116. Nothing in this Order precludes parties from asserting any claims, causes of action or demands against any persons not parties to this Order for indemnification, contribution, or cost recovery.

XVI. INDEMNIFICATION

117. Respondents agree to indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action: (A) arising from, or on account of, acts or omissions of Respondents, Respondents' officers, directors, employees, agents, contractors, subcontractors, receivers, trustees, successors or assigns, in carrying out actions pursuant to this Order; and (B) for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between (any one or more of) Respondents, and any persons for performance of Work on or relating to the Site, including claims on account of construction delays. In addition, Respondents agree to pay the United States all costs incurred by the United States, including litigation costs arising from or on account of claims made against the United States based on any of the acts or omissions referred to in the preceding paragraph. Respondents waive all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between (any one or more of) Respondents and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XVII. INSURANCE

118. At least seven (7) days prior to commencing any on-site Work under this Order, Respondents shall secure, and shall maintain for the duration of this Order, comprehensive general liability insurance and automobile insurance with limits of 2 million dollars, combined single limit. Within the same time period, Respondents shall provide EPA with certificates of such insurance and a copy of each insurance policy. If Respondents demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then the Respondents need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XVIII. FINANCIAL ASSURANCE

119. Within five days after the effective date of this Order and every year thereafter until notice of completion of Work under Section XX(NOTICE OF COMPLETION), Respondents shall demonstrate to EPA that they meet one of the financial assurance mechanisms specified in 40 CFR Section 264.143 for the sufficient

estimated costs of Work to be performed by the Respondents under this Order. For purposes of the financial assurance mechanisms set forth in 40 CFR § 264.143, Respondents may use net worth in lieu of tangible net worth.

XIX. MODIFICATIONS

120. Modifications to any plan or schedule or SOW may be made in writing by the RPM or at the RPM's oral direction. If the RPM makes an oral modification, it will be memorialized in writing within two days; provided, however, that the effective date of the modification shall be the date of the RPM's oral direction. Any other requirements of the Order may be modified in writing by mutual agreement of the parties.

121. If Respondents seek permission to deviate from any approved Work Plan, schedule or SOW, Respondents' Project Coordinator shall submit a written request to EPA for approval outlining the proposed Work Plan, schedule, or SOW modification and its basis.

122. No informal advice, guidance, suggestion, or comment by EPA regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain such formal approval as may be required by this Order, and to comply with all requirements of this Order unless the Order is formally modified.

XX. NOTICE OF COMPLETION

123. When EPA determines, after EPA's review of the Final Report, that the Removal Action has been fully performed in accordance with this Order and that all Performance Standards are met, with the exception of any continuing obligations required by this Order, including record retention, EPA will provide notice to Respondents. If EPA determines that any part of the Removal Action has not been completed in accordance with this Order, EPA will notify Respondents, provide a list of the deficiencies, and require Respondents to submit a schedule, for EPA review and approval, under which Respondents shall correct such deficiencies. Respondents shall, according to the EPA-approved schedule, take actions to correct any deficiencies identified by EPA in accordance with the EPA notice. Failure by Respondents to correct deficiencies according to the schedule shall be a violation of this Order.

XXI. SEVERABILITY

124. If a court issues an order that invalidates any provision of this Order or finds that Respondents have sufficient cause not to comply with one or more provisions of this Order, Respondents shall remain bound to comply with all provisions of this Order not invalidated or determined to be subject to a sufficient cause defense by the court's order.

XXII. EFFECTIVE DATE

125. This Order may be executed in any number of counterparts, each of which when executed and delivered to EPA shall be deemed to be an original, but such counterparts shall together constitute one and the same document. This Order shall be effective five days after the Order is signed by the EPA Region 6 Superfund Division Director.

XXIII. APPENDICES

The following is a list of the attached appendices which are incorporated into this Order:

- Appendix A: - Map of the Cleveland Mill Superfund Site
- Appendix B: Record of Decision, Cleveland Mill Superfund Site (September 22, 1993)
- Appendix C: Action Memorandum for the Removal Action at the Cleveland Mill Superfund Site (July 11, 1997)
- Appendix D: Removal Action Statement of Work for the Cleveland Mill Superfund Site

CERCLA 06-14-97

007145

The undersigned representative of Bayard Mining Corp. certifies that he is fully authorized to enter into the terms and conditions of this Order regarding the physical removal for the Cleveland Mill Superfund Site, Docket Number CERCLA 06-14-97 and to bind the party he represents to this document.

Agreed this 15th day of September, 1997.

