

ACTION MEMORANDUM

Non-Time Critical Removal Action Kiggins/Nisbet Mine Project



Mt. Hood National Forest
Clackamas County, Oregon

February 2008

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I. Purpose

The purpose of this Action Memorandum is to document my decision to proceed with the non-time-critical removal action described in the Engineering Evaluation/Cost Analysis (EE/CA) for the Kiggins and Nisbet Mines (Site) located in Clackamas County, Oregon. The EE/CA provides detailed analyses and the basis for the proposed response action and can be reviewed at the Clackamas Ranger District on the Mt. Hood National Forest located in Estacada, Oregon and can be obtained by going to:

<http://www.fs.fed.us/r6/mthood/projects/>

The selected Response Action will be executed following non-time-critical removal action processes described by:

- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA; 42USC 9604)
- National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40CFR Part 300)
- US Environmental Protection Agency's (EPA) *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA*; OSWER 9360.0-31, August 1993.

II. Site Conditions and Background

A. Site Description

(The following highlights the site features. For a more detailed description, please see the Site Inspection (SI) located at the website shown above.)

1. Kiggins Mine

- Latitude/Longitude: 45° 04' 37" North/121° 58' 39" West
- NE ¼ of the SE ¼ of Section 5, Township 6 South, Range 7 East of the Willamette Meridian.
- The Oak Grove Fork of the Clackamas River (OGF) flows along the northeast side of the Site.
- Access is via a dilapidated wood bridge from FR 4630-024, which crosses the OGF.
- According to Brooks (1963), three adits are associated with the Kiggins Mine.
- The total volume of wasterock at the Kiggins Mine is 25cy.

2. Nisbet Mine

- Latitude/Longitude: 45° 04' 49" North/121° 58' 50" West
- SW ¼ of the NE ¼ of Section 5, Township 6 South, Range 7 East of the Willamette Meridian.
- According to Brooks (1963), five adits and one shaft existed at the Nisbet Mine. Only two adits were located during the SI.
- The total volume of wasterock and material at the Nisbet Mine is estimated at 60cy.

B. Physical Location

1. Clackamas County in Northwest Oregon
2. Site is located in the Cascade Mountain physiographic province.

- Province is further subdivided into the High Cascades dominated by high glaciated volcanic peaks and rocks less than 10 million years in age, and the older more-weathered Western Cascades with rocks ranging from approximately 42 to 10 million years in age.
 - The Site is located near the boundary of these two-sub-provinces and on the extreme eastern edge of the older Western Cascades.
3. Nisbet mercury mine is located along the southwest bank of the OGF, approximately 0.9 miles downstream from the Lake Harriet dam, at River mile 4.1 to 4.2.
 4. Kiggins mercury mine is located along the southwest bank of the OGF, about 0.3 miles downstream from the Lake Harriet dam, at River Mile 4.6 to 4.9.

C. Site Characteristics

1. The only reported commodity at the Site was mercury.
2. Primary mineral was cinnabar and the gangue was calcite and stilbite.
3. Ore deposits were found in fissure veins constituted mainly of banded calcite and at least one stilbite vein, and in narrow fracture fillings in the basalt adjacent to the veins.
4. Ore veins reportedly ranged from 6 inches to about 6 feet in width in zones 10 to 15 feet wide.
5. One vein reportedly contained from 10 to 90% stibnite and was 2 to 12 inches wide.

D. Site History

1. The Site was productive between 1930 and 1943.
2. The following table lists the estimated production from each mine.

<u>Production Estimates (in flasks of mercury)</u>		
	Kiggins Mine	Nisbet Mine
	1934 20	NA
	1935 16	NA
	1936 12	NA
	1937 NA	18
	1938 5	7
	1939 9	5
	1940 5	57
	1941 4	9
	1942 NA	3
	1943 <u>NA</u>	<u>3</u>
Totals	71	102

3. The Site is currently abandoned with old mining debris and wasterock covering approximately 2 acres.
4. The following ore beneficiation/processing structures and foundations were observed:
 - Furnace foundation, ore bin/hopper, crusher, retort foundation, and a wooden building with a small furnace/retort.

