KIGGINS AND NISBET MINES
INITIATION OF CERCLA INVESTIGATION
MEMORANDUM

I. PURPOSE

The purpose of this Memorandum is to document, pursuant to the Guidelines of the National Oil and Hazardous Substance Contingency Plan (NCP), 40 CFR 300, et seq., the decision to initiate a CERCLA investigation, and such further CERCLA actions as may be subsequently determined appropriate, as authorized by Section 104 (42 USC 9604) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; 42 USC 9601 et seq.), and Executive Order 12580, 52 Federal Register 2923-26 (January 23, 1987).

A release, or threat of a release, of hazardous substances, pollutants or contaminants that potentially pose a threat to public health or welfare or the environment, has occurred or may occur at the Kiggins and Nisbet Mine (Site) on and/or from lands under the jurisdiction, custody, or control of the USDA Forest Service, Mt. Hood National Forest (National Forest System or NFS lands).

II. SITE CONDITIONS AND BACKGROUND

A. Site Location and Historical Activities

Kiggins Mine

The Kiggins Mine is located approximately 31 miles southeast of Estacada, OR, on Forest Service Road 4630024. The mine is situated on moderate to steep hillsides and within 300 feet to the Oak Grove Fork of the Clackamas River. The mine is located within the Oak Grove Mining District of the Clackamas River Ranger District and included on the USGS Quadrangle Map – Mt. Mitchell. The location and legal description for the site is:

- Latitude: 45° 04’ 38”N
- Longitude: 121° 58’ 23”W
- Sec 5, T 6 S, R 7 E WBM

Nisbet Mine

The Nisbet Mine is located approximately 31 miles southeast of Estacada, OR, on Forest Service Road 4630025. The mine is situated on steep hillsides and within 100 feet to the Oak Grove Fork of the Clackamas River. The mine is located within the Oak Grove Mining District of the Clackamas River Ranger District and included on the USGS Quadrangle Map – Mt. Mitchell. The location and legal description for the site is:

- Latitude: 45° 04’ 49”N
- Longitude: 121° 58’ 29”W
- Sec 5, T6S, R7E WBM

Little information is available regarding the operational history of the Kiggins and Nisbet Mines. However, the following information was gleaned from *Quicksilver in Oregon (Schuette, 1938 and Brooks, 1963) and Quicksilver Deposits in Oregon (Brooks, 1971*). The following information is a chronological summary of the operational history of the Site and the estimated mercury production.

- 1923 to 24 - George Nisbet located the Vermilion group of claims.
- 1925 - Nisbet located the Oak Grove group of claims.
- 1926 - Nisbet constructed furnace near Vermilion group in rock cliff along OGF,
- 1927 - D.E. Kiggins given a 1/8 interest in the claims.
- 1927 to 1938 – Kiggins and Nisbet worked as partners.
- 1930 - Cylindrical shaft-type furnace erected on Oak Grove Group, capacity ~ 15 tons/day.
- 1938 - Nisbet gave Kiggins his interest in Vermilion group and took ownership of Oak Grove group for himself.
- 1940 - Option given on Kiggins claims to Horse Heaven Mines, Inc, which failed to exercise its option and property reverted to its owner.
- 1940 - Nisbet claims leased to Oregon Quicksilver, Inc headed by George S. Barton.
- 1940-41 – Oregon Quicksilver, Inc. produced 66 flasks from the Nisbet property using cylindrical shaft furnace.
- 1942 – E.O. Emil produced 3 flasks from Nisbet claims.

Production Estimates (in flasks of mercury)

	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	NA	3
Totals	**71**	**102**

B. Site Characteristics

The Kiggins and Nisbet Mines are located in the Cascade Mountain physiographic province. The 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 Kiggins and Nisbet Mines are located near the boundary of these two sub-provinces and on the extreme eastern edge of the older Western Cascades.

Geology in the vicinity of the Site consists of Pliocene and Miocene age basalt and basaltic andesite in flows, flow breccia and pyroclastic deposits. In addition, an area of more recent landslide and debris flow deposits is mapped immediately west of the Site. Regional faulting is dominated by southeast to northwest trending normal faults (USGS, 1991).