By Larry L. Barker

Title President

The undersigned representative of Mining Remedial Recovery Company certifies that he is fully authorized to enter into the terms and conditions of this Order regarding the physical removal for the Cleveland Mill Superfund Site, Docket Number CERCLA 06-14-97 and to bind the party he represents to this document.

Agreed this 9th day of September, 1997.

By Michael W Baum

Title President

CERCLA 06-14-97

007147

It is so ORDERED and Agreed this 18 day of September, 1997.

BY: Myron O. Knudson
Superfund Division Director
Region 6
U.S. Environmental Protection Agency

DATE: 9/18/97

Regarding the physical removal action at the Cleveland Mill
Superfund Site Docket Number CERCLA 06-14-97

EFFECTIVE DATE: 9/23/97

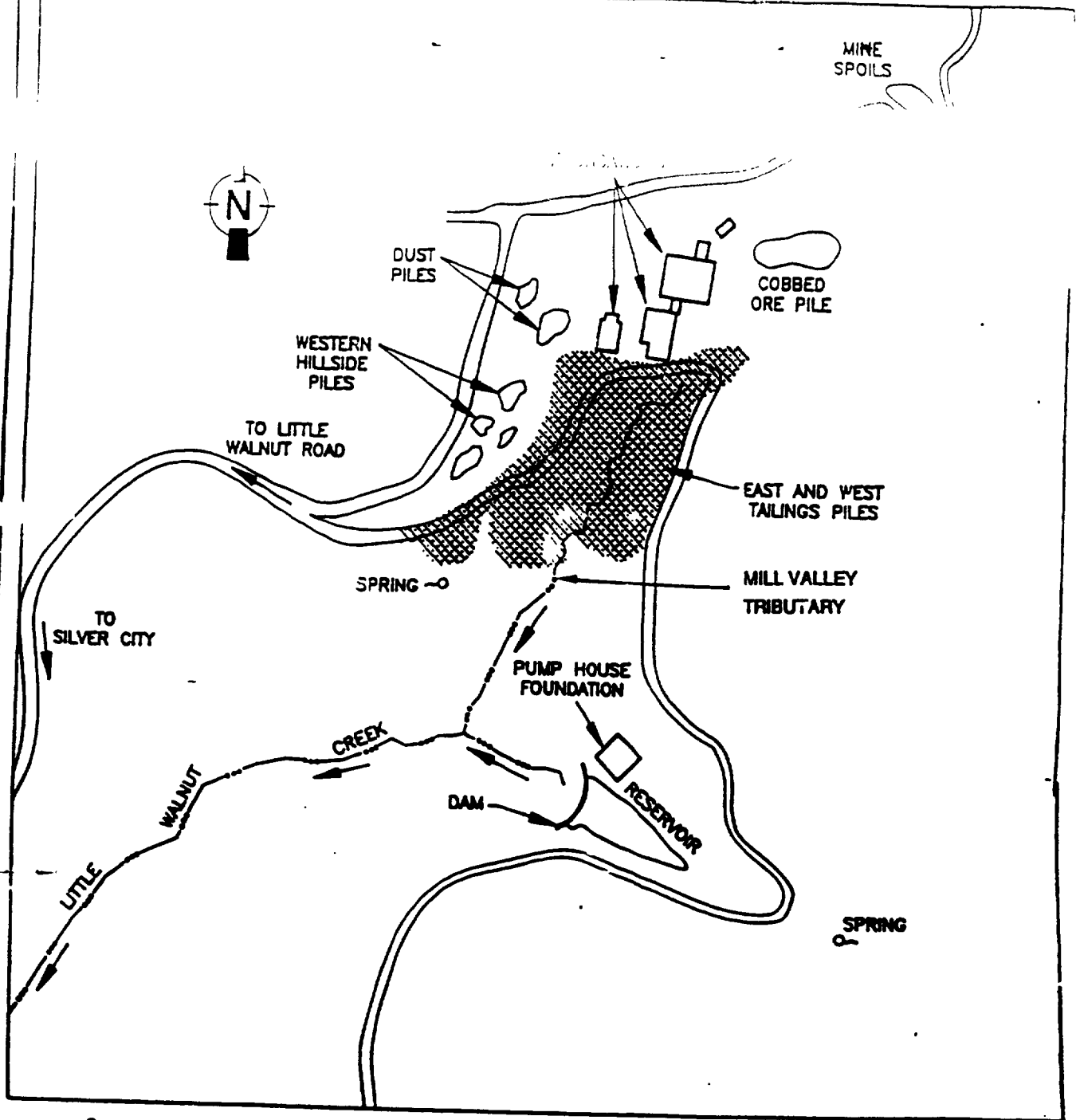


FIGURE 2

CLEVELAND MILL SUPERFUND SITE Grant County, New Mexico	
TITLE:	
MILL AREA MAP	
Project No. EN3017	
ecology & environment, inc. ALBUQUERQUE, NEW MEXICO	
Date: 10/92	Drawn by: RSM
Scale: 1" = 600'	