- The original furnace was built into the cliff wall along the OGF, with retort condenser tubes being scattered though out the area.

E. Removal Site Evaluation

1. Summary

- Based upon the human risk assessment, unacceptable human health risks are present at the Site and are attributed to the presence of a single hotspot of mercury at the Kiggins Mine and two hotspots of arsenic at the Nisbet Mine
- Note: After further boundary investigation, it was determined the two hotspots of arsenic are actually located on the Ames-Bancroft patented mining claim, which is private land.
 - Note: Physical location will be field verified during the removal action. If these arsenic hotspots are determined to be located on USDA Forest Service administered land, they will removed.
- Unacceptable risks were predicted for both human and ecological receptors using the worst case exposure scenarios; however, based on the Site setting and remote location, no unacceptable risks for human and ecological receptors remain once the mercury hotspot is removed from the Site.
- The human risk assessment determined that there are no unacceptable human health risks from potentially contaminated surface water, pore water within sediments, and sediment.

2. 2003 to 2005 – Forest Service completed site characterization and an EE/CA with streamlined risk assessment for the Site. The following summarizes the results of this work:

- Kiggins
 - o During the Abbreviated Preliminary Assessment (APA), arsenic was the prevalent element of concern as it was the only element detected that exceeded EPA Region IX PRGs.
 - o Based on the Oregon Department of Environmental Quality (ODEQ) preliminary scoring, this Site ranks high for potential impacts on the environment (APA Appendix C).
- Nisbet
 - o During the APA, arsenic was the prevalent element of concern as it was the only element detected that exceeded EPA Region IX PRGs.
 - o Based on a literature search, it appears much of the waste rock and processed ore were dumped into the OGF.
 - o Considering the ore material assayed at 9 pounds of quicksilver per ton and it appears 150 flasks were produced and each flask weighs 43 pounds, it is conceivable that a good majority of the 720 tons of ore material was placed in the river.
 - o Based on the ODEQ preliminary scoring, this Site ranks high for potential impacts on the environment (Appendix B).
- **Groundwater Pathway**
 - o Groundwater is used for drinking water within 4 miles of the Site from two wells located downstream of the Site.
 - o The nearest down gradient well is over 1 mile west of the Site and both are located north of the OGF and topographically at a higher elevation.
 - o Based on this, the groundwater pathway appears to be incomplete and no further assessment is warranted.

- **Surface Water Pathway**
 - o Metals (primarily arsenic and mercury) have been released into the OGF from the Site, and appear to have slightly impacted stream sediments, surface water, and pore-water.
 - o Arsenic and mercury concentrations in surface water, pore water within sediment, and sediment samples collected above the Site and adjacent to the Fall Vein were higher than several of the applicable comparison criteria.
 - o Addressing and/or eliminating the soil pathway will likely render the surface water pathway incomplete.
- **Soil Pathway**
 - o The waste piles contain elevated concentrations of metals (arsenic and mercury), which exceeded numerous comparison criteria (both human and ecological).
 - All waste source samples collected exceed the EPA Industrial PRG for arsenic (cancer endpoint); and mercury concentrations in 12 of the 16 samples.
 - o Numerous federal and state rare, threatened and endangered mammals, birds, and herpetiles have potential habitat in the vicinity of the Site.
 - o Based on this information, the soil exposure pathway is considered complete for both human and ecological receptors, and a release of hazardous substances has been documented in the SI.
- **Air Pathway**
 - o The most likely air pathway is due to inhalation of particulate matter.
 - o This pathway is considered complete because arsenic and mercury impacted soil and waste material is concentrated at the surface where human and ecological receptors could be exposed to particulate matter.
 - o Addressing and/or eliminating the soil exposure pathway will likely render the air exposure pathway incomplete.

