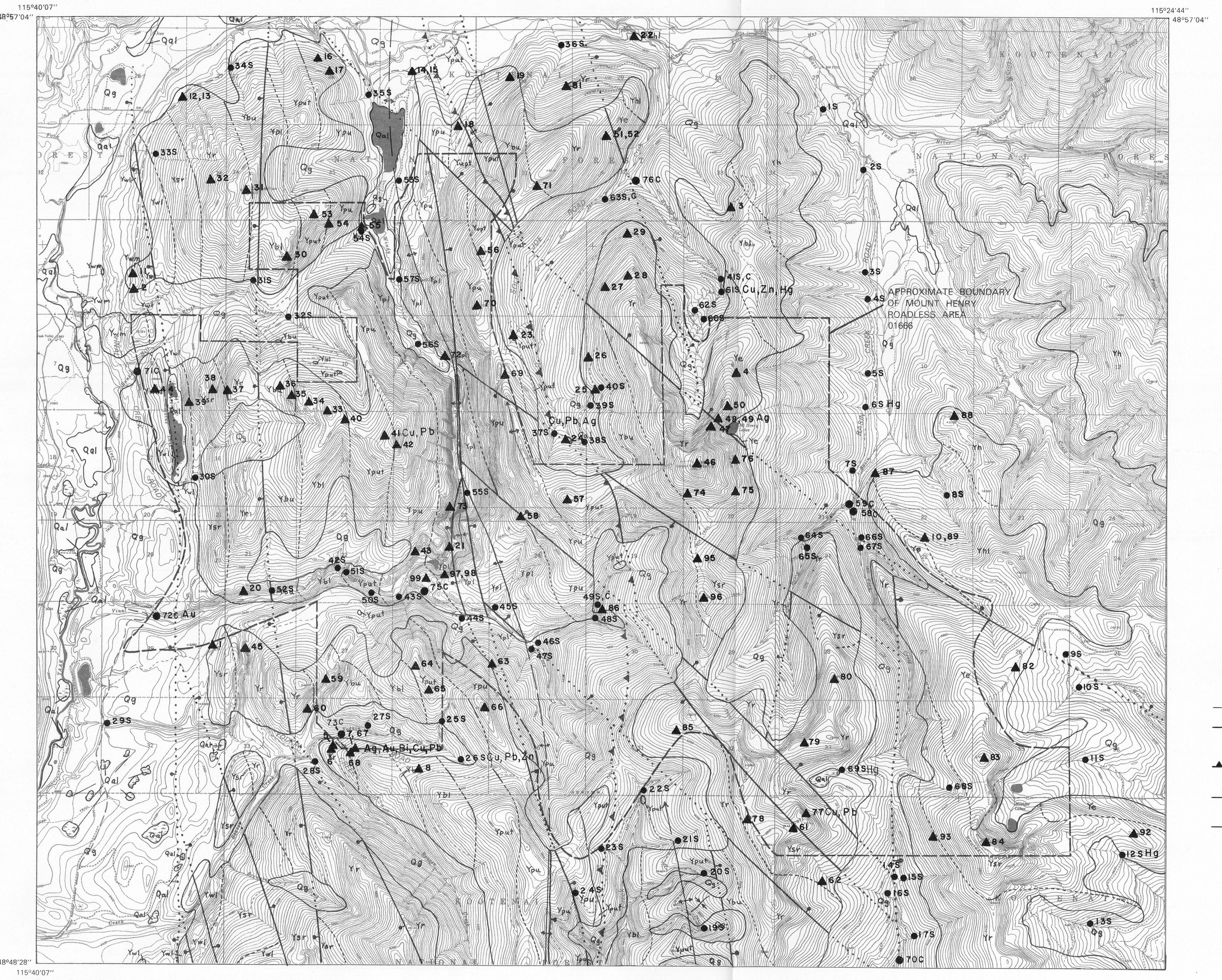
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1534-B



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

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

SCALE 1:50 000

CORRELATION OF MAP UNITS

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

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

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

Inclined

Overturned

▲45 Ag15 — ROCK SAMPLE LOCALITY--Showing anomalous element value in parts per million

●12 S Ag0.5 — STREAM-SEDIMENT SAMPLE LOCALITY--Showing anomalous element value in parts per million

●72C Au2.5 — 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 geochemical survey of the Mount Henry Roadless Area (RARE II 01-666) 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.

