

Minnie Mine
FS 426

STATE OF WASHINGTON
DEPARTMENT OF WASHINGTON

In the Matter of Remedial)	Enforcement Order
Action by:)	
)	
UNITED STATES DEPARTMENT OF)	No. DE 94TC-C433
AGRICULTURE FOREST SERVICE)	
MINNIE MINE MILL Facility)	
OKANOGAN COUNTY, WASHINGTON)	
)	
)	

To: Forest Supervisor
 Okanogan National Forest
 United States Department
 Agriculture Forest Service
 1240 South Second
 Post Office Box 950
 Okanogan, Washington 98840

I.

Jurisdiction

This Order is issued pursuant to the authority of RCW
 70.105D.050(1).

II.

Statement of Facts

Based on currently known information, Ecology makes the
 following Statement of Facts:

2.1 The Minnie Mine mill facility, hereinafter referred
 to as the facility, is located in Okanogan County,
 Washington, approximately eight miles south of Twisp,
 Washington. The facility is situated in Leecher Canyon,
 approximately three miles northeast of Carlton, Washington.

As part of the Okanogan National Forest, the facility is owned by the United States Department of Agriculture Forest Service, hereinafter referred to as the Forest Service. Mining claims associated with the facility were staked by Fred Higby, who operated a small cyanide leach plant in 1982. The existing cyanide heap leach operation was operated by the lessees of Mr. Higby's claims, Cordilleran Development, Inc., which ceased mining in 1986.

2.2 Arsenic, mercury, lead, chromium, cadmium, and cyanide were detected in solids or liquids at the facility at levels which may pose a threat to human health and the environment.

2.3 The foregoing information was contained in the following document: United States Department of Agriculture Forest Service, Okanogan National Forest. 1991. "Minnie Mine Action Plan."

2.4 On July 14, 1993, the U.S. Forest Service notified Ecology, in part, of the following: "This morning 3 dead cows found in pit, 1 dead cow on bank...." Cause of death unknown at present.

2.5 Animal deaths occurred in and around the ponds located on the facility hereinafter referred to as "the ponds."

Enforcement Order
U.S. Department of Agriculture
Forest Service Minnie Mine Mill
No. DE 94TC-C433
Page 3

2.6 On July 29, 1993 Ecology issued Emergency Enforcement Order No. DE 93TC-C418 to the USFS. This Order required among other things immediate facility control, the removal of pond fluids, and that a Remedial Investigation/Feasibility Study of the Facility be conducted.

2.7 On November 16, 1993 Ecology issues enforcement Order No. DE 93TC-C528 to the USFS. This Order recognized that the Emergency removal actions required under Order No. DE 93TC-418 had been accomplished and called for the completion of the RI/FS.

2.8 On August 3, the USFS presented to Ecology the final RI/FS documents and a proposed Cleanup Action Plan for the Minnie Mine facility.

III.

DETERMINATIONS

3.1 The Forest Service is an "owner or operator" as defined at RCW 70.105D.020(6) of a "facility" as defined in RCW 70.105D.020(3).

3.2 The facility is known as Minnie Mine mill facility and is located in Section 23, Township 32 North, Range 22 East, Willamette Meridian, approximately 8 miles south of Twisp, Okanogan County, Washington.

3.3 The substances found at the facility as described

above are "hazardous substances" as defined at
RCW 70.105D.020(5).

3.4 Based on the presence of these hazardous substances at the facility and all factors known to the Department, there is a release or threatened release of hazardous substances from the facility, as defined at RCW 70.105D.020(10).

3.5 By letter dated September 11, 1991, Ecology notified the Forest Service of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment.

3.6 Pursuant to RCW 70.105D.030(1) and 70.105D.050, the Department may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

3.7 Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest.

IV.

Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that the Forest Service take the following remedial actions and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein.

4.1 The Forest Service shall implement the cleanup Action and schedule described in attachment A. Attachment A is attached to this Order and is an integral and enforceable part of this Order.

V.

Terms and Conditions of Order

1. Definitions

Unless otherwise specified, the definitions set forth in ch. 70.105D RCW and ch. 173-340 WAC shall control the meanings of the terms used in this Order.

2. Public Notice

RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which

indicate to Ecology that the Order is inadequate or improper in any respect.

3. Remedial Action Costs

The Forest Service shall pay to Ecology costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2).

The Forest Service shall pay the required amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges.

4. Designated Project Coordinators.

The project coordinator for Ecology is:

Name: Rick Roeder

Address: 106 S. 6th Ave

Yakima, WA 90902

Enforcement Order
U.S. Department of Agriculture
Forest Service Minnie Mine Mill
No. DE 94TC-C433
Page 7

The Forest Service shall designate a project coordinator for activities associated with this Order within 15 days of receipt of the Order.