Source: Modified from Site Screening Report (EPA 1990)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200

007149

JUL 11 1997

MEMORANDUM

SUBJECT: Request for a Time-Critical Removal Action at the Cleveland Mill Superfund Site, Grant County, New Mexico

FROM: Kathleen A. Aisling, Remedial Project Manager
Technical Support Team (6SF-LT)

TO: Myron O. Knudson, P.E., Director
Superfund Division (6SF)

THRU: Carl Edlund, Chief
Louisiana/New Mexico Branch (6SF-L)

I. PURPOSE

This memorandum requests approval for a time-critical Removal Action, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104, 42 U.S.C. § 9604, at the Cleveland Mill Superfund Site (the "Site") in Grant County, New Mexico. The proposed action is intended to physically address surficial contamination, and to restore affected surface areas at the Site.

This action meets the criteria for initiating a Removal Action under Section 300.415 of the National Contingency Plan (NCP), 40 CFR § 300.415. In accordance with 40 CFR § 300.415(a)(2), an effort has been made to determine whether or not the responsible parties can and will perform the Removal Action. The potentially responsible parties, Bayard Mining Corporation ("Bayard"), Mining Remedial Recovery Company ("MRRC"), and Viacom International Inc. ("Viacom") (Viacom is a responsible party as a result of a merger with Paramount Communications, Inc.) (hereinafter the PRPs) have entered into negotiations with the U.S. Environmental Protection Agency (EPA) with the goal of solidifying the legal agreement through which they will perform the Removal Action in a prompt and proper manner. This Removal Action is not being initiated under the On-Scene Coordinator's \$50,000 authority.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS #: NMD981155030

Category of Removal: Fine Critical/Enforcement

Site ID: G9

A. Site Description

1. Removal site evaluation

The Site occupies about 18 acres in southwestern New Mexico, approximately 5.5 miles north of Silver City in Grant County (Attachment 1). The Cleveland Mine is located approximately $\frac{1}{2}$ mile north of the Cleveland Mill main tailings piles. Mining and milling operations intermittently occurred at the Site from the early 1900s until at about 1950.

Generally speaking, the source of the hazardous substances at the Site is approximately 30,000 cubic yards of tailings from milling operations at the Site, and 35,000 cubic yards of waste ore which are in piles around the mill foundations and near the mine portal. The tailings and waste ore are located at the headwaters of an intermittent stream known as Little Walnut Creek. Approximately 6,000 cubic yards of tailings and sediment have been deposited along a $1\frac{1}{2}$ mile stretch of the streambed.

The mill foundations and main tailing piles cover an area of approximately four acres while the contaminated streambed covers an area of approximately 10 acres. Precipitation runoff from the Site into Little Walnut Creek is acidic and contributes to the leaching of metals from the tailings and waste ore. In addition, tailings and sediment that have washed downstream at the Site may act as a source of contamination when they are contacted by rainwater.

For the purposes of this Action Memorandum, "tailings and sediment" shall mean the on-site contaminated material that contains hazardous substances at concentrations which exceed the remedial action goals described in this Action Memorandum, including, without limitation, the main (east and west) tailings piles, the cobbed ore pile, mine spoils, western hillside piles, roadbed soils, dust piles, mining and milling wastes, streambed accumulations, contaminated soils and any other contaminated material of any kind at the Site. (Attachment 2.)

Citizen complaints to the New Mexico Environment Department (NMED) and to its predecessor, the New Mexico Environmental Improvement Division (NMEID) (hereinafter NMED and its predecessor NMEID are referred to as NMED), led to NMED's 1985 identification of the Site as an area of potential concern. As a result of the complaints, NMED conducted a Preliminary Assessment

in October 1985 and in November 1986 under the provisions of CERCLA. A more detailed Superfund Site Assessment was conducted by the EPA Technical Assistance Team in August 1988.