INTRODUCTION

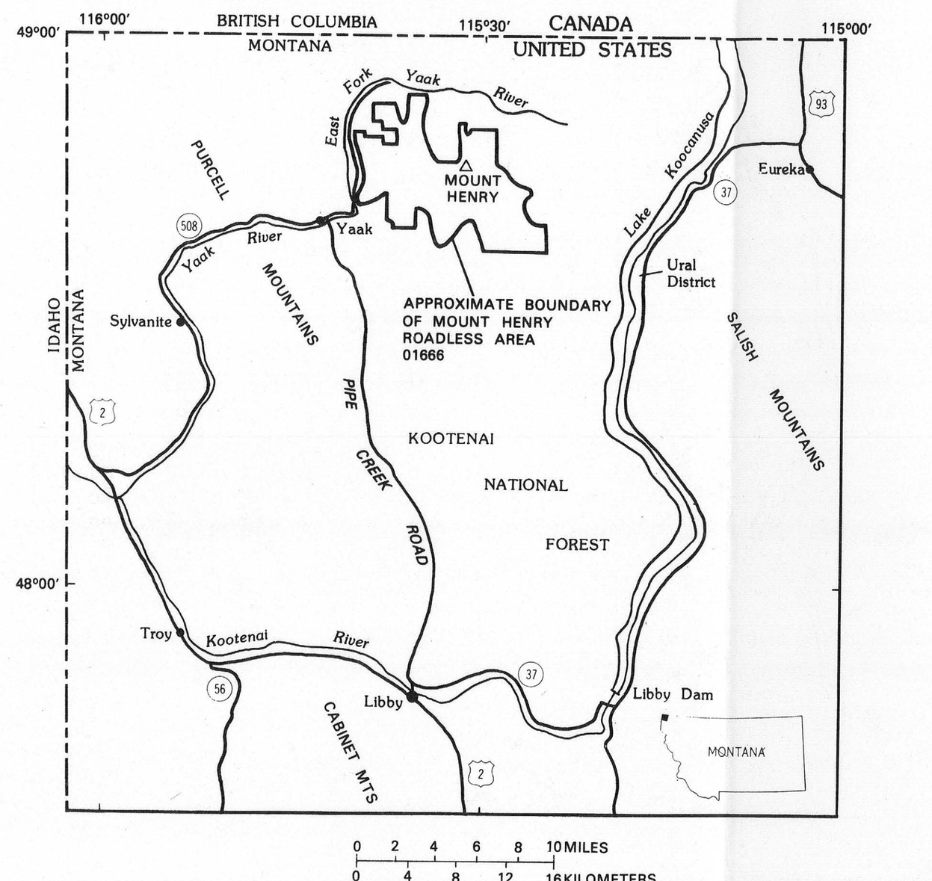
A geochemical survey was conducted in the Mount Henry Roadless Area, Kootenai National Forest, Lincoln County, Mont. by the U.S. Geological Survey during the summer of 1981.

The sampling and analytical programs were designed to locate mineralized zones in outcrops or in rocks buried at shallow depth. The geochemical results should be evaluated in context with geological and geophysical results. Possible types of mineralization, as judged from occurrences in nearby areas where the rocks are similar to those in the study area, include strata-bound copper-silver occurrences in rocks of the Ravalli Group, specifically the Burke and Revett Formations; the less probable lead-zinc massive sulfide deposits of the Sullivan-type in the pre-Ravalli (middle Prichard Formation); potential metal-enriched, sulfide vein systems; and gold-bearing veins or placer occurrences.

All samples collected for this study are plotted on the map. Element symbols shown at sample sites indicate an anomalous concentration for that element at the site. Tables 1-3 list the values of selected elements determined to be critical for a mineral evaluation of this particular geologic setting. All analytical results, including those selected for this report, are given in a U.S. Geological Survey Open-File report (Siems and others, 1983).

GEOLOGIC SETTING

The Mount Henry area is underlain by metasedimentary rocks of the middle and lower parts of the Belt Supergroup of Proterozoic age. The Belt rocks form a broad anticline that trends north. In general, the lower Belt rocks are exposed in the axial portion of the anticline near the central part of the area and the upper Belt rocks are exposed on the limbs of the fold in the east and west parts of the area. The rocks are cut by normal faults and a thrust fault that trend north to northwest.



