Appendix 2

1997 EPA Action Memorandum

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
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000745

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
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TO: Myron O. Knudson, P.E., Director
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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 #: NMD981155930
Category of Removal: Time 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 ½ 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 ½ 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 Gila 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 MRRC 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	
					Chemical Specific RME Risk (a)	
Medium	Chemical	Remediation Level (ppm)	Point of Compliance	Basis of Goal	Cancer Risk	Non-Cancer Hazard Index
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/M^3) 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.

C. 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

A. 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

in containers. However, because the waste at the Site is not contained, it poses a greater threat than contained waste.

d. high levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate -- this factor is present at the Site due to the existence of elevated levels of the hazardous substances in tailings and sediment which were deposited on the surface of the Site in numerous locations during mining and milling operations. These tailings and sediment may migrate as airborne particles carried by wind, or they may be transported in rainwater runoff. The tailings and sediment at the Site are likely to be incidentally ingested or inhaled by humans who use the Site for recreation. The hazardous substances contained in the area soils may cause varying degrees of health-related problems relative to exposure as indicated in Section II.A.4.

e. weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released - this factor is present at the Site due to the further dispersal of the tailings and sediment about the Site by various means, including but not limited to wind, surface water, and the erosional effects of rain, snow, and ice. Additionally, flooding of Little Walnut Creek may result in deposition of hazardous substances on surface soils along drainage pathways.

f. threat of fire or explosion - this factor is not present at the Site since there are no fire or explosion hazards associated with hazardous substances that are being addressed through this response action.

g. the availability of other appropriate federal or state response mechanisms to respond to the release - there are no other mechanisms available to respond to this release in a timely manner so as to effectively address the imminent and substantial endangerment to human health posed by the hazardous substances located on the Site. The State and local officials do not have the resources available to address the current situation. If other mechanisms become available during the conduct of this response action, the EPA will evaluate that mechanism, as appropriate.

h. other situations or factors that may pose threats to public health or welfare or the environment - heavy recreational use of the Site and surrounding area by adults and children cause nearby residents to be

exposed to tailings and sediment. Children play in tailings in some of the Site areas and teenagers congregate at the Site reservoir. Children may ingest, inhale, or come into dermal contact with hazardous substances during play at the Site. The tailings are located in the streambed on residential property and they are migrating downstream in the creek toward more densely populated areas.

B. Threats to the Environment

The proposed action to be taken during this response is designed to address a public health threat resulting from historical mining and milling operations. Although not specifically designed to do so, this Removal Action will incidently reduce or mitigate potential ecological threats because it is a source control action. The long-term remedial action envisioned for this Site will address any potential ecological threats associated with the Site.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances, pollutants or contaminants from the Site, if not addressed by implementing the response action selected in this Action Memorandum, will continue to present an imminent and substantial endangerment to public health, or welfare, or the environment.

The endangerment determination in the preceding paragraph is based on circumstances at the Site as described in this Action Memorandum, and in the administrative record for this Removal Action. The administrative record for this Removal Action includes, without limitation, the September 22, 1993, ROD, and the administrative record for the ROD. The administrative record for the ROD includes, without limitation, the Remedial Investigation (RI) Report for the Cleveland Mill Superfund Site (March 23, 1993) and the baseline risk assessment which is a part of that report. The risks to human health and the environment posed by the contamination at the Site are specifically described and summarized in Section VI (Summary of Site Risks) of the September 22, 1993 ROD, and Section VI of the ROD is hereby incorporated into this Action Memorandum.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The Removal Action is a source control action which will address the tailings and sediment on the Site by consolidation, disposal in an on-site cell, capping, and revegetation.

The tailings and sediment with contaminant concentrations above the remedial action goals will be excavated and disposed of in an on-site disposal area located away from significant natural drainage areas. The disposal area will be covered with a cap which will be designed and constructed in a manner which promotes drainage around the disposal cell, minimizes erosion, and which permanently minimizes migration of liquids through the underlying tailings, sediment, and soil. The cap will be a multi-layered cap which will include without limitation at least one impermeable (less than 10^{-8} cm/sec permeability), synthetic layer. The bottom of the disposal area will be at least 25 feet above the seasonal high ground water table. All areas affected by the Removal Action will be revegetated (including the top layer of the cap) except for those areas that have been excavated to bedrock and those areas which will be used as a part of the Site drainage (e.g. areas covered with rip rap to aid in drainage).