The Site was proposed for inclusion on the National Priorities List (NPL) in June 1988 (53 Fed. Reg. 23988 (June 24, 1988)). In March 1989, the EPA added the Cleveland Mill Site to the NPL pursuant to Sections 105 of CERCLA, 42 U.S.C. Section 9605, qualifying the Site for remedial action under CERCLA (54 Fed. Reg. 13296 (March 31, 1989)). A remedial investigation (RI) was conducted at the Site from 1991 through 1992. EPA issued a Record of Decision (ROD) for the Site on September 22, 1993, describing EPAs selected remedy for the long term remediation at the Site (as explained below in this memorandum).

The Site areas to be addressed by this Removal Action are the sources of contamination at the Site described in this section of the Action Memorandum. Also, this Action Memorandum calls for restoration of affected surface areas at the Site. Affected surface areas are those areas which will be disturbed by excavation or disposal of the tailings and sediment during this removal action.

This Action Memorandum does not concern the remediation of ground water contamination on the Site or any of the other actions (e.g., Operation and Maintenance (O&M) of the remedy) described in the ROD, which the PRPs have agreed to undertake pursuant to the judicial Consent Decree styled United States of America and New Mexico Office of the Natural Resources Trustee v. Bayard Mining Corp. et al., No. 95-0285 MV/LFG (D. New Mexico (Albuquerque) which was entered June 15, 1995 (hereinafter the Consent Decree.)

2. Physical location

The Cleveland Mill Superfund Site is located on private land at the end of Forest Service Road 804 in Grant County, New Mexico. The Site is situated within the Northeast quarter of Section 2, Township 17 South, Range 14 West at the headwaters of a small tributary of Little Walnut Creek. The Continental Divide runs east and west between the mine to the north and the mill to the south. The Site includes material discarded during mining and ore processing operations, a water storage reservoir, access roads and other roads which traverse the Site, building foundations (including the mill foundation), the mine portal, and the surrounding areas consisting of about 4 acres. The Site also encompasses about 10 acres in and along the streambed of both a small tributary to Little Walnut Creek, the "mill valley tributary", and Little Walnut Creek itself. The Site is surrounded by private lands. The total Site area is approximately 18 acres. (See Attachment 2.)

The Site is located in a developing residential area. Although there are no identified sensitive or vulnerable populations, habitats, or natural resources on-site, the Site is situated adjacent to the Cila National Forest. Currently, land use in the areas directly adjacent to the Site is primarily recreational with some small scale agriculture and livestock grazing. The reservoir located on the Site, adjacent to the mill area, has been used for swimming and fishing by local residents. Current residences are concentrated downstream from the Site, along Little Walnut Creek; however, Grant County has recently given permits to developers to sell lots on three large tracks of land adjacent to the Site.

The population within a four-mile radius of the Site is estimated at 1,300 people, almost all of whom rely on private wells for potable water and agricultural uses. The nearest residence, located approximately 3,200 feet south-southwest of the tailings piles, does not have a well and imports water for domestic use. The nearest domestic well is located approximately 4,600 feet south-southwest of the contaminated tailings piles which are located on the Site.

3. Site characteristics

The Site encompasses an area which has been used for the disposal of mining and ore processing materials since the early 1900s. A large-scale mine and a flotation mill were operated at the Site during the period from about 1910 to 1919 and smaller mining operations continued until about 1950. The metals extracted from the ore in the area were principally lead and zinc. There are no longer any buildings at the Site and only the foundations of the mill remain. The Site is currently owned by MRRRC and Bayard, both private companies; but the land is not utilized for business activities. Recreational trespassers (e.g., hunters and hikers) frequent the Site.

Releases at the Site are the result of wind, rainwater and spring water acting upon the contaminated tailings and sediment. The rainwater and spring water causes metal-laden surface water, and tailings and sediment to travel from the Site into Little Walnut Creek. The action proposed in this Action Memorandum is the first Removal Action conducted at the Site. Previous remedial action activities are described in Section II.B of this memorandum.

4. Release or threatened release into the environment of hazardous substance, pollutant or contaminant

The principal contaminants of concern at the Site are arsenic, beryllium, cadmium, lead, and zinc, in approximately 71,000 cubic yards of contaminated tailings and sediment.

The arsenic, beryllium, cadmium, lead, and zinc which is found in the tailings and sediment at the Site are hazardous substances as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and further defined at 40 CFR § 300.5. The arsenic, beryllium, cadmium, lead, and zinc which are found in the tailings and sediment are solid waste under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901 *et seq*; however, these materials are specifically exempt from regulation as a RCRA hazardous waste under RCRA Section 3001 (b)(3)(ii), 42 U.S.C. § 6921(b)(3)(ii) and under 40 CFR § 261.4(b)(7) because they are "solid wastes from the extraction, beneficiation, and processing of ores and minerals". See also 51 FR 24496, July 3, 1986.