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

RECONNAISSANCE GEOCHEMICAL MAP OF THE MOUNT HENRY ROADLESS AREA, LINCOLN COUNTY, MONTANA

By

David F. Siems, Reinhard W. Leinz, Richard E. Van Loenen, Gail A. Wadsworth, and Christine M. McDougal

1984

SAMPLING AND ANALYTICAL METHODS

Rocks, stream sediments, and panned concentrates of stream sediments were collected during the course of geologic and geochemical investigations and the samples were prepared and analyzed in the USGS laboratories in Golden, Colo. Ninety-five altered, unaltered, and mineralized rock samples were collected during geologic mapping. Several samples, representing typical rock types, were collected from each of the formations. Analytical results of the unaltered rocks (table 1) provide information on the background concentrations of the elements analyzed. Analytical results of altered and mineralized rock samples, collected along faults and from mineralized outcrops, help characterize anomalous areas and provide data for determining trace-element associations. Prior to analyses, the rocks were reduced to approximately 6-mm fragments in a jaw crusher, split with a Jones Splitter[1], and ground to approximately 0.1 mm in a vertical pulverizer equipped with ceramic plates.

Sixty-five stream-sediment samples were collected from active first-order and second-order streams. The sediment samples were air dried, and the portions that passed through a 0.18 mm screen were saved for analyses (table 2). Eleven panned concentrates of stream sediments were collected from nine of the major drainages in the area. After panning, the concentrates were air dried and passed through a 0.5 mm screen. The coarse fraction was discarded and magnetite was removed from the fine fraction with a hand magnet. One portion of the magnetite-free concentrate was analyzed for gold. Heavy minerals were removed from the remaining portion by bromoform (specific gravity 2.86) separation. The heavy minerals were split into a paramagnetic fraction, C2, and a nonmagnetic fraction, C3, using a Frantz Isodynamic Separator set at 0.6 amperes. The analytical results for selected elements in the C3 fractions are given in table 3.

All rocks, stream sediments, and C2 and C3 fractions of heavy mineral concentrates were analyzed for 31 elements (Fe, Mg, Ca, Ti, Mn, Ag, As, Au, B, Ba, Be, Bi, Cd, Co, Cr, Cu, La, Mo, Nb, Ni, Pb, Sb, Sc, Sn, Sr, Th, V, W, Y, Zn, and Zr) by a semiquantitative emission spectrographic method (Grimes and Marranzino, 1968). The precision of the spectrographic method is described by Motooka and Grimes (1976). The rocks and stream sediments were analyzed for mercury using an atomic-absorption modification of the technique of Vaughn and McCarthy (1964). Stream sediments were analyzed for zinc by atomic-absorption spectrometry (Ward and others, 1969), and the fractions of panned concentrates not run through the bromoform and magnetic separation were analyzed for gold (Thompson and others, 1968). Only two rock samples (VMH-7 and VMH-8), which contained detectable amounts of silver, were analyzed for gold.

Metals originating from a buried mineral deposit may migrate in ground water along fissures, fractures, and joints in outcrops or may be absorbed by clay minerals in the sediments of streams. The ability of iron and manganese oxides to scavenge these metals from solution and the use of trace metal analysis of the oxides as a method for detecting concealed mineral occurrences is described by Chao and Theobald (1976). All minus 0.18-mm fractions of stream-sediment and rock samples collected from the Prichard Formation were leached with oxalic acid, separating the iron and manganese oxide fractions that were analyzed by emission spectroscopy. The technique is described by Alminas and Mosier (1975). The same technique was applied to rocks of the Prichard Formation, which are ideally suited to the oxalic acid leach due to their high pyrrhotite and pyrite content. The sulfides oxidize along fractures and bedding planes producing a host or trap for base or precious metals that might be migrating in solution.

Discussion of results

Rock sample VMH-7, collected from a shear zone in the upper Burke Formation, contains copper (10,000 ppm), silver (20 ppm), bismuth (70 ppm), lead (150 ppm), and gold (0.6 ppm). Malachite coated the surface of the rock and bornite (Cu_5FeS_4) was identified in a thin section of this sample. Rock sample VMH-48, collected on a fault zone between the Revett Formation and basal Helena Formation contains silver (15 ppm). No other anomalous metal values were detected in this rock. Five other rock samples contain weakly anomalous concentrations of copper, and four samples contain weakly anomalous concentrations of lead. By inspection, a concentration of ≥70 ppm is considered anomalous for both elements in this study area. The highest concentration for either element is 100 ppm. Only samples VMH-77 and VMH-41, which are not visibly mineralized, contained anomalous concentrations for both copper and lead.