F. Release or Threatened Release into the Environment of a Hazardous Substance.

1. Water
 - Mercury and zinc concentrations exceeded ecological regulatory requirements and background concentrations.
2. Sediment
 - Arsenic concentrations exceeded ecological regulatory requirements and background concentrations.
3. Wasterock
 - Arsenic concentrations exceeded human health regulatory requirements and background concentrations.
 - Lead, mercury, and zinc concentrations exceeded ecological regulatory requirements and background concentrations.

G. National Priority List Status

1. The project site has not been proposed for the National Priority List (NPL), and a Hazard Ranking System (HRS) rating has not been calculated.

H. Other Actions to Date

1. Previous Actions
 - None

I. State and Local Authorities' Role

1. State and Local Actions to Date
 - Site is listed on the Oregon Department of Environmental Cleanup Site Information Database.
 - Kiggins ID # 3812
 - <http://www.deq.state.or.us/lq/ECSI/eccsidetail.asp?seqnbr=3812>
 - Nisbet ID # 3811
 - <http://www.deq.state.or.us/lq/ECSI/eccsidetail.asp?seqnbr=3811>
2. Potential for Continued State/Local Response
 - None for this Site although it is possible the State may initiate a response at the Ames-Bancroft site, which is private property via a patented claim and is adjacent to the Site.

III. Threats to Public Health or Welfare and the Environment, and Statutory and Regulatory Authorities

A. Threats to Public Health and Welfare

1. There is a threat to public health or welfare as set forth in the NCP [40CFR 300.415(b)(2)].
2. Metals of greatest potential human health concern are mercury (37,100 mg/kg) and arsenic (5229 mg/kg).
 - Both metals exceed EPA Region IX Preliminary Remedial Goals (PRG's) 310 mg/kg for mercury and 1.6 mg/kg for arsenic and exceed Oregon Department of Environmental Quality soil screening criteria.
 - High concentrations of mercury and arsenic pose a human health threat to hikers and other recreationists who are often attracted to old mining sites.
 - Human health risk assessments at other abandoned mine sites have established a cleanup level ranging between 50-85 mg/kg for arsenic.
 - State of Oregon specific hotspot criteria requires cleanup of highly concentrated and highly mobile contaminants.
3. Refer to the following table for a summary of analytical results.