It is expected that the bulk of the tailings and sediment will be excavated from the streambed during this Removal Action. Small amounts of tailings and sediment (probably less than 1000 cubic yards) may still remain after the Removal Action. During rainfall events, this small amount of remaining tailings and sediment will passively collect in the sediment retention structures which the PRPs have constructed in the tributary to Walnut Creek. The collection of this small amount of tailings and sediment and the excavation of the sediment retention structures will be a part of the long-term remedial action at the Site. Post-removal site control will be managed as part of the remedial action for the Site.

In order to ensure that the remedial action goals are met, a series of confirmation samples will be taken at the bottom of the pit or scrape created at each area where tailings and sediment have been excavated on the Site, unless excavation to bedrock has occurred. At least ten percent of the samples taken at each excavation site will be analyzed for metals which are hazardous substances other than arsenic, beryllium, cadmium, lead, and zinc, in addition to being analyzed for these metals.

The sampling and analytical activities to be conducted during this removal action will be defined in the Quality Assurance Project Plan and the Sampling and Analysis Plan designed for this project.

In order to ensure both general public and worker health and safety, a Health and Safety Plan will be developed which identifies the health and safety activities which will be implemented.

Institutional controls such as deed notices, public education, or zoning restrictions (subject to the cooperation of local officials) may be used or encouraged as part of the removal action because the disposal area will be located on-site. That is, in order for this removal action to remain protective, cap integrity must be maintained. The dissemination of information to the public via deed notices, zoning restrictions, and education should help prevent actions which could harm the cap. Institutional controls, as well as ground water and surface water monitoring, and O&M are a part of the remedial action which will follow this Removal Action.

No further information is needed before the response action can be completed. At this time, off-site disposal is not anticipated, because the contaminated tailings and sediment will be contained on-site.

2. Contribution to remedial performance

Because the proposed Removal Action is a source control action, it is consistent with long-term remediation strategies. Surface and ground water monitoring and long-term O&M will continue to be addressed through the remedial action described in the ROD and the Consent Decree.

3. Description of alternative technologies

At this time, there are no other proven alternative technologies that could feasibly be applied at the Site. The only action deemed appropriate is to immediately begin the mitigation of the threats posed by the Site in the fashion proposed herein. Alternatives to land disposal were considered in the FS prior to issuance of the ROD, and a reprocessing technology was the selected alternative in the ROD. However, no acceptable, cost-effective off-site alternative is feasible for the Site at this time as detailed in Section II.B.1 of this Action Memorandum.

4. Applicable or Relevant and Appropriate Requirements (ARARS)

The proposed Removal Action will be conducted to eliminate the actual or potential exposure to hazardous substances, pollutants or contaminants pursuant to the CERCLA, 42 U.S.C. § 9601 et seq., in a manner consistent with the National Contingency Plan, 40 CFR Part 300, as required at 33 U.S.C. § 1321(c)(2) and 42 U.S.C. § 9605. The proposed Removal Action under CERCLA § 106 shall, to the extent practicable considering the exigencies of the situation, attain the Applicable or Relevant and Appropriate Requirements (ARARs) under Federal environmental law.

Due to the fact that the abatement of an actual or potential discharge of metal-contaminated leachate from the Site into Little Walnut Creek and downstream aquifers is one of the principal elements of this Removal Action, the following water quality standards are relevant and appropriate: provisions of the Clean Water Act, 33 U.S.C. §1251 et seq.; the Safe Drinking Water Act, 33 U.S.C. §300 f et seq.; the New Mexico Water Quality Act, NM Stat. Ann. §74-6-1 et seq.; NM WQCC Regulations, 20 NMAC 6.2, Sections 2101, 2201, 3101, 3103, 4101, and 4103.A (concerning the impacts of vadose zone contaminants to ground water); and NM WQCC Regulations 20 NMAC 6.1, Sections 1102, 2803, and 3101.

Other requirements that are relevant and appropriate to this Removal Action are: the Section 106 process of the National Historic Preservation Act of 1966, 16 U.S.C. §§ 470-470W-6 et seq., and further codified at 36 C.F.R. Part 800, regarding historical preservation, the Archaeological and Historic Properties Act; and the Endangered Species Act, 16 U.S.C. §1531 et seq., and the New Mexico Wildlife Conservation Act. The New Mexico Solid Waste Management regulations (EID/SWMR-3, Section 302) protecting fault areas, shall also be considered in implementing the Removal Action. In addition, the Site reclamation and revegetation shall be performed consistent with the New Mexico Mining Act (NMMA) of June 18, 1993, (NMMA 69-36-11.B.3.).