In the minus 0.18-mm stream sediments metal values of 70 ppm copper, 50 ppm lead, ≥0.24 ppm mercury, ≥100 ppm zinc, and detectable silver are considered anomalous. The total number of anomalous samples and maximum ppm values are as follows: 8 samples with anomalous copper, high value 70 ppm; 5 lead (50 ppm); 5 zinc (130 ppm); 4 mercury (0.4 ppm); and 13 silver (0.7 ppm). Only stream-sediment samples containing anomalous values for three or more of the above elements are discussed. Sample MH-61S, from Hudson Creek, which drains terrain underlain by the Revett and Helena Formations, contains weakly anomalous values of copper, mercury, and zinc. Rock sample VMH-48 (silver, 15 ppm) was collected from a fault zone that transects the basin upstream from this sediment sample site. Sample MH-37S, collected from the headwaters of Solo Joe Creek, contained anomalous values of copper, lead, and silver. Sample MH-26S, collected from Upper Yodkin Creek, which drains rocks of the Prichard and Burke Formations, contains weakly anomalous values of copper, lead, and zinc.

A single gold value of 2.5 ppm was detected in a panned concentrate, sample MH-72C, collected from Vinal Creek. The source of the gold is unknown. Sample MH-63C, from Solo Joe Creek, and sample MH-76C, from Hudson Creek, each contain 1 ppm silver in the C3 (nonmagnetic) fraction of the heavy-mineral concentrate. No other anomalous metal values are associated with the above silver values.

Due to the specificity of the oxalic acid leach towards iron-manganese oxides, weakly enhanced values for silver, copper, molybdenum, lead, tin, and zinc are observed in the oxalic leachate of the minus 0.18-mm fraction of stream sediment samples. No discernable geochemical pattern of these elements was observed. Such a small range of analytical values for the elements copper and lead in the oxide fraction indicates little or no contribution from significantly mineralized sources.

The oxalic acid leach of the rocks collected from the Prichard Formation shows a slight enhancement for the elements silver, copper, molybdenum, and lead in the oxide fraction. Sample VMH-73 ox and VMH-86 ox contain 10 ppm Ag, but low base-metal values. Sample VMH-72 ox contains 1,000 ppm Pb with no other significant metal values present.

Tourmaline, observed in thin sections of some rock samples, is probably responsible for boron values as high as 300 ppm in all media sampled.

The results of the geochemical survey of the Mount Henry Roadless Area indicate that weakly anomalous concentrations of metals are randomly scattered and do not define or indicate significant mineralized bodies.

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Vaughn, W. W., and McCarthy, J. H., Jr., 1964, An instrumental technique for the determination of submicrogram concentrations of mercury in soils, rocks, and gas, in Geological Survey research, 1964: U.S. Geological Survey Professional Paper 501-D, p. D123-D127.

Ward, F. N., Nakagawa, H. M., Harms, T. F., and Van Sickle, G. H., 1969, Atomic-absorption methods of analysis useful in geochemical exploration: U.S. Geological Survey Bulletin 1289, 45 p.

[1]Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

Table 1.--Analytical results of selected elements in rocks--Mount Henry Roadless Area.
[All values reported in parts per million. S = determined by emission spectroscopy; ox = oxalic acid leach (emission spectroscopy); N = not detected at value shown; L = detected but determined to be less than value shown; -- = not analyzed]