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and The Forest Service, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinator(s). Should Ecology or The Forest Service change project coordinator(s), written notification shall be provided to Ecology or the Forest Service at least ten (10) calendar days prior to the change.

5. Performance.

All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup.

The Forest Service shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the Site. The

Enforcement Order
U.S. Department of Agriculture
Forest Service Minnie Mine Mill
No. DE 94TC-C433
Page 8

Forest Service shall provide a copy of this Order to all agents, contractors and subcontractors retained to perform work required by this Order and shall ensure that all work undertaken by such agents, contractors and subcontractors will be in compliance with this Order.

Except when necessary to abate an emergency situation, the Forest Service shall not perform any remedial actions at the Minnie Mine facility outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

WAC 173-340-400(7)(b)(i) requires that "construction" performed on the Site must be under the supervision of a professional engineer registered in Washington.

6. Access

Ecology or any Ecology authorized representative shall have the authority to enter and freely move about all property at the Site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and

verifying the data submitted to Ecology by the Forest Service.

When entering the Site under ch. 70.105D RCW, Ecology shall provide reasonable notice prior to entering the Site unless an emergency prevents notice. Ecology shall allow split or replicate samples to be taken by the Forest Service during an inspection unless doing so would interfere with Ecology's sampling. The Forest Service replicate samples to be taken by Ecology and shall provide Ecology seven (7) days notice before any sampling activity.

7. Public Participation

The Forest Service shall prepare and/or update a public participation plan for the Site. Ecology shall maintain the responsibility for public participation at the Site.

The Forest Service shall help coordinate and implement public participation for the Site.

8. Retention of Records

The Forest Service shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of

the Forest Service, a record retention requirement meeting the terms of this paragraph shall be required of such contractors and/or agents.

9. Dispute Resolution

The Forest Service may request Ecology to resolve factual or technical disputes which may arise during the implementation of this Order. Such request shall be in writing and directed to the signatory, or his/her successor(s), of this Order. Ecology resolution of the dispute shall be binding and final. The Forest Service is not relieved of any requirement of this Order during the pendency of the dispute and remains responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

10. Reservation of Rights

Ecology reserves all rights to issue additional orders or take any action authorized by law in the event or upon the discovery of a release or threatened release of hazardous substances not addressed by this Order, upon discovery of any factors not known at the time of issuance of this Order, in order to abate an emergency, or under any other circumstances deemed appropriate by Ecology.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting

Enforcement Order
U.S. Department of Agriculture
Forest Service Minnie Mine Mill
No. DE 94TC-C433
Page 11

from the release or threatened release of hazardous substances from the Minnie Mine facility.

In the event Ecology determines that conditions at the Site are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may Order the Forest Service to stop further implementation of this Order for such period of time as needed to abate the danger.

11. Transference of Property

No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by the Forest Service without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest the Forest Service may have in the Site or any portions thereof, the Forest Service shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, the Forest Service shall notify Ecology of the contemplated transfer.

12. Compliance With Other Applicable Laws

All actions carried out by the Forest Service pursuant

to this Order shall be done in accordance with all applicable federal, state, and local requirements.

VI.

Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon the Forest Service's receipt of written notification from Ecology that the Forest Service has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Order have been complied with.

VII.

Enforcement

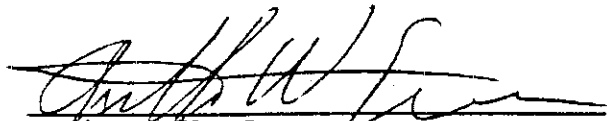
1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:
 - A. The Attorney General may bring an action to enforce this Order in a state or federal court.
 - B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.
 - C. In the event the Forest Service refuses, without sufficient cause, to comply with any term of this Order, the Forest Service will be liable for:

Enforcement Order
U.S. Department of Agriculture
Forest Service Minnie Mine Mill
No. DE 94TC-C433
Page 13