SUMMARY OF ANALYTICAL/DOCUMENTED CONTAMINATION

Media	Sample Location	Rate of Discharge /Volume (cfs, gpm, or CY)	Contaminant	Highest Concentration	Lowest Criteria Eco – Ecological HH – Human Health	Background Concentration
Surface Water	OGF-SW-6	24 cfs	Zinc, TR	50 ug/L	30 ug/L – Eco	10B ug/L
	KM-SW-1	10 gpm	Aluminum, TR	230 ug/L	87 ug/L – Eco	<30 ug/L
	KM-SW-2	5 gpm	Aluminum, TR Mercury, TR	420 ug/L 0.308 ug/L	87 ug/L – Eco 0.012 ug/L – Eco	<30 ug/L 0.00242 ug/L
Pore Water	OGF-PW-4	23 cfs – surface water	Mercury, Diss	0.0473ug/L	0.012 ug/L – Eco	0.00634 ug/L
	OGF-PW-6	24 cfs – surface water	Arsenic V, Diss Mercury, Diss	20.445 ug/L 0.222 ug/L	3.1 ug/L – Eco 0.012 ug/L – Eco	3.543 ug/L 0.00634 ug/L
	OGF-PW-7	36 cfs – surface water	Copper, Diss	4.0 ug/L	0.23 ug/L – Eco	<0.5 ug/L
Sediment	OGF-SS-3	Note Applicable (NA)	Arsenic	32 mg/kg	5.9 mg/kg – Eco	16.4 mg/kg
	OGF-SS-7	NA	Arsenic III Arsenic	11.89 mg/kg 61.178 mg/kg	6 mg/kg – Eco 5.9 mg/kg – Eco	0.067 mg/kg 14.225 mg/kg
	KM-SS-2	NA	Arsenic	24.7 mg/kg	5.9 mg/kg – Eco	16.4 mg/kg
Waste Rock / Waste Material (All Samples)	Kiggins Mine	~750 CY Total	Antimony Arsenic Iron Lead Mercury Thallium Vanadium Zinc	29 mg/kg 1,140 mg/kg 135,000 mg/kg 119 mg/kg 37,100 mg/kg 7.91 mg/kg 424 mg/kg 164 mg/kg	5 mg/kg – Eco 1.6 mg/kg – HH 10 mg/kg – Eco 16 mg/kg – Eco 0.1 mg/kg – Eco 1.0 mg/kg – Eco 2.0 mg/kg – Eco 8.5 mg/kg – Eco	0.37 mg/kg 90.97 mg/kg 53,366 mg/kg 7.5 mg/kg 8.23 mg/kg 0.73 mg/kg 120 mg/kg 75.33 mg/kg
Waste Rock / Waste Material (All Samples)	Nisbet Mine	~100 CY Total	Antimony Arsenic III Arsenic Mercury Thallium	15 mg/kg 24.2 mg/kg 5,229 mg/kg 3,300 mg/kg 22.3 mg/kg	5 mg/kg – Eco 10 mg/kg – Eco 1.6 mg/kg – HH 0.1 mg/kg – Eco 1.0 mg/kg – Eco	0.37 mg/kg NA 90.97 mg/kg 8.23 mg/kg 0.73 mg/kg

Notes: This table only lists sample concentrations that are at least 1.5 times higher than the lowest criteria and/or background concentration. These exceedances are considered the major contaminants of concern (COCs) and not a complete list of all COCs.

Highest background concentration in waters and sediments used since only two samples were collected; background soil concentrations listed are the average of three samples.

TR = Total Recoverable Metals; Diss. = Dissolved Metals; ug/L = micrograms per liter; mg/kg = milligrams per kilogram; NA = Not Analyzed

B. Threats to the Environment

1. The source of risk to plants and invertebrates at the Site is minimal. The plants and invertebrates within this localized area are unlikely to be significantly impacted within the vicinity of the project area because of the localized and small exposure areas.
2. There is some potential risk to the aquatic ecological receptors from release of sediments from the site contaminated with arsenic, mercury, and methyl mercury. This risk will be eliminated following the removal action, which includes contouring, shaping of the wasterock, and covering all disturbed areas with topsoil to prevent migration from the Site.
3. Metals of greatest potential ecological concern include aluminum, antimony, arsenic, barium, chromium, cobalt, copper, iron, manganese, mercury, nickel, selenium, thallium, vanadium, and zinc. With the exception of arsenic and mercury, these metals were not found in high concentrations.
4. Refer to the Table in Section III. A.

IV. Endangerment Determination

Actual or threatened releases of hazardous substances (mercury and arsenic) from this Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment. Arsenic and mercury will continue to migrate into the environment without a response action.

V. Proposed Actions and Estimated Costs

A. Proposed Actions

1. Proposed Action Description
 - Alternative 2 – Excavation and Offsite Disposal of Mercury Hotspot
 - o Building Material, Equipment, and Debris Demolition/Disposal
 - o All metal, wood, equipment, and other miscellaneous nuisance debris that pose a potential physical or chemical hazard to Site users will be removed from the Kiggins Mine. Nisbet Mine debris would not be removed due to access restrictions.
 - o To the extent possible, concrete foundations will be left intact.
 - o CES estimates that 20 tons of material will be disposed offsite at the local Subtitle D Landfill.
 - o The dilapidated bridge that crosses the OGF to the Kiggins Mine will be removed for safety reasons and to reduce access to the Site.
 - o CES will coordinate with the Forest Service to determine the historical significance of the buildings and structures.
 - o Kiggins Mine Retort Vent Plugs
 - The area surrounding the condenser tube holes of the original Kiggins Mine retort (built into the bank of the OGF) will be inspected to determine if water is flowing through the retort.
 - If it is determined that significant water is, or has the potential to flow through the holes, the vent holes will be capped with a mixture of cement and bentonite to control the migration of water through the retort and eventually into the OGF.