Sample No.	Ag s	Ag ox	B s	B ox	Cu s	Cu ox	Mo s	Mo ox	Pb s	Pb ox
VMH-1	N(.05)	--	200	--	N(5)	--	N(5)	--	20	--
VMH-2	N(.05)	--	150	--	N(5)	--	N(5)	--	15	--
VMH-3	N(.05)	--	100	--	20	--	N(5)	--	20	--
VMH-4	N(.05)	--	100	--	N(5)	--	N(5)	--	20	--
VMH-5	N(.05)	--	200	--	5	--	N(5)	--	30	--
VMH-6	N(.05)	--	70	--	50	--	N(5)	--	30	--
VMH-7[1]	20	--	150	--	10000	--	N(5)	--	150	--
VMH-8	N(.05)	--	150	--	50	--	N(5)	--	30	--
VMH-10	N(.05)	--	100	--	N(5)	--	N(5)	--	20	--
VMH-11	N(.05)	--	300	--	30	--	N(5)	--	20	--
VMH-12	N(.05)	--	30	--	10	--	N(5)	--	10	--
VMH-13	N(.05)	--	150	--	N(5)	--	N(5)	--	50	--
VMH-14	N(.05)	N(1)	150	50	30	10	N(5)	10	50	300
VMH-15	N(.05)	N(1)	20	20	50	100	N(5)	N(10)	100	500
VMH-16	N(.05)	N(1)	100	50	100	15	N(5)	N(10)	50	300
VMH-17	N(.05)	2	100	50	30	70	N(5)	30	50	500
VMH-18	N(.05)	N(1)	150	50	15	70	N(5)	50	30	300
VMH-19	N(.05)	--	150	--	5	--	N(5)	--	15	--
VMH-20	N(.05)	--	30	--	N(5)	--	N(5)	--	L(10)	--
VMH-21	N(.05)	--	50	--	5	--	N(5)	--	30	--
VMH-22	N(.05)	--	200	--	15	--	N(5)	--	20	--
VMH-23	N(.05)	--	70	--	30	--	N(5)	--	20	--
VMH-24	N(.05)	--	70	--	N(5)	--	N(5)	--	20	--
VMH-25	N(.05)	--	150	--	15	--	N(5)	--	15	--
VMH-26	N(.05)	--	200	--	N(5)	--	N(5)	--	20	--
VMH-27	N(.05)	--	300	--	7	--	N(5)	--	20	--
VMH-28	N(.05)	--	70	--	N(5)	--	N(5)	--	10	--
VMH-29	N(.05)	--	150	--	L(5)	--	N(5)	--	15	--
VMH-30	N(.05)	--	50	--	15	--	N(5)	--	20	--
VMH-31	N(.05)	--	100	--	N(5)	--	N(5)	--	20	--
VMH-32	N(.05)	--	150	--	N(5)	--	N(5)	--	50	--
VMH-33	N(.05)	--	70	--	30	--	N(5)	--	20	--
VMH-34	N(.05)	--	100	--	15	--	N(5)	--	30	--
VMH-35	N(.05)	--	100	--	30	--	N(5)	--	20	--
VMH-36	N(.05)	--	100	--	N(5)	--	N(5)	--	30	--
VMH-37	N(.05)	--	150	--	5	--	N(5)	--	20	--
VMH-38	N(.05)	--	70	--	N(5)	--	N(5)	--	50	--
VMH-39	N(.05)	--	100	--	N(5)	--	N(5)	--	10	--
VMH-40	N(.05)	--	100	--	20	--	N(5)	--	50	--
VMH-41	N(.05)	--	150	--	100	--	N(5)	--	70	--
VMH-42	N(.05)	N(1)	100	20	30	100	7	70	50	200
VMH-43	N(.05)	N(1)	150	50	30	200	N(5)	20	30	300
VMH-44	N(.05)	--	150	--	10	--	N(5)	--	10	--
VMH-45	N(.05)	--	50	--	20	--	N(5)	--	10	--
VMH-46	N(.05)	--	100	--	10	--	N(5)	--	20	--
VMH-47	N(.05)	--	100	--	N(5)	--	N(5)	--	15	--
VMH-48	15	--	70	--	7	--	N(5)	--	50	--
VMH-49	N(.05)	--	70	--	N(5)	--	N(5)	--	20	--
VMH-50	N(.05)	--	150	--	N(5)	--	N(5)	--	15	--
VMH-51	N(.05)	--	200	--	N(5)	--	N(5)	--	15	--
VMH-52	N(.05)	--	100	--	10	--	7	--	15	--
VMH-53	N(.05)	N(1)	100	50	50	300	L(5)	50	30	500
VMH-54	N(.05)	N(1)	200	30	15	200	N(5)	15	30	500
VMH-55	N(.05)	3	100	20	30	10	N(5)	N(10)	70	700
VMH-56	N(.05)	1	150	30	50	300	N(5)	20	50	500
VMH-57	N(.05)	--	100	--	30	--	N(5)	--	30	--
VMH-58	N(.05)	1.5	150	50	50	500	N(5)	N(10)	30	300
VMH-59	N(.05)	--	100	--	5	--	N(5)	--	50	--

Table 1.--Analytical results of selected elements in rocks--Mount Henry Roadless Area.--Continued