State ARARs were received in a timely manner for inclusion in this Removal Action. The proposed response will attain State ARARs.

Air monitoring will be conducted during removal activities to protect the residents and the on-site workers from inhalation of airborne emissions. Appropriate dust suppression procedures and equipment will be in place and operational throughout the duration of the Removal Action. Air monitoring will be conducted as per 40 C.F.R. 300.415(j).

Although not ARARs, requirements of the Occupational Safety and Health Act (OSHA) of 1970, 29 U.S.C. § 651 et seq, and under the laws of the State, approved under Section 18 of the OSHA, as well as other applicable safety and health requirements, will be followed during the conduct of the action. Federal OSHA requirements included Hazardous Materials Operation, 20 CFR Part 1910, as amended by 54 Fed. Reg. 9317 (March 1989), all OSHA General Industry (29 CFR Part 1910) and Construction (29 CFR Part 1926) standards wherever they are relevant, as well as OSHA record-keeping and reporting regulations, and the EPA regulations set forth in 40 CFR Part 300, relating to the conduct of work at Superfund sites.

5. Project schedule

The proposed actions are expected to be initiated in a maximum of 60 days from approval of this Action Memorandum. It is anticipated the removal of the tailings and sediment from all areas except the lower streambed will take approximately 180 days. Because the removal of the material from the lower streambed will be a passive process, it will be conducted under the remedial action portion of the Site activities.

B. Estimated Costs

EPA expects that the PRPs will conduct this Removal Action.

VIII. EXPECTED CHANGE IN THE SITUATION SHOULD NO ACTION BE TAKEN OR ACTION BE DELAYED

Should the actions described in this Action Memorandum be delayed or not taken, the metal-contaminated (i.e., hazardous substance-contaminated) tailings and sediment on the Site will continue to spread to other areas and will continue to pose a significant potential risk to the general public health and the environment.

IX. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues associated with this Removal Action.

X. ENFORCEMENT

The enforcement strategy is discussed in the Enforcement Sensitive Enforcement Addendum which is Attachment 5 to this Action Memorandum. The responsible parties at the Site are already participating in the remedial action at the Site under a Consent Decree. They have expressed willingness to enter into an agreement to conduct the Removal Action and negotiations are underway.

XI. RECOMMENDATION

This decision document represents the selected Removal Action for the Cleveland Mill Superfund Site in Grant County, New Mexico, developed in accordance with CERCLA, as amended, and is not inconsistent with the National Contingency Plan (NCP), 40 CFR Part 300. This decision is based on the Administrative Record for the Site.

Conditions at the Site meet the NCP Section 300.415(b)(2), 40 CFR § 300.415(b)(2), criteria for a removal and I recommend your approval of the proposed Removal Action. The responsible parties are expected to pay for this action so no funds will be required from the Regional Allowance.