Based on extensive sampling data, the volume of contaminated tailings and sediment has been estimated as shown in Table 1. The data in Table 1 is taken from the March 1993 RI Report prepared for the NMED by Ecology and Environment.

Table 1- Waste Areas and Volumes of Contaminated Material

Waste Area	Volume (cubic yards)
Main Tailings-Piles	30,000
Cobbed Ore Pile	15,000
Mine Spoils	15,000
Creek Sediment	6,000
Western Hillside Waste Piles	2,500
Roadbed Soils	1,500
Dust Piles	900
Total Volume	70,900

The concentration of one or more of the contaminants of concern in each of these areas is above the Remedial Action Goals established in the ROD. A Remedial Action Goal is the allowable concentration of a contaminant which may remain in a specific medium (such as soil, surface water or ground water) at the Site,

after implementation of the remedial action. Remedial Action Goals for the Site (Table 2) were established in a manner which provides acceptable exposure levels that are protective of human health and the environment and by considering applicable or relevant and appropriate requirements (ARARs) set under federal environmental or state environmental laws, if available. The Remedial Action Goals will be utilized in this Removal Action; that is, the tailings and sediment at the Site will be excavated until the concentration of contaminants in the remaining soil is less than the Remedial Action Goals.

The oxidized metals came to be located at the Site as follows: (1) Through the mining process which took place at the Site, sulfide-bearing ores were brought to the surface, exposing the ores to an oxygen-rich atmosphere; (2) the milling process then ground the oxidized ore into finer particles and increased the exposed surface area of the sulfides; (3) the increased surface area further enhanced the oxidation process and released many of the elements, including arsenic, beryllium, cadmium, lead, and zinc, from their sulfide complexes.

Continued migration of hazardous substances including arsenic, beryllium, cadmium, lead, or zinc occurs at the Site through the following ongoing leaching process: (1) atmospheric oxygen at the surface of the tailings and sediments or atmospheric oxygen in the vadose zone of the tailings and sediments reacts with the sulfide minerals (e.g., pyrite (FeS_2), chalcopyrite (CuFeS_2), sphalerite (ZnS), and galena (PbS)) causing an oxidation reaction which releases hydrogen, sulfate, and the accompanying metals to the environment; (2) the sulfate generated by the reaction combines with available water, creating a concentrated sulfuric acid which leaches through the tailings and sediment, dissolving and transporting high concentrations of deleterious elemental metals including without limitation arsenic, beryllium, cadmium, lead, and zinc; (3) the contaminated water then migrates downward through the tailings into the subsurface, and seeps onto the surface in what we call "leachate seeps" at the base of the tailings, or else the contaminated water flows overland into the mill valley tributary and into the Little Walnut Creek streambed.

The fine-grained nature of the tailings also increases the potential for off-site migration of particulates, via the air pathway (i.e., the wind could blow these particles off-site). The potential for Site contaminants to migrate via the air route was evaluated during the RI through the collection of Site-specific meteorological data, air samples, and surface soil samples. Results of this data collection indicate that contaminant migration via air dispersal occurred at the Site during the air sampling portion of the RI field investigation. This air transport mechanism provides the potential for receptor exposure from contaminated tailings and sediment.

TABLE 2 - FINAL REMEDIAL ACTION GOALS FOR THE CLEVELAND MILL SUPERFUND SITE

Final Remedial Action Goals					Corresponding Risk Levels	
<u>Medium</u>	<u>Chemical</u>	<u>Remediation Level (ppm)</u>	<u>Point of Compliance</u>	<u>Basis of Goal</u>	<u>Chemical Specific RME Risk (a)</u>	
					<u>Cancer Risk</u>	<u>Non-Cancer Hazard Index</u>
Tailings and Sediment	Arsenic	30	All Site Grounds	Background	1.1E-04	0.41
	Beryllium	4		Background	3.6E-05	3.4E-03
	Cadmium	140		Risk	7.1E-07	1
	Lead	500		UBK Model	N/A	N/A
	Zinc	82000		Risk	N/A	1

Footnote (a): Cancer risks are measured as individual incremental lifetime; non-cancer as Hazard Indices. RME = reasonable maximum exposure.