Sample No.	Ag s	Ag ox	B s	B ox	Cu s	Cu ox	Mo s	Mo ox	Pb s	Pb ox
VMH-60	N(.05)	--	100	--	50	--	N(5)	--	50	--
VMH-61	N(.05)	--	100	--	N(5)	--	N(5)	--	50	--
VMH-62	N(.05)	--	100	--	N(5)	--	N(5)	--	50	--
VMH-63	N(.05)	N(1)	100	50	50	500	7	70	50	500
VMH-64	N(.05)	N(1)	100	30	30	100	N(5)	10	20	200
VMH-65	N(.05)	--	100	--	100	--	N(5)	--	30	--
VMH-66	N(.05)	3	200	50	50	500	N(5)	15	50	500
VMH-67	N(.05)	--	200	--	5	--	N(5)	--	30	--
VMH-68	N(.05)	--	150	--	20	--	N(5)	--	30	--
VMH-69	N(.05)	N(1)	100	50	30	70	N(5)	N(10)	50	300
VMH-70	N(.05)	N(1)	150	50	50	300	N(5)	30	50	200
VMH-71	N(.05)	--	150	--	N(5)	--	N(5)	--	20	--
VMH-72	N(.05)	N(1)	70	50	L(5)	200	N(5)	N(10)	50	1000
VMH-73	N(.05)	10	100	50	7	100	N(5)	20	15	200
VMH-74	N(.05)	--	100	--	10	--	N(5)	--	20	--
VMH-75	N(.05)	--	150	--	10	--	N(5)	--	20	--
VMH-76	N(.05)	--	100	--	N(5)	--	N(5)	--	15	--
VMH-77	N(.05)	--	100	--	70	--	N(5)	--	70	--
VMH-78	N(.05)	--	100	--	N(5)	--	N(5)	--	50	--
VMH-79	N(.05)	--	70	--	30	--	N(5)	--	15	--
VMH-80	N(.05)	--	30	--	N(5)	--	N(5)	--	10	--
VMH-81	N(.05)	--	70	--	N(5)	--	N(5)	--	10	--
VMH-82	N(.05)	--	150	--	N(5)	--	N(5)	--	15	--
VMH-83	N(.05)	--	150	--	10	--	N(5)	--	15	--
VMH-84	N(.05)	--	150	--	70	--	N(5)	--	20	--
VMH-85	N(.05)	--	100	--	N(5)	--	N(5)	--	20	--
VMH-86	N(.05)	10	150	50	15	200	N(5)	10	20	300
VMH-87	N(.05)	--	200	--	N(5)	--	N(5)	--	15	--
VMH-88	N(.05)	--	20	--	5	--	N(5)	--	10	--
VMH-89	N(.05)	--	100	--	N(5)	--	N(5)	--	10	--
VMH-92	N(.05)	--	100	--	7	--	N(5)	--	20	--
VMH-93	N(.05)	--	70	--	20	--	N(5)	--	15	--
VMH-95	N(.05)	--	200	--	100	--	N(5)	--	50	--
VMH-96	N(.05)	--	150	--	50	--	N(5)	--	50	--
VMH-97	N(.05)	1	100	50	50	200	N(5)	10	15	150
VMH-98	N(.05)	1	150	20	70	150	5	70	20	200
VMH-99	N(.05)	2	150	20	70	300	N(5)	20	70	500

[1].60 ppm Au detected in VMH-7.

Table 2.--Analytical results of selected elements in 0.18 mm stream sediments, Mount Henry Roadless Area
[All values reported in parts per million. N = not detected at value shown; L = detected, but determined to be less than value shown. INS = insufficient sample. s = determined by emission spectroscopy, ox = oxalic acid leach (emission spectroscopy), aa = atomic absorption, and inst = instrumental Hg vapor detector]