APPROVED: _____ **DATE:** 7/11/97

Attachments

ATTACHMENT 1

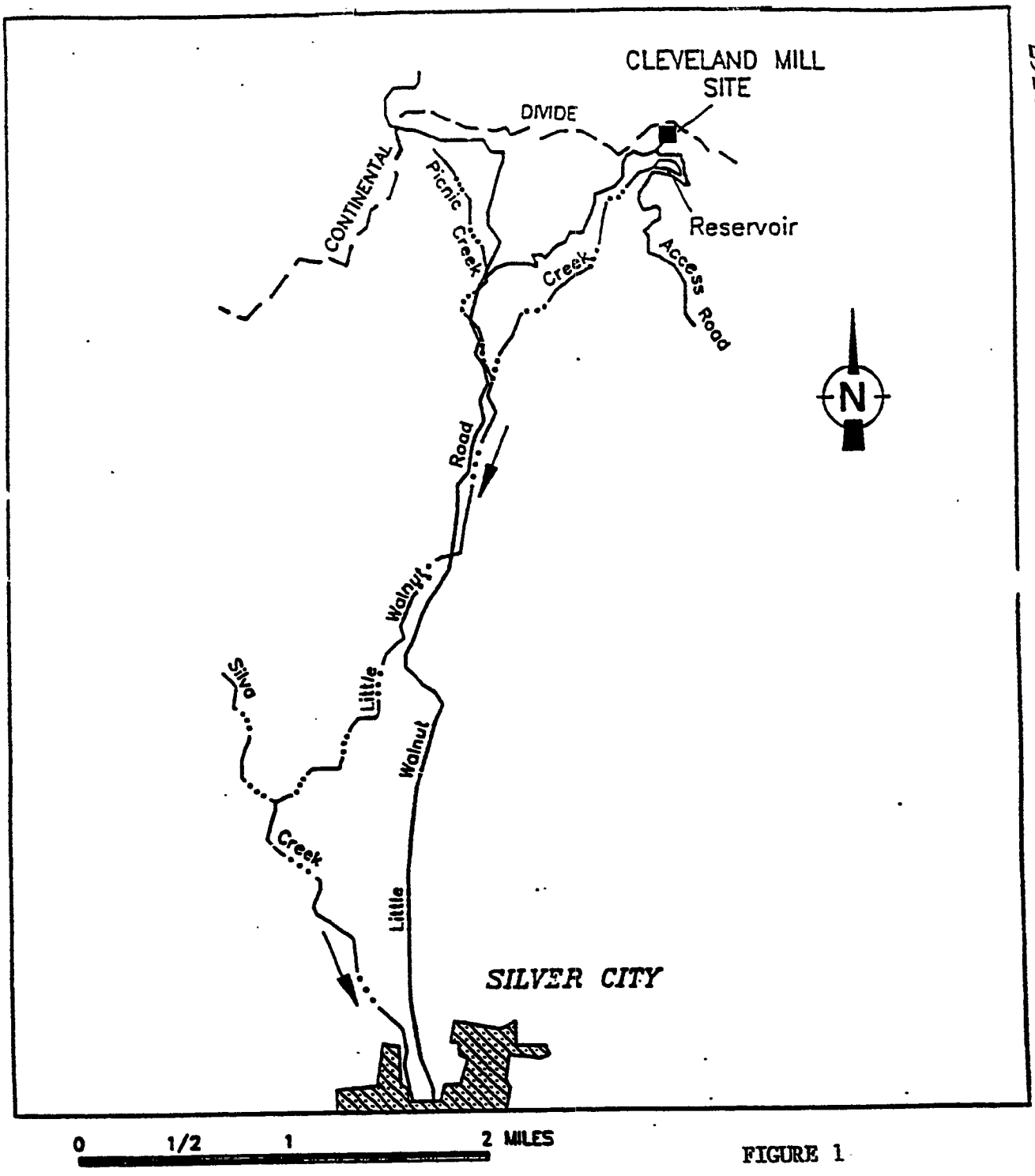
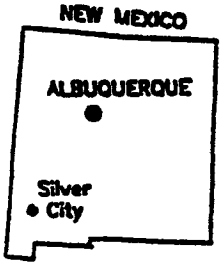


FIGURE 1

LOCATION MAP



LEGEND

Site location

CLEVELAND MILL SUPERFUND SITE
Grant County, New Mexico

TITLE:

SITE LOCATION MAP

Project No. EN3017

ecology & environment, inc.
ALBUQUERQUE, NEW MEXICO

ATTACHMENT 2

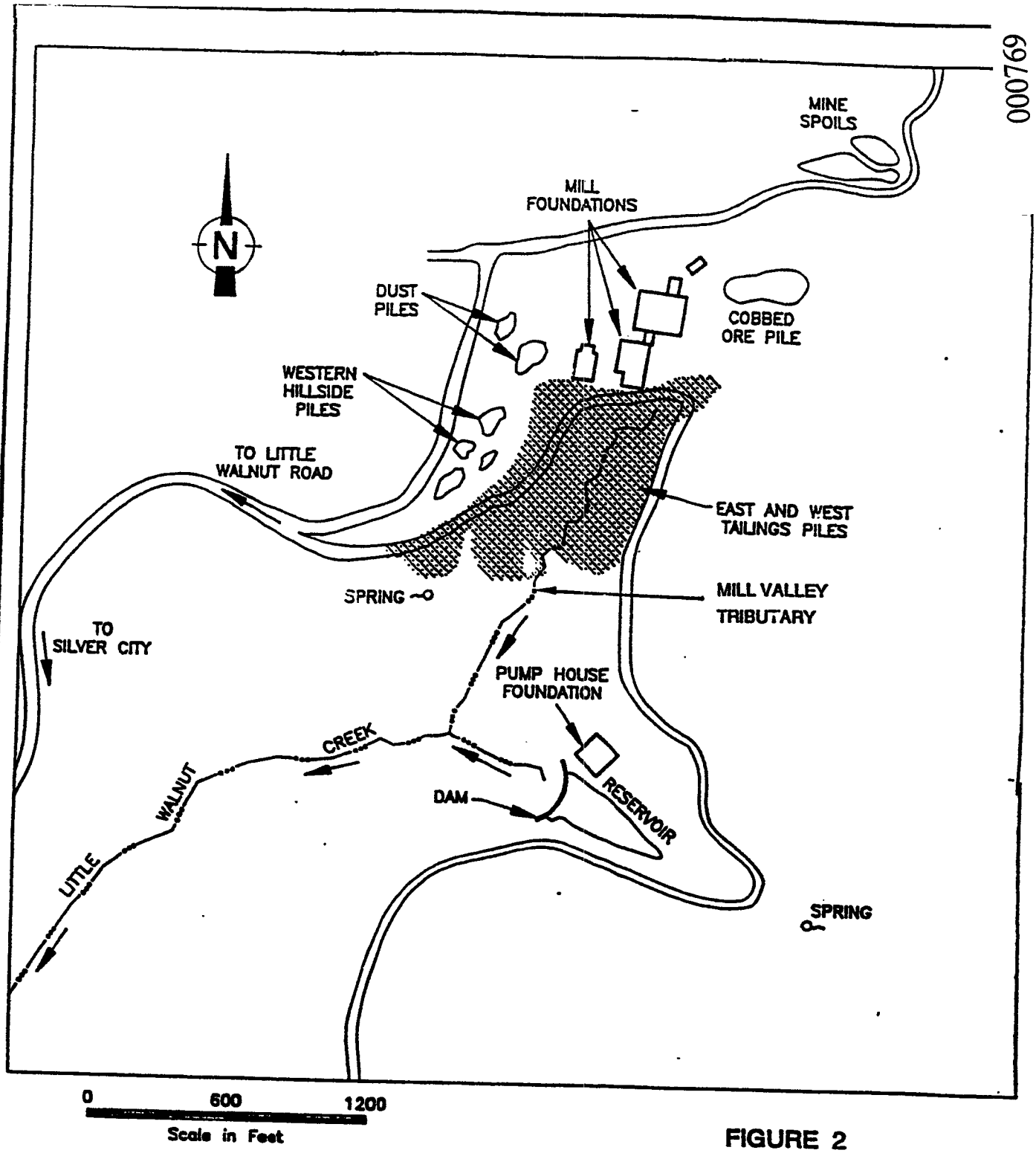


FIGURE 2

CLEVELAND MILL SUPERFUND SITE
Grant County, New Mexico

TITLE:

MILL AREA MAP

Project No. EN3017

ecology & environment, inc.
ALBUQUERQUE, NEW MEXICO

Date 10/92 By PSM 1"=600'

Source: Modified from Site Screening Report (EPA 1990)

ATTACHMENT 3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

000771

JUN 30 1997

MEMORANDUM

SUBJECT: Site Inspection Report on Recent Conditions at the Cleveland Mill Superfund Site, Grant County, New Mexico