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

The calcite veins appear to have been introduced into open fractures in the basalt. Displacement along the fractures is evidently slight, although locally the basalt adjacent to the veins is brecciated and has been altered by hydrothermal solutions to a dark, gray-green rock, which contains considerable clay and is locally stained by limonite. The calcite veins commonly have a banded structure. Crystal interspaces in the veins commonly are filled with felted mixtures of quartz, opal, heulandite or stilbite, calcite and locally pyrite, ilsemannite, jordisite and cinnabar.

The following site-specific geology is summarized from *Quicksilver in Oregon (Schuette, 1938 and Brooks, 1963)* and based on field observations. The reader is directed to the full report for more details.

Kiggins Mine

- The mine includes 330 feet of drifts and stopes and 200 feet of crosscuts among three adits.
- Three veins are exposed, Vermillion, Stope and Falls, all of which lie in the northwest quadrant and dip to the northeast.
- The workings are near the same altitude near the back edge of a river terrace.
- The No. 1 Adit follows the Vermillion vein 180 feet northwestward.
- The Stope vein is also present in the No. 1 Adit, which extends westward 30 feet and upward 17 feet. The Stope vein was 8 inches thick with about 6 pounds of mercury per ton of vein material.
- The No. 2 Adit followed the downward extension of the Vermillion vein which has a pitch 50 degrees to the east.
- The No. 3 Adit explored the southeast extension of the Vermillion vein, which in that adit, dipped 35 degrees northeast.
- The Fall vein crops out in the channel of the OGF from a point east of the existing bridge (north of the "powderhouse") downstream for a distance of 250 feet. The river follows the more easily eroding vein, which is 3 to 5 feet in width and 10 to 20 feet deep.

Nisbet Mine

- The mine includes approximately 500 feet of underground workings divided among five adits and a shaft. The mine also includes several open crosscuts. Only Adit No. 1, near the base of the slope adjacent to the OGF remains open; the other adits and the shaft are caved or collapsed.

- The mine is developed around four veins: the Zeolite vein, the Oak Grove vein, the Sluice vein, and the Ben vein. The Zeolite vein was responsible for most of the production of the mine.
- The Zeolite vein was developed by an adit, an inclined shaft, and a stope; The Oak Grove vein by two adits and a surface trench; and the Ben vein by one adit and a small stope.
- The Oak Grove vein strikes east and dips 70 to 80 degrees north. It was explored with a horizontal distance of 100 feet and a vertical distance of 100 feet. It ranged from 6 inches to 6 feet thick.
- The Oak Grove vein is mineralized with cinnabar, calcite, and silica.
- Additional workings explored the West and Top Hole veins.

C. Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

A Site Inspection has been completed at the Site to determine if a release or threat of a release has occurred and it has been determined that a release has occurred and that an Engineering Evaluation/Cost Analysis is warranted.

D. Actions Taken on the Site

Recent actions taken at the Site include:

1. *Abbreviated Preliminary Assessment, USFS 04/03*
2. *Site Inspection, CES 02/04*

III. PROPOSED ACTIONS AND ESTIMATED COSTS

The proposed action for the Site is to initiate CERCLA. In compliance with the NCP, an Engineering Evaluation/Cost Analysis (EE/CA) will be performed to evaluate removal alternatives.

The anticipated costs for the various aspects of the project are uncertain at this time as valuable data is missing. However, costs for work completed and an estimate of future work is:

1. APA - $4000
2. SI - $100,700
3. EE/CA - $60,000 to $80,000
4. Removal Action - $800,000
5. Three year monitoring - $75,000
6. Total Anticipated Cost - $1,060,000

IV. ADMINISTRATIVE RECORD AND COMMUNITY RELATIONS

Pursuant to 40 CFR 300.415(m), I designate Dennis Boles of the Fremont/Winema National Forest as the On-Scene Coordinator and Thomas DeRoo, Clackamas RD of the Mt. Hood National Forest, as Spokesperson for the project.

A Community Relations Plan will be developed for this project. The Administrative Record for any response action selected will be compiled and made available during regular business hours at the office of the Clackamas RD, Mt. Hood National Forest, Estacada, Oregon. A Notice of Availability of the Administrative Record will be published in local newspapers.

V. DECISION

By this Memorandum, I am initiating CERCLA activities at the Kiggins and Nisbet Mines as appropriate.

By copy of this Memorandum, we are formally notifying the State of Oregon and EPA of our finding of the appropriateness of initiating CERCLA activities at the Site.

S/ Richard Sowa
Richard Sowa
Director of Engineering
Pacific Northwest Region

Date: 02/26/04

cc:
Oregon DEQ
EPA