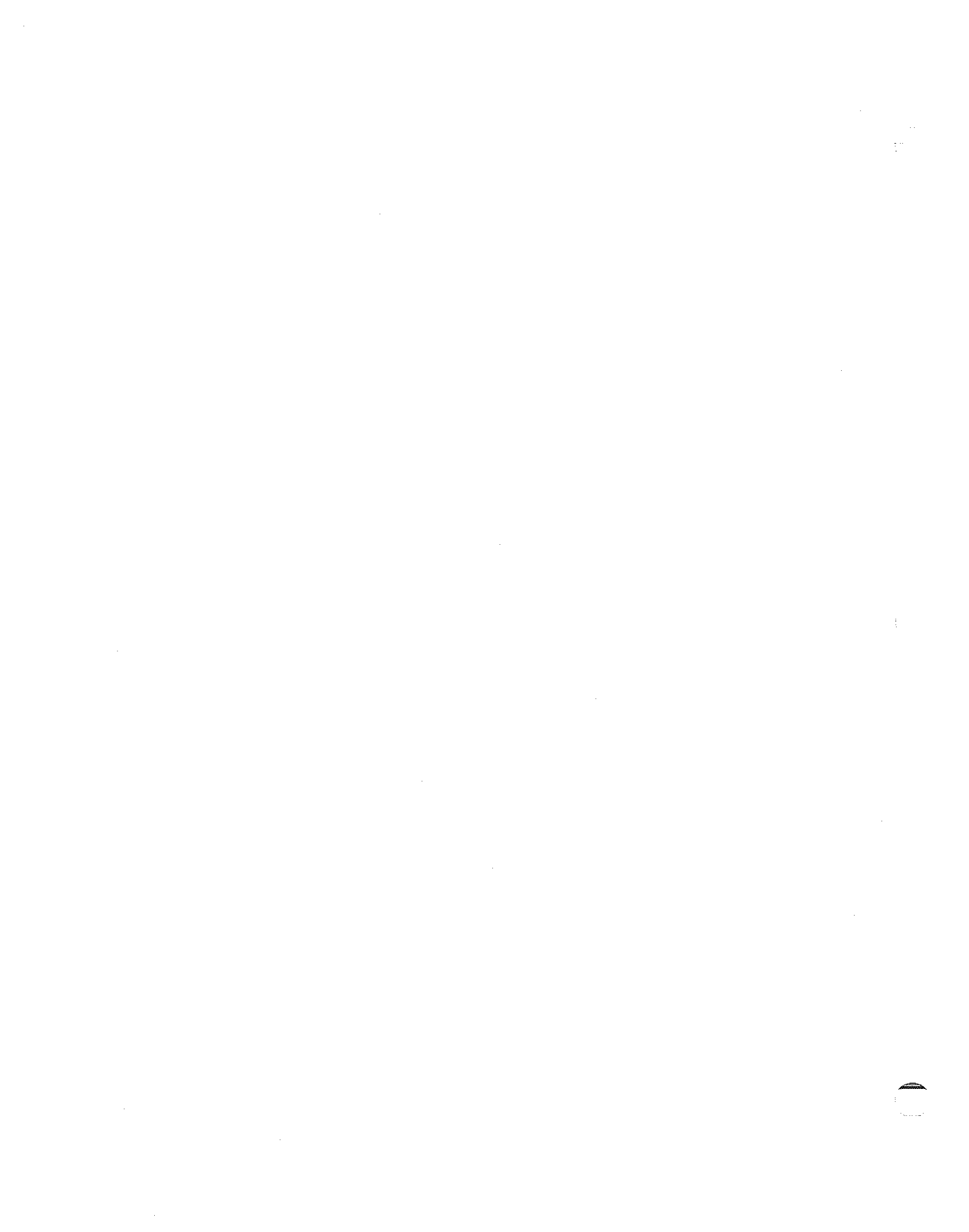
- (1) up to three times the amount of any costs incurred by the state of Washington as a result of its refusal to comply; and
- (2) civil penalties of up to \$25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under RCW 70.105D.060.

Effective date of this Order: OCT 03 1994.


Anthony W. Grover
Section Manager
Toxics Cleanup Program
Central Regional Office

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ATTACHMENT

'A'

Cleanup Action Plan

CLEANUP ACTION PLAN

1. Overview of Proposed Cleanup Action Plan (CAP)

The CAP will consist of capping arsenic-impacted areas of the site with 1.5 feet of clean native soils. The soils will be loosely packed and vegetated with shallow rooting native grasses and designed to encourage natural evapotranspiration of rainwater on the site.

Soils beneath the capped/impacted areas will be monitored for the presence of infiltrating rainwater in soil pores. If soil pore water is found, the soil pore water will be evaluated for arsenic levels. If unacceptable quantities of soil pore water with arsenic are found, the CAP will be reopened for further remedial action.

For the indefinite future, the USFS will inspect and maintain the soil cap to mitigate the effects of erosion, deep rooting vegetation, or other means which would jeopardize the safety the soil cap offers.