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

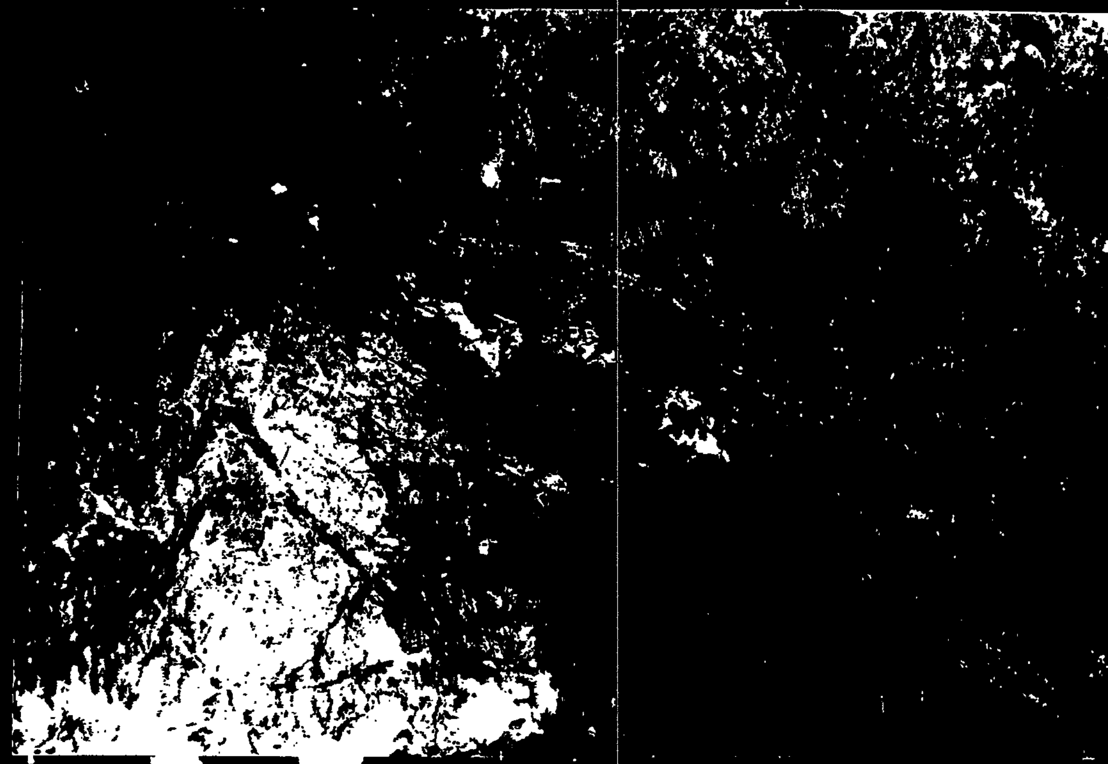
TO: Cleveland Mill Superfund Site File
NMD981155930

The purpose of this memorandum is to document site conditions during my recent visits to the Cleveland Mill Superfund Site. I visited the site on April 29-30, 1997, June 3, 1997, and June 10-11, 1997. During each of these visits, I walked from the base of the tailings, downstream along the tributary to Little Walnut Creek which originates at the mill foundations. During each visit, I observed six to ten pools of red acidic leachate from the tailings in locations up to 2000 feet from the site. The pH of these pools ranged from 1.5 units to 2.5 units.

Ordinarily, the tributary and creek do not have pooled water in them, except immediately after a heavy rain. I had not observed as much red acidic water in the tributary since the early part of 1993 when the area near the site had record rainfall. The pH of the leachate I observed in 1997 was also lower than the pH of the leachate recorded in early 1993 which averaged about 3 units.

The attached photographs were taken on April 12, 1997, by Robert Pelham, a resident who lives near the site. The first photograph shows spring activity near the mill foundations. This spring activity is the result of the heavy rainfall since March 1997. The second two photographs show acidic pools of water about 1000 feet downstream from the mill foundations where a small tributary from the clean site reservoir (the clear water on the left) meets the tributary to Little Walnut Creek originating at the mill foundations.

Attachment



000773

Attachment 4 - Responsiveness Summary

1. Comment: Communication has been excellent, but the action taken at the site has been slow. The work at the site should have been completed years ago instead of dragging it out and wasting the taxpayers money.

Response: The administrative record details the steps that were taken at the Site in order to clean it up. Because of the rapid residential development in the area, an off-site remedy was originally selected for the Site. When the selected off-site remedy became infeasible, other off-site disposal options were investigated. At the same time, conditions at the Site worsened. By May 1997, off-site disposal options were ruled out, and EPA initiated this Action Memorandum.

Taxpayer money was not spent on this site. Through the provisions of the Consent Decree, the potentially responsible parties (PRPs) reimbursed EPA for all past investigation costs (with interest) and agreed to pay for and perform all future work at the Site. In addition, the PRPs have set up a special account to cover EPA oversight costs during clean-up activities at the Site. NMED oversight costs will also be reimbursed by the PRPs.

2) Comment: The commenter feels that it is important to clean-up the Site and thanked EPA for doing something in the Silver City area.

Response: Comment noted. As stated above, the PRPs have been responsive in this situation and have been paying for the clean-up.

3) Comment: Little investigation has been done on the drainage of the mine spoils pile. The commenter has a water well downstream of this pile.

Response: The mine spoils pile and the drainage were investigated during the Remedial Investigation, but no wells were sampled. The well of this commenter, however, was sampled during the baseline ground water sampling performed by the PRPs the week of June 9, 1997. Ground water monitoring is included in the Consent Decree and will be a part of the future remedial action.