Sample No.	Ag s	Ag ox	B s	B ox	Cu s	Cu ox	Mo s	Mo ox	Pb s	Pb ox	Sn s	Sn ox	Zn s	Zn aa	Hg inst
MH-001-S	N(0.5)	N(1)	70	50	20	200	N(5)	N(10)	20	300	N(10)	N(20)	N(200)	60	.08
MH-002-S	N(0.5)	N(1)	70	70	20	200	N(5)	N(10)	10	150	N(10)	50	N(200)	60	.06
MH-003-S	N(0.5)	N(1)	70	50	20	200	N(5)	10	10	200	N(10)	N(20)	N(200)	60	.08
MH-004-S	L(0.5)	N(1)	100	50	30	300	N(5)	L(10)	30	500	N(10)	N(20)	N(200)	65	.10
MH-005-S	N(0.5)	N(1)	50	70	30	300	N(5)	15	15	500	N(10)	20	N(200)	50	.14
MH-006-S	N(0.5)	N(1)	50	100	30	200	N(5)	15	10	500	N(10)	L(20)	N(200)	50	.4
MH-007-S	N(0.5)	N(1)	50	100	50	200	N(5)	10	10	300	N(10)	N(20)	N(200)	75	.14
MH-008-S	L(0.5)	N(1)	70	30	50	300	N(5)	N(10)	30	300	N(10)	N(20)	N(200)	70	.10
MH-009-S	.5	N(1)	30	20	70	150	N(5)	N(10)	20	200	N(10)	N(20)	N(200)	50	.10
MH-010-S	N(0.5)	N(1)	50	50	30	300	N(5)	10	15	500	N(10)	20	N(200)	70	.12
MH-011-S	N(0.5)	N(1)	50	100	30	300	N(5)	10	15	500	N(10)	20	N(200)	70	.12
MH-012-S	.5	N(1)	50	70	50	300	N(5)	10	20	500	N(10)	N(20)	N(200)	60	.24
MH-013-S	N(0.5)	N(1)	30	100	20	300	N(5)	20	20	500	N(10)	30	N(200)	50	.08
MH-014-S	N(0.5)	N(1)	30	100	30	500	N(5)	15	20	500	N(10)	N(20)	N(200)	35	.08
MH-015-S	L(0.5)	N(1)	30	100	30	500	N(5)	20	15	500	N(10)	50	N(200)	60	.08
MH-016-S	N(0.5)	N(1)	30	50	30	300	N(5)	15	20	500	N(10)	30	N(200)	60	.06
MH-017-S	N(0.5)	2	50	50	15	500	N(5)	15	10	500	N(10)	50	N(200)	30	.04
MH-019-S	N(0.5)	N(1)	30	50	30	200	N(5)	15	30	500	N(10)	N(20)	N(200)	50	.08
MH-020-S	N(0.5)	2	70	500	20	300	N(5)	30	20	700	N(10)	50	N(200)	60	.08
MH-021-S	N(0.5)	3	100	200	30	150	N(5)	L(10)	20	200	N(10)	L(20)	N(200)	INS	.10
MH-022-S	N(0.5)	N(1)	70	500	30	200	N(5)	10	20	300	N(10)	N(20)	N(200)	55	.08
MH-023-S	L(0.5)	N(1)	10	200	30	300	N(5)	15	20	500	N(10)	N(20)	N(200)	130	.14
MH-024-S	N(0.5)	2	70	150	20	300	N(5)	20	50	700	N(10)	N(20)	N(200)	110	.14
MH-025-S	N(0.5)	N(1)	30	50	50	200	N(5)	10	15	300	N(10)	N(20)	N(200)	95	.06
MH-026-S	N(0.5)	N(1)	50	50	70	300	N(5)	20	50	300	N(10)	N(20)	N(200)	100	.10
MH-027-S	N(0.5)	N(1)	70	30	50	300	N(5)	N(10)	50	500	N(10)	N(20)	N(200)	45	.06
MH-028-S	N(0.5)	N(1)	70	30	50	200	N(5)	N(10)	30	500	N(10)	N(20)	N(200)	60	.06
MH-029-S	N(0.5)	N(1)	20	200	50	300	N(5)	N(10)	10	500	N(10)	N(20)	N(200)	130	.08
MH-030-S	N(0.5)	N(1)	70	30	50	300	N(5)	N(10)	20	500	N(10)	20	N(200)	55	.06
MH-031-S	N(0.5)	N(1)	30	100	50	500	N(5)	10	20	500	N(10)	N(20)	N(200)	70	.16
MH-032-S	N(0.5)	N(1)	50	70	50	300	N(5)	10	30	500	N(10)	20	N(200)	90	.06
MH-033-S	N(0.5)	N(1)	50	200	30	500	N(5)	10	15	500	N(10)	N(20)	N(200)	45	.06
MH-034-S	N(0.5)	2	100	100	10	300	N(5)	15	10	500	N(10)	N(20)	N(200)	50	.04
MH-035-S	N(0.5)	N(1)	100	100	50	300	N(5)	L(10)	20	500	N(10)	N(20)	N(200)	65	.04
MH-036-S	N(0.5)	N(1)	100	50	20	200	N(5)	N(10)	15	300	N(10)	N(20)	N(200)	55	.04
MH-037-S	.5	N(1)	70	30	70	200	N(5)	N(10)	50	500	N(10)	L(20)	N(200)	65	.08
MH-038-S	N(0.5)	N(1)	100	100	30	300	N(5)	L(10)	30	500	N(10)	N(20)	N(200)	55	.08