The potential for Site contaminants to migrate due to the infiltration of water into contaminant sources and the subsequent leaching of contaminants into surface water, was evaluated during the RI through collection and analysis of tailings and sediment samples, tailings and sediment leachate samples, and surface and ground water samples. Results of these analyses indicate that leachate from contaminated tailings and sediment is a mechanism for Site contaminant migration into surface water. Additionally, perched ground water in the immediate vicinity of the Site appears to have been contaminated by the leachate, a problem which will be addressed in the remedial action for the Site. Potential infiltration of surface water contaminants into downstream aquifers is also a mechanism for contaminant transport.

The potential for Site contaminants to migrate via physical transport by surface water run-off was evaluated during the RI by the collection of streambed sediment and water samples, and by the collection of reservoir sediment and water samples. The results of sample analysis indicated that contaminant migration via surface run-off has occurred at the Site.

Since the time the ROD was issued in 1993, contaminant migration has occurred due to infiltration of the tailings by rainwater and due to the action of springs located under the tailings. In addition, during periods of heavy rainfall (1-2 inches in 24 hours), the mechanical action of the stormwater has transported tailings downstream. Due to the severe drought conditions at the Site and in the Southwest in general over the past several years, contaminant transport from the sources at the Site has not proceeded at a rapid rate until recently. In the late winter of 1996, heavy rain fell at the Site causing acidic drainage and mechanical transport of tailings and sediment. One rainfall event was in excess of eight inches in 24 hours--over one half of the annual average rainfall of 15 inches for the area. As the result of this rainfall, in May and June 1997, pools of acidic water collected in the tributary to Little Walnut Creek. These pools had pH readings between 1.5 and 2.5 units. (See Attachment 3.)

Currently, there is an active discharge of hazardous substances occurring, due primarily to the heavy rains that have fallen at the Site. On-site springs are flowing through the tailings causing smaller active discharges to the tributary to Little Walnut Creek. Based on climatological data, actual or potential discharges from the Site have the highest probability of occurring during the summer in conjunction with the tropical monsoonal flow originating on Mexico's Pacific Ocean coast. Therefore, unless the Site is addressed, it is expected that high discharge of hazardous substances (e.g., arsenic, beryllium, cadmium, lead, or zinc) will continue for the next several months.

As previously stated, the contaminants of concern at the Site are arsenic, beryllium, cadmium, lead, and zinc. The health effects of each of these contaminants as listed in available literature are as follows:

a. Arsenic - Arsenic is a naturally-occurring element which is usually found combined with one of more elements such as oxygen, chlorine or sulfur. This element is widely distributed in the environment from natural sources, but higher concentrations have been found to occur in association with chemical waste, smelting of copper and other metals, fossil fuel combustion, and pesticide use. Since ancient times, arsenic has been recognized as a human poison. Large oral doses may be fatal. Chronic arsenic overexposure may cause many adverse health effects, including body weight changes, changes in blood chemistry, and liver and kidney damage. The critical or most sensitive effects, based on chronic oral exposure to humans include darkening of the skin, formation of skin bumps, and blood circulation complications.

Arsenic is considered a Group A human carcinogen based on experimental and epidemiological data on humans and animal. A Class A human carcinogen is in the highest weight-of-evidence classification used in the EPA classification system for carcinogenicity which means that there is sufficient human evidence to show that this element is a carcinogen. Epidemiologic studies and case reports have found evidence that arsenic exposure is associated with increased risk of cancer of the skin, lungs, bladder, and kidneys. Arsenic causes carcinogenic effects when exposure occurs through either the ingestion or inhalation pathways.

b. Beryllium - Beryllium is a hard gray metal which occurs as a chemical component of certain rocks. It is mined for use in metal and alloys. Short-term exposure through inhalation can produce lung inflammation and pneumonia-like symptoms. Long-term exposure through inhalation can cause berylliosis, an immune reaction characterized by non-cancerous growths on the lungs. Similar growths can appear on the skin of sensitive individuals exposed through dermal contact.

Beryllium has been classified as a Class B2 - Probable Human Carcinogen. When a material is a Class B2 Probable Human Carcinogen, it means that there is limited human data indicating that the material is a probable human carcinogen. When a material is a Class B2 Probable Human Carcinogen it means that there is

sufficient evidence in animal studies to indicate that the material is a carcinogen in animals.