- o Waste Material Grading at the Kiggins Mine
 - All wasterock and material at the Kiggins Mine (750cy) would be contoured and a thin layer of cover soil applied (100cy).
 - Cover soil will be borrowed from nearby areas and not brought in from offsite. The contoured area would be fertilized, seeded, and mulched.
- o The hotspot at the Kiggins Mine (~25cy) will be excavated and transported offsite for disposal.
 - The waste material will have to be transported to the nearest Subtitle C landfill, which is located in Arlington, Oregon (round trip haul of ~200 miles).
- o The excavated areas will be contoured to pre-mining conditions wherever feasible
 - Visual observations and a Niton dual source XRF will be used to delineate the extent of the excavations; confirmation samples will be collected and sent to the laboratory to document the removal.
- o Disturbed areas (~2 acres) will be contoured and vegetated. Vegetation would consist of fertilizing, seeding, and mulching of all disturbed areas.
 - Certified weed free straw mulch would be applied to control erosion during plant establishment.
 - The seed mix will be selected following consultation with the Forest Service.

Note: The physical location of the two arsenic hotspots will be field verified during the removal action. If these arsenic hotspots are determined to be located on USDA Forest Service administered land, they will be removed.

2. Contribution to Remedial Performance
 - No further response actions are anticipated
3. Description of Alternative Technologies
 - Numerous technologies were considered. Refer to Table 4 – *Removal Action Technology Screening Summary* located in the table section of the EE/CA.
 - Three alternatives were applicable for this site:
 - o Alternative 1 - No Action
 - o Alternative 2 - Excavation and Offsite Disposal of Hotspots
 - o Alternative 3 – Excavate and Onsite Disposal of Hotspots
4. Refer to the following tables located in the EE/CA for comparative analysis of the proposed alternatives:
 - o Table 5. Comparative Analysis of Removal Action alternatives.
 - o Table 6. Attributes and Advantages of Removal Action Alternatives.
5. Engineering Evaluation/Cost Analysis
 - CES, consultants to the Mt. Hood National Forest, prepared the EE/CA and the EE/CA is incorporated in this Action Memorandum by reference.
 - The Forest Service released the EE/CA for a thirty-day public comment period to solicit comments and concerns.
 - o Comments were received by the Oregon Department of Environmental Quality (ODEQ) after the 30-day Public Comment Period.
 - o The Forest Service responded to the comments from ODEQ in a letter dated August 23, 2006.

- o In addition, the Forest Service has responded to ODEQ in letters dated April 13, 2006 and April 27, 2007 concerning Notice of Assessment Review for the Ames-Bancroft Mine and listing of the site respectively on the State of Oregon Confirmed Release Inventory.
- o The comments and letters are part of the Administrative Record for this Site and available at the following website:

<http://www.fs.fed.us/r6/mthood/projects/>

- o The significant comments (*italics*) and response are included here and both the comments and responses are located in the Administrative Record.
 - *Additional investigation is needed to determine if contamination is present at the Ames-Bancroft mining site.*

Since Ames-Bancroft is a patented claim (private land), the Forest Service did not perform sampling and does not have authority to conduct a removal action on this site.