MH-039-S	N(0.5)	N(1)	100	100	20	200	N(5)	L(10)	10	500	N(10)	N(20)	N(200)	40	.12
MH-040-S	.5	N(1)	50	150	70	500	N(5)	L(10)	30	500	N(10)	N(20)	N(200)	50	.12
MH-041-S	N(0.5)	N(1)	70	100	70	500	N(5)	10	30	500	N(10)	N(20)	N(200)	60	.14
MH-042-S	N(0.5)	N(1)	50	150	50	300	N(5)	15	20	500	N(10)	N(20)	N(200)	75	.12
MH-043-S	.7	1.5	20	100	30	500	N(5)	L(10)	15	500	N(10)	N(20)	N(200)	35	.14
MH-044-S	N(0.5)	N(1)	20	100	50	500	N(5)	N(10)	15	500	N(10)	N(20)	N(200)	85	.08
MH-045-S	N(0.5)	N(1)	70	70	50	300	N(5)	10	15	500	N(10)	N(20)	N(200)	60	.04
MH-046-S	N(0.5)	N(1)	50	100	30	300	N(5)	15	30	500	N(10)	N(20)	N(200)	75	.06
MH-047-S	N(0.5)	N(1)	70	100	50	300	N(5)	10	20	500	N(10)	N(20)	N(200)	55	.06
MH-048-S	L(0.5)	N(1)	50	150	50	300	N(5)	20	30	500	N(10)	N(20)	N(200)	45	.16
MH-049-S	N(0.5)	2	70	700	30	300	N(5)	10	20	500	N(10)	N(20)	N(200)	55	.04
MH-050-S	L(0.5)	N(1)	70	100	70	500	N(5)	N(10)	30	500	N(10)	N(20)	N(200)	95	.08
MH-051-S	N(0.5)	N(1)	70	200	50	500	N(5)	L(10)	20	700	N(10)	N(20)	N(200)	85	.16
MH-052-S	N(0.5)	N(1)	100	50	30	300	N(5)	N(10)	20	500	N(10)	N(20)	N(200)	45	.04
MH-053-S	N(0.5)	N(1)	70	100	50	300	N(5)	15	15	500	N(10)	N(20)	N(200)	70	.04
MH-054-S	N(0.5)	N(1)	50	70	30	200	N(5)	L(10)	10	500	N(10)	N(20)	N(200)	65	.06
MH-055-S	N(0.5)	N(1)	50	200	30	300	N(5)	L(10)	50	500	N(10)	N(20)	N(200)	90	.02
MH-056-S	.5	N(1)	70	70	50	300	N(5)	10	20	500	N(10)	N(20)	N(200)	50	.16
MH-057-S	N(0.5)	N(1)	50	100	70	700	N(5)	15	20	500	N(10)	N(20)	N(200)	75	.08
MH-060-S	N(0.5)	N(1)	50	50	20	300	N(5)	20	15	700	N(10)	N(20)	N(200)	40	.10
MH-061-S	N(0.5)	N(1)	30	100	70	500	N(5)	N(10)	20	500	N(10)	N(20)	N(200)	110	.24
MH-062-S	N(0.5)	N(1)	100	70	20	200	N(5)	N(10)	15	500	N(10)	N(20)	N(200)	55	.04
MH-064-S	N(0.5)	N(1)	50	200	30	500	N(5)	15	15	700	N(10)	30	N(200)	50	.10
MH-065-S	N(0.5)	N(1)	20	200	20	300	N(5)	30	10	500	N(10)	20	N(200)	40	.10
MH-066-S	.5	N(1)	100	150	50	300	N(5)	N(20)	30	300	N(10)	N(20)	N(200)	60	.08
MH-067-S	N(0.5)	N(1)	30	150	20	300	N(5)	20	10	500	N(10)	N(20)	N(200)	55	.10
MH-068-S	N(0.5)	N(1)	50	150	50	300	N(5)	L(10)	20	700	N(10)	N(20)	N(200)	45	.10
MH-069-S	N(0.5)	N(1)	30	500	30	500	N(5)	15	15	1000	N(10)	100	N(200)	60	.24

Table 3.--Analytical values for selected elements in the C3 (nonmagnetic) fraction heavy-mineral separates of panned concentrates, Mount Henry Roadless Area
[All values reported in parts per million. S = determined by emission spectroscopy; N = not detected at value shown; L = detected but determined to be less than value shown.]

Sample No.	Ag	B	Cu	Pb
MH-41-C3	N(1)	150	15	20
MH-49-C3	N(1)	150	15	20
MH-58-C3	N(1)	150	10	20
MH-59-C3	N(1)	100	L(10)	L(20)
MH-63-C3	1	2000	N(10)	L(20)
MH-70-C3	N(1)	100	L(10)	20
MH-71-C3	N(1)	200	N(10)	20
MH-72[1]-C3	N(1)	200	N(10)	30
MH-73-C3	N(1)	200	L(10)	30
MH-75-C3	N(1)	200	L(10)	30
MH-76-C3	1	500	10	30

[1] 2.5 ppm Au detected in raw concentrate MH-72 C.

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