Epidemiological studies have shown that an increased risk of lung cancer may result from overexposure to beryllium in industrial settings. In addition laboratory studies have shown that breathing beryllium causes lung cancer in animals. The cancer risk from ingestion of beryllium is unclear.

c. Lead - Lead is a ubiquitous element, found in water, air, and food. Children are the most sensitive population for lead exposures with critical effects seen in the nervous system. Peripheral neuropathy or chronic nephropathy may be seen in adults exposed occupationally while the critical effect for the general population is hypertension. Absorption of ingested lead is the most significant route of uptake of lead in humans. Uptake of lead in humans can also result from ingestion of lead contaminated food, water, soil, or dust. Chronic exposure to lead can deleteriously affect the blood system, the nervous system and the kidneys in humans. Developing children are especially sensitive to lead-induced nervous system injury in the form of lead encephalopathy. Symptoms include, lethargy, vomiting, irritability, loss of appetite, dizziness, epileptic convulsions, delirium, hallucination, and cerebral edema. Lead induced nervous system damage in children has been shown to decrease cognitive abilities by as much as five IQ points. See Centers for Disease Control statement "Preventing Lead Poisoning in Young Children" (October 1991).

Lead has also been classified as a Class B2 - Probable Human Carcinogen. When a material is a Class B2 Probable Human Carcinogen, it means that there is limited human data indicating that the material is a probable human carcinogen. When a material is a Class B2 Probable Human Carcinogen it means that there is sufficient evidence in animal studies to indicate that the material is a carcinogen in animals.

Lead has also been shown to have detrimental reproductive effects in women, and can be transferred to the fetus through the placenta. Prenatally lead-exposed infants have shorter gestation periods, lower birth weights, reduced mental development, and growth deficits.

d. Cadmium - Cadmium can cause a number of adverse human health effects. Ingestion of high levels of cadmium (e.g. 10 mg) can cause severe irritation of the gastrointestinal tract, leading to vomiting and diarrhea; inhalation of high levels (e.g. 1 mg/M³) may lead to severe irritation of the lungs. Such high exposures however, are rare in environmental settings and are usually reported following occupational or accidental exposures. Another area of concern is the effects which may occur following long-term, low level exposure. Kidney damage such as stone formation has been observed in people who are exposed to excess cadmium either through air (inhalation) or the diet (ingestion). It can also lead to effects on the skeleton that are painful and debilitating. Lung damage, such as emphysema, has been observed in workers chronically exposed in factories where levels of cadmium in the air were high. Lung cancer has been observed in animals exposed for long periods of time to cadmium in air. Studies in humans also suggest that long-term inhalation of cadmium can result in an increased risk of lung cancer.

e. Zinc - In humans, zinc ions are poorly absorbed, but salts of strong mineral acids are corrosive to skin and gastrointestinal tract. Ingestion of 2 grams or more of zinc produces toxic symptoms in humans. Zinc sulfate (an emetic drug) in these amounts irritates the gastrointestinal tract and causes vomiting. Symptoms from acute poisoning including fever, nausea, vomiting, stomach cramps, and diarrhea develop 3 to 12 hours after ingestion. However, evidence of hematologic, hepatic, or renal toxicity has not been observed in individuals ingesting as much as 12 grams of elemental zinc over a two-day period.

The toxicological information for the other site-related contaminants can be seen in the Draft Baseline Human Health Risk Assessment (this "draft" has been used as a final document by EPA for risk assessment at the Site) included as part of the RI Report.

5. NPL status

The Site was included on the National Priorities List (NPL) on March 31, 1989, 54 Fed. Reg. 13296. Remedial activities are in progress and will continue after the Removal Action is completed. Because this Removal Action constitutes a source control action, it will be consistent with any subsequent remedial action. See Sections II.B.1 and II.B.2 of this Action Memorandum for descriptions of past and future remedial actions for the Site.

The Agency for Toxic Substances and Disease Registry (ATSDR) prepared a preliminary Health Risk Assessment for the Site in May of 1990. Based on Hazard Ranking System (HRS) data and a site visit, ATSDR concluded that the Site was of concern because of the potential risk to human health resulting from possible exposure to hazardous substances.

6. Maps, pictures and other graphic presentations

- Attachment 1 - Site Location Map
- Attachment 2 - Cleveland Mill Area Map
- Attachment 3 - June 1997 Site Inspection Report
- Attachment 4 - Responsiveness Summary
- Attachment 5 - Enforcement Attachment (confidential)

B. Other Actions to Date

1. Previous actions

The RI and the Feasibility Study (FS) for the Site were completed in 1993. The September 1993 ROD, issued by EPA, calls for excavation of the contaminated tailings and sediment, off-site reprocessing (*i.e.*, milling or remilling) of the contaminated tailings and sediment, off-site disposal of any residuals that have concentrations of contaminants above acceptable levels, beneficial reuse of any metals recovered, and on-site ground water monitoring.