- *Additional testing is needed to define the full vertical and horizontal extent of metals contamination in mining wastes, soils, and sediment associated with the Kiggins and Nisbet mine sites.*

The Site Inspection (SI) conducted by Cascade Earth Sciences in 2003 was sufficient to characterize the contaminants at both sites. Monitoring will occur during the removal action at the Kiggins Mine. If additional contaminants are discovered, they will be addressed during the removal action. A removal action at the Nisbet Mine is not warranted based upon the risk assessment conducted during the Engineering Evaluation/Cost Analysis (EE/CA) and the fact that the two hotspots of arsenic contamination are actually located on the Ames-Bancroft patented mining claim, which is private land.

Note: The physical location of the two arsenic hotspots will be field verified during the removal action. If these arsenic hotspots are determined to be located on USDA Forest Service administered land, they will be removed.

Furthermore, it is the Forest Service's belief that the concentration of metals in the wasterock piles at the Site is relatively constant throughout the entire depth of the piles. The uniformity of the metal concentrations is based on visual observations around the perimeter of the piles, sampling from the sides of the piles, and the homogeneous soil characteristics of the piles. In addition, the material did not fail either the TCLP or the SPLP analyses and therefore, the possibility of any leaching into native ground beneath the waste rock piles is not likely.

- *Further testing is needed to determine whether fish and benthic macroinvertebrates in the Clackamas River Oak Grove Fork have been contaminated.*

As demonstrated in the SI conducted by Cascade Earth Sciences in 2003, a thorough ecological survey was completed, which included fish and benthic macroinvertebrates. As outlined in the SI, the ecological survey included an analysis of the benthic macroinvertebrate population abundance, diversity, and metals tolerance at seven aquatic stations upstream, adjacent to, and downstream of the mines. The benthic macroinvertebrate survey results suggest that there is little or no evidence of impacts to surface water quality downstream of the mines. It is unlikely that migratory fish inhabit this reach of the OGF because of a large waterfall approximately one mile downstream of the Nisbet Mine, which is a natural fish barrier. During the SI, only a couple of small trout were observed in the vicinity of the Nisbet Mine and it is believed these fish were present in this reach of the OGF most probably from being washed over the Lake Harriet dam spillway during high flow events.

During the removal action at this Site, the contaminated wasterock will be contoured and shaped to prevent surface erosion and riling and covered with topsoil. This should prevent any migration of contaminates into the reach of the OGF.

As outlined in the SI, concentrations of several metals (i.e., arsenic) in surface water and pore water samples collected upstream of the mines was higher than the downstream samples. In addition, metal concentrations in upstream sediment samples were also elevated compared to several downstream samples. It should be pointed out that the flow measured at station OGF-02, which is directly below the dam, was 5.9 cfs while the flow measured at station OGF-07 was 36.3 cfs. Sam Creek was the only stream observed in this section. However, Sam Creek does not carry a significant flow (10 gpm) to account for an increase in the flow as measured at station OGF-07 by a factor of 6 fold. Therefore, there are other sources of water that are more than likely contributing to some of the elevated metals at station OGF-06 and -07 other than from the mines. In addition, groundwater in the mineralization zone of the area is more than likely occurring and contributing to the metal loading at station OGF-06 and -07. Both mines were dry and therefore, not likely contributing to the flow of OGF and of little significance to the overall health.

The OGF cuts through the Fall Vein, a natural occurrence of cinnabar. The area is highly mineralized and as such, performing any tissue sampling and testing would not prove whether or not the fish were contaminated by these natural occurrences or from the mines. While historically wasterock from these operations was likely deposited into the river, during the site inspection, no significant evidence was encountered to suggest that this material was still present within this reach of the river. Therefore, no tissue sampling will be conducted during the removal action.

In addition to the previously established monitoring stations, two water monitoring stations will be installed further downstream of the mines and will be sampled during post removal action monitoring. These stations will be monitored for a period of three years. Results will be analyzed and should additional action be required, a determination would be made at that time as to the appropriate response action.