2. Summary of Other Remedial Alternatives Evaluated

This CAP was selected in accordance with Model Toxic Control Act (MTCA) regulations after comparisons with other potential remedial alternatives to include recycling, reuse, treatment, and other off-site disposal. Specific alternatives evaluated for the site include:

No action;

On-site soil washing and/or stabilization;

Off-site reuse through smelting; and

Off-site disposal.

On-site soil washing and/or stabilization for this site were evaluated in general in the Phase I RI. The remaining alternatives were evaluated in detail in this Phase II RI/FS. Copies of the Phase I and Phase II Reports are available at Ecology Offices, 106 S. 6th Ave, Yakima, WA, 98902

3. Cleanup Levels and Points of Compliance

The RI performed on the site identified that soil is the primary media and arsenic the primary hazardous substance of concern remaining on the site. Because of arsenic's sole predominance, it is selected as an effective cleanup target compound.

The following soil cleanup levels and points of compliance will be complied with at the site during the CAP:

Cleanup Level

Point of Compliance

20 ppm arsenic in soil

1.5 feet of loose native site soil
over arsenic-impacted areas

In addition to this soil cleanup level, a soil pore water action level is established for the site. This action level is further discussed in the compliance monitoring section of the clean action plan (see page 5). The Point of Evaluation for the soil pore water action level is 6 feet beneath the Arsenic impacted soils.

4. Implementation Schedule for CAP

The CAP will be implemented according to the following schedule.

- 4.1. Submission of CAP engineering reports outlined in Section 6.0 by November 8, 1994.
- 4.2. Mobilization to site no later than November 14, 1994, 1994.
- 4.3. Capping of site completed by November 23, 1994. (weather permitting)
- 4.4. Beginning the monitoring program by November 23, 1994.

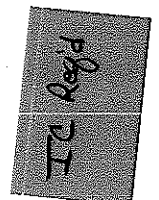
5. Institutional Controls

The following institutional controls are planned for the site.

- 5.1. Site access will be limited. There will be no livestock grazing at the facility.
- 5.2. A vegetation and cap monitoring and maintenance program will be implemented.
- 5.3. Site hydrologic control structures (e.g., the berm) will be inspected regularly.

6. Use of Permanent Solutions to the Maximum Extent Possible

This cleanup action uses permanent solutions to the greatest degree possible in accordance with MTCA WAC 173-340-360(5).



The RI/FS conducted for this site determined that alternative, higher ranked remedial alternatives did not offer increases in protection proportional to the increases in costs. Summarizing the RI/FS, the following conclusions regarding permanence were Reached.

- Capping provides adequate overall protection of human health and the environment.
- Capping and it's associated monitoring and maintenance program offers reliable, long term effectiveness.
- Capping, which disturbs minimal amounts of soil, has a high degree of short-term effectiveness.
- Capping can be readily implemented in the site's remote location and restricted access.
- Capping will control the site's ability to be a future source of releases.
- The costs of alternatives to capping are disproportionate to the increased protection offered by other alternatives.
- Capping will meet community concerns about protecting human health and environment, but at a reasonable, responsible cost.

7. Applicable Laws and Regulations

The capping process will be completed in accordance with applicable laws and regulations identified in the Feasibility Study . At a minimum, these will include:

Washington State Model Toxics Control Act;

Federal and state air regulations;

State ground water and surface water regulations, including storm water pollution prevention; and

Federal and state worker health and safety regulations.

8. Compliance with MTCA WAC 173-340-360 2 & 3

The Phase II FS and this CAP demonstrate that the proposed cleanup action plan meets threshold requirements, permanence standards, reasonable restoration time, and public concerns outlined in MTCA.

9. Description of Materials Remaining On-site

The areas and volumes of soils to be capped will include:

Unprocessed ore heap containing <1,000 cubic yards soil with arsenic from 0-1,000 ppm;

Land Application area 1 containing <1,500 cubic yards soil with arsenic from 0-300 ppm; and

Historically capped processed ore heap containing <4,000 cubic yards soil with arsenic from 0-1,000 ppm.

10. Capping Method

Based on the Suitability Investigation for capping, the site will be capped with a loose soil cover. Due to the low rainfall in the area, this type of soil cap was demonstrated by the HELP model to provide approximately equal performance as other soil cap designs because evapotranspiration is the primary mechanism for reducing infiltration at the site.