The PRPs agreed to perform the remedial action identified in the ROD and to pay EPAs related costs pursuant to the Consent Decree. In 1996, it became apparent that no acceptable mill could be found to reprocess the contaminated tailings and sediment from the Site. Accordingly, the PRPs, and EPA in coordination with NMED undertook an approximately year-long search for alternative disposal areas and acceptable disposal designs for those areas. However, no acceptable, cost-effective alternative disposal area and method were found. Meanwhile, conditions at the Site worsened. Specifically, the rate of migration of arsenic-, beryllium-, cadmium-, lead- and zinc-contaminated tailings and sediment unexpectedly increased due to an early season of unusually heavy rains, causing contamination to spread much faster, and increasing the risk to human health and the environment.

Technical activities at the Site since issuance of the ROD have included the installation of three sediment retention structures in the tributary to Little Walnut Creek in an attempt to slow the spread of the tailings. The magnitude of the recent rains at the Site was such that these structures were not able to contain the volume of tailings and sediment, and debris that was washed from the Site.

In summary, the search for an acceptable off-site disposal alternative under the ROD was ultimately unsuccessful, and, during the search, unanticipated weather events caused extensive contaminant migration at the Site thereby increasing the risk to human health and the environment and making that risk more immediate; consequently, expeditious action must now be taken on-site to address the surficial contamination.

Community relations activities have been conducted at the site in support of the remedial action since 1991. The public participation requirements of CERCLA, Subsection 113(k)(2)(B)(i-v) and Section 117, 42 U.S.C. Subsection 9613(k)(2)(B)(i-v) and Section 9617, were met during the remedy selection process culminating in an April 27, 1993, public meeting in Silver City to announce proposed response action alternatives and to solicit public comment. Since that time, EPA has kept the public informed of progress at the Site through periodic public open house meetings and visits with local public officials.

On June 3, 1997, EPA held a public open house meeting to discuss the proposed Removal Action. Public reaction to the announcement was overwhelmingly positive. The response to the comment letters received is included as Attachment 4.

2. Current Actions

In June 1997, the PRPs, with oversight by EPA and NMED, began preparatory work at the Site in support of a Removal Action. This work included performing archaeological assessments and drilling borings to determine the best areas for disposal cell placement.

6. State and Local Authorities' Roles

1. State and local actions to date

The State of New Mexico, through NMED, has been significantly involved in the previous activities conducted at the Site. Previous State activities have been summarized in Section II.B.1. above.

NMED, the New Mexico Historic Preservation Division (NMHPD), and the New Mexico Natural Resource Trustee (NM NRT) are currently providing review, comment, and consultation on design documents being prepared by the PRPs.

2. Potential for continued State/local response

NMED, NMHPD, and NM NRT will continue to provide support for activities conducted at the Site. At this time, EPA has not requested that NMED fund a portion of the response action because the PRPs are expected to perform the Removal Action.

III. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT

Threats to Public Health and Welfare

The conditions present at the facility constitute a threat to public health or welfare or the environment based upon the factors set forth in Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan, as amended, 40 CFR Part 300, ("NCP"). These factors include, but are not limited to, the following:

- a. actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants -- this factor is present at the Site due to the potential for exposure of human populations as a result of the presence of hazardous substances contained in mining waste that are widely scattered about the Site and due to the fact that the Site is frequently visited by people who use the Site for outdoor recreation. Previous investigations of the Site have revealed the presence of hazardous substances in the tailings and sediment at elevated concentrations that present potential health risks to residents of the area. There is also a potential for risk to the terrestrial and aquatic ecology.
- b. actual or potential contamination of drinking water supplies or sensitive ecosystems -- this factor is present at the Site due to the potential for release of hazardous substances into the Colorado Formation and overlying alluvium which constitute the primary drinking water aquifer in the Little Walnut Creek valley. Previous investigations have shown concentrations of some Site-related parameters such as sulfate, calcium and zinc in two residential wells above background concentrations. This suggests that leachate from the Site has affected the drinking water aquifer. The mechanism for this transport is via infiltration of Site-contaminated surface water from Little Walnut Creek which flows across the Colorado Formation and alluvial aquifers that are used for drinking water. Site surface water is impacted by acidic run-off from the tailings and sediment and seepage from springs underlying the waste piles.
- c. hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release -- this factor is not present at the Site because the bulk storage of waste present at the Site (tailings) is not