- *At least two of the background soil samples for the 2003 Site Inspection appear to have been collected on other mining or prospect sites, and could have been contaminated with mining wastes. Additional testing is needed to define true background soil conditions.*

Background samples were not collected from mining sites or prospects; samples were collected from undisturbed native background locations below organic horizons at a minimal depth of 12-inches. However, more samples would be needed to determine the 90% UCL. Regardless, the background sampling results were not used to establish cleanup levels of metals. The average of background concentrations was used in the risk assessment to determine the metals of interest. The Forest Service considers this to be a conservative approach, since the 90% UCL would be higher than the average concentration. Therefore, additional background sampling will not be conducted during the removal action.

- *Further studies are needed to better-define whether sensitive plant or animal habitat is present at, or immediately down gradient of, the mining sites, and to determine whether terrestrial species have been affected by site contaminants.*

As presented in the SI, an ecological survey was completed to assess the sensitive species at and around the mines. Specifically, plants, birds, terrestrial macroinvertebrates, and mammals were inventoried and assessed. While plants and invertebrates within the waste piles may be at risk, the populations are unlikely to be

significantly impacted within the vicinity of the site because of the small dispersed exposure areas. Therefore, no additional studies will be conducted.

- *Contaminated mining wastes, soil, and sediments need to be cleaned up.*

The Forest Service plans to conduct a removal action at the Kiggins Mine. Based on the risk assessment, only a hotspot cleanup action is warranted. This would remove 25 cubic yards of highly elevated mercury in wasterock from the site.

5. Applicable or Relevant and Appropriate Requirements (ARARs)
 - ARARs are listed in Appendix B of the EE/CA. These include both Federal and State ARARs.
6. Project Schedule
 - The removal action is proposed for the spring of 2008.

B. Estimated Costs

1. Estimated removal action cost for the project is;
 - Datagap collection - \$20,000
 - Removal Action - \$165,000
 - Forest Service oversight - \$10,000
2. A detailed cost breakdown is shown in Appendix C of the EE/CA.

VI. Expected Change in the Situation Should Action be Delayed or not Taken

Sediment laced with high concentrations of arsenic and mercury will continue to be deposited into the OGF during snowmelt and heavy rainstorms.

VII. Outstanding Policy Issues

None

VIII. Enforcement

No viable responsible parties have been identified for this Site.

IX. Recommendation


A. Removal Action Justification

The NCP states that an appropriate removal action may be conducted at a site when a threat to human health or welfare or the environment is identified. The removal action is undertaken to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of a release at a site. Section 300.415(b)(2) of the NCP outlines eight factors to be considered when determining the appropriateness of a removal action. The applicable factors are outlined below and provide justification for completing the removal action. These factors are assessed against the preferred alternative in Section 8.0 of the EE/CA.

- “Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.”
 - Since abandoned mines, especially those sites containing old structures and equipment, attract hikers and other recreationists, it is likely they would come into contact or potentially be exposed to high concentrations of mercury at this Site.
 - The area is open to recreation use and the public is not controlled from entering the area or coming into contact with the mercury hotspot identified above.
- “High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.”
 - Surficial wasterock is contaminated with metals, specifically mercury, and currently, have the ability to migrate into the OGF during periods of heavy rainfall or rain on snow events.
- “Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.”
 - During the removal action, a field assessment will be made to determine if significant water is, or has the potential, to flow through the vent holes of the Kiggins mine original retort. If the water flow is suspected of causing migration of contaminants into the OGF, the vents will be capped with a mixture of cement and bentonite to control the migration of water through the retort.

This decision document represents the selected removal action for the Kiggins/Nisbet site, in Clackamas County, developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the site meet the NCP section 300.415(b)((2) criteria for a removal action, as discussed above, and I recommend your approval of the proposed removal action.

Recommended:  Date: 2/22/2008
 Gary Larsen
 Forest Supervisor
 Mt. Hood National Forest

Approved: _____ Date: _____
 Sam Carlson
 Director of Engineering
 Pacific Northwest Region

