DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1534-D
PAMPHLET ACCOMPANIES MAP

Base from U.S. Geological Survey 1:24,000, 1963
Bonnet Top, Boulder Lakes,
Lost Horse Mountain, Mount Henry;
Robinson Mountain, Yaak

SCALE 1:50 000

1 ½ 0 1 2 3 MILES
1 .5 0 1 2 3 KILOMETERS
CONTOUR INTERVAL FEET

Geology mapped by R. E. Van Loenen and J. E. Harrison, 1981; assisted by G. Wadsworth

MINERAL RESOURCE POTENTIAL MAP OF THE MOUNT HENRY ROADLESS AREA, LINCOLN COUNTY, MONTANA

By
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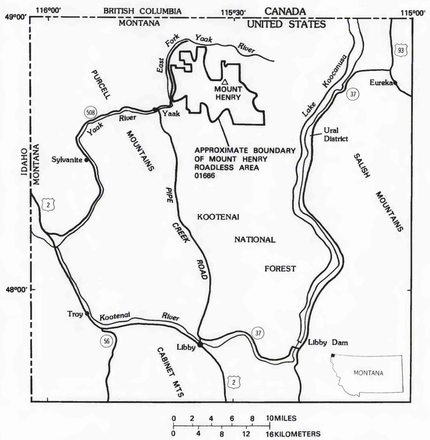
1983

CORRELATION OF MAP UNITS

Qal, Qg		Holocene, Pleistocene	QUATERNARY
Ywm, Yh, Ywl, Yhl	Middle Belt Carbonate	Belt Supergroup	MIDDLE PROTEROZOIC
Ye, Ysr, Yr, Ybu, Ybl	Ravalli Group		
Yput, Ypu, Ypl	Lower Belt		

EXPLANATION OF MAP UNITS

Qal	Alluvium
Qg	Glacial Debris
	Middle Belt Carbonate
	Wallace Formation (Western Facies)
Ywm	Middle Member - Black argillite, dolomitic argillite and siltite
Ywl	Lower Member - Green argillite, silty dolomite
	Helena Formation (Eastern Facies)
Yh	Middle Member - Black and tan dolomite, argillaceous and silty limestone
Yhl	Lower Member - Bluish-gray dolomite, argillite, silty dolomite
Ye	Empire Formation - Black and green argillite and silty argillite carbonate bearing
Ysr	St. Regis Formation - Purple and green argillite and siltite
Yr	Revett Formation - Purple, gray, green, quartzite, argillite and siltite
	Burke Formation
Ybu	Upper Member - Gray, green, and purple argillite, silty argillite
Ybl	Lower Member - Gray siltite, argillite
	Prichard Formation
Yput	Upper Transition Member - Gray, black and white argillite, siltite
Ypu	Upper Member - Black and white argillite, siltite
Ypl	Lower Member - Gray siltite, argillite, and quartzite



INDEX MAP SHOWING LOCATION OF THE MOUNT HENRY ROADLESS AREA (01666), LINCOLN COUNTY, MONTANA

EXPLANATION

- CONTACT
- NORMAL FAULT--Approximately located; dotted where concealed. Bar and ball on downthrown side
- THRUST FAULT--Dotted where concealed. Sawteeth on upper plate
- ANTICLINE--Dashed where approximately located
- SYNCLINE

STRIKE AND DIP OF BEDS

- 30 Inclined
- 70 Overturned
- AREA OF LOW POTENTIAL FOR COPPER-SILVER RESOURCE
- ▲48 Ag_{15} ROCK SAMPLE LOCALITY--Showing anomalous element value in parts per million
- ●12 S $Ag_{.05}$ STREAM-SEDIMENT SAMPLE LOCALITY--Showing anomalous element value in parts per million
- ●72C $Au_{.25}$ PANNED-CONCENTRATE SAMPLE LOCALITY--Showing anomalous element value in parts per million

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Mount Henry Roadless Area (U.S. Forest Service area 01666) in the Kootenai National Forest, Lincoln County, Montana. The Mount Henry Roadless Area was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

SUMMARY

Low-grade metasedimentary rocks in the Revett and Burke Formations of the Belt Supergroup in the western part of the Mount Henry Roadless Area have a low potential for strata-bound copper-silver mineral deposits. Geologic structures have a low potential for containing other metallic minerals. No mines or prospects exist within the Mount Henry Roadless Area, and there has been no record of mineral production.

INTRODUCTION

The Mount Henry Roadless Area lies within the Kootenai National Forest in Lincoln County, Mont., and is approximately 36 mi north of Libby, Mont. The area covers 23,000 acres of the heavily forested Purcell Mountains in the drainage basin of the Kootenai River.