The method of capping will also be such that minimum volumes of soils are disturbed to minimize short-term risks. Capping soils will come from an on-site location where arsenic is known to be beneath the site cleanup level. The capping method will include:

- The unprocessed ore heap will be moved to the site's former pond depressions and capped;
- Land application area 1 will be capped with soil in its current configuration;
- At USFS discretion, they may elect to sample and test the present soil cap on the processed ore heap to demonstrate its compliance with cleanup levels in the CAP, or alternatively cap the area with an additional 1.5 feet of site soils. Any sampling shall be of significant number to allow a true representation of existing cap conditions.
- The cap slope shall be smooth and less than 10% grade.
- The cap will be left uncompacted to encourage natural evaporation and vegetative rooting. After installation, the cap shall be tilled to remove superficial compaction caused by heavy equipment.
- The cap shall be protected from surface on-flows by diversion dikes.

- The cap shall be revegetated to match surrounding areas.
- During capping of the site, the USFS will install suction lysimeters and gypsum blocks in three locations beneath the combined processed and unprocessed ore areas. The blocks will be centrally located and placed six feet beneath the lowest portion of the arsenic-impacted soils. The USFS will also install one suction lysimeter and gypsum block upgradient of the area in a non-arsenic impacted area.
- Lime will be applied and tilled into the cap soils to raise the pH of the soils of the land Application and unprocessed ore areas. Appropriate quantities and application methods will be proposed by the USFS as part of the engineering documentation.

11. COMPLIANCE MONITORING FOR PROPOSED CAP

The proposed CAP would include long-term monitoring to ensure that the integrity of the soil cap was maintained and monitoring of potential long-term impacts of hazardous material left on-site.

The monitoring program would include the following elements.

- The cap would be monitored by USFS personnel to ensure that natural processes, such as erosion, do not impact its effectiveness. The cap topsoil layer is to be covered with native grasses. Deep-rooting vegetation would be eliminated annually to maintain the barrier properties of the cap. USFS personnel would also monitor the nearby diversion ditches and dikes system on a regular basis to evaluate their integrity; repairs would be made as necessary to minimize potential flooding of the cap.
- Monitoring of the soil moisture sensors for water and arsenic levels would be performed quarterly for a period of five years. At two years, there will be a review of the site monitoring data. If the data indicate little potential for ground water contamination, then the USFS may seek Ecology approval to reduce monitoring to annually. If after five years of monitoring the data indicate minimal potential for groundwater contamination, then the USFS may seek Ecology approval to discontinue monitoring soil moisture. Monitoring the integrity of the cap and berm and dike system will continue indefinitely.
- The following actions will be undertaken if either of the following occurs: a) concentrations of arsenic in the cap lysimeters exceed arsenic concentrations in the upgradient lysimeter; or b) in the event the upgradient lysimeter is dry or contains insufficient moisture for sampling and the cap

lysimeter results exceed 5 ppb for arsenic:

- sampling frequency will be increased to monthly to accumulate a statistically meaningful data set;
- the CAP will be reopened for evaluation by Ecology and the USFS; potential future actions may include additional site investigation, evaluation of background arsenic levels detected in upgradient soil-pore water, or additional capping measures to prevent the infiltration of soil water.

Monitoring adjacent off-site public drinking wells for arsenic would be performed semi-annually until monitoring of the site's suction lysimeters is discontinued.

12. OUTLINE FOR CAP ENGINEERING DOCUMENTS

The USFS will prepare engineering reports as required by MTCA regulations to implement the CAP.

A outline for the engineering reports is as follows:

Section A - Engineering Report

- 1) Cleanup goals which have been negotiated for the project
- 2) Summary of site conditions, to include references to prior work
- 3) Site maps depicting area of contamination and proposed capping area
- 4) Engineered features of cap design developed in the suitability investigation to include:
 - Design basis and justification
 - Protection of ingestion/surface soils
 - Protection of ground water
 - Geotechnical characteristics
- 5) Description of required permits and compliance with applicable regulations
- 6) Proposed schedule
- 7) Overview of compliance monitoring

Section B - Construction Plans and Specifications

- 1) Summary of construction activities
- 2) Diagrams depicting cap construction dimensions
- 3) Description of cap construction methods
- 4) Quality control measures for use during construction
- 5) Health and Safety Plan for construction activities
- 6) Spill Prevention Plan for construction activities

Section C - Operation and Maintenance Plan

- 1) Persons responsible for cap maintenance
- 2) Description of cap maintenance activities
- 3) Integration of compliance monitoring plan with cap maintenance
- 4) Form and procedures which will be used for cap maintenance
- 5) Parts and equipment repair vendors for cap and cap monitoring equipment repair
- 6) Contingency procedures

Section D - Compliance Monitoring Plan

- 1) Sampling locations and frequency
- 2) Analytical methods and QA/QC specifications
- 3) Description of statistical methods which will be used