GEOLOGY

The Mount Henry Roadless Area is located within the central part of the Belt terrane, a thick succession of low-grade metasedimentary rocks collectively termed the Belt Supergroup. These rocks are of middle Proterozoic age (900-1,400 m.y.), and they consist of fine-grained clastics and carbonates. Structurally, the rocks of this region are thought to be an allochthonous part of an extensive fold and thrust belt that has been transported eastward many kilometers across coeval autochthonous rocks in the cordillera of Idaho, Montana, and southern Canada (Harrison and others, 1980). The dominant structural feature within the roadless area is a broad anticline with a north-south axis. The anticline is nearly bisected by a north-trending thrust fault. Movement along this fault is from west to east and probably only a few thousand feet. A series of north- to northwest-trending high-angle faults transect the area. Weak mineralization deposited traces of metallic elements along some of the high-angle faults.

Erosion of the anticline in the roadless area has exposed nearly 16,000 ft of the sedimentary sequence, ranging from the lower member of the Prichard Formation into the middle Belt carbonates.

A geologic map, cross section, and description of rock units are in Van Loenen (1983).

MINERAL RESOURCE POTENTIAL

There is very little evidence of a potential for minerals or fuels within the Mount Henry Roadless Area. Randomly scattered, weakly anomalous concentrations of metals do not define or indicate any significant mineralized zones. Sample sites shown on the map indicate rock or stream-sediment samples that contain any gold or silver, and sample sites where more than one base metal was anomalous (Siems and others, 1983).

In studying the mineral resource potential of the study area, two potential host rocks were given special attention: the Revett Formation for possible copper-silver mineral deposits and the Prichard Formation for possible lead-zinc mineral deposits.

The Revett Formation contains a copper-silver deposit in the Spar Lake district 55 mi south of this area, where strata-bound ore is currently being mined from quartzites. The Mount Henry area lies just north of a "western sulfide belt" described by Harrison (1972) as an area of the Belt Basin favorable for the occurrence of strata-bound copper-silver deposits. Of thirty rock samples collected from the Revett Formation in the study area, only one, sample (VMH-77), contains anomalous copper (70 ppm). No anomalous concentrations of silver were detected (Siems and others, 1983). Within the study area there is little or no evidence of a potential for deposits of copper and silver in the Revett Formation.

Some copper and silver occur near the Revett contact in the uppermost part of the Burke Formation just outside the study area boundary along Yodkin Creek (see sample number VMH-7, southwest part of map). Host rocks are green and purple siltite interlayered with thin light-gray quartzite and calcareous argillite. Bornite (Cu_5FeS_4) is the primary copper mineral with secondary malachite ($Cu_2CO_3(OH_2)$) coating fracture surfaces. The rock containing metallic minerals is only a few inches thick and probably is not extensive laterally. Channel samples taken several feet above and below the exposed metal-bearing rock contain only trace amounts of copper. Small isolated occurrences such as this are not uncommon in Ravalli group rocks throughout the Belt Basin, and none within the Burke Formation is known to be of economic importance. A low potential was assigned to this small area containing copper- and silver-bearing minerals based on available data.

Strata-bound lead-zinc mineral deposits occur in lower Belt rocks approximately 60 mi north of the study area, near Kimberley, British Columbia, where high-grade lead-zinc ore is being mined from the Middle Aldrige Formation (Canadian equivalent to the lower Prichard) at the Sullivan mine. Stratigraphically, the Sullivan type mineralization, if found in the Mount Henry area, would occur several thousand feet below the surface and well below the lower Prichard exposures. This favorable stratigraphic horizon is exposed a few miles west of the area, where it contains no known lead-zinc deposits.

No gold was found in any stream-sediment samples or concentrates collected from the study area though some placer claims were staked in early days. However, a stream-sediment sample collected from Vinal Creek west of the study area contains detectable gold. It is possible this trace amount of gold came from the thick glacial deposit present at the sample site. No evidence was seen to suggest any gold potential for the Mount Henry Roadless Area.

The oil and gas potential of the Mount Henry Roadless Area is unknown. No drilling has been done anywhere in the region. Phanerozoic source rocks conceivably could exist beneath the allochthonous Belt Supergroup rocks of the area, but their presence, location, or potential are not known.

REFERENCES

Harrison, J .E., 1972, Precambrian Belt Basin of northwestern United States--Its geometry, sedimentation, and copper occurrences: Geological Society of America Bulletin, v. 83, no. 5, p. 1215-1240.

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