UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

Analyses and descriptions of geochemical samples, OTTER CREEK WILDERNESS, Randolph and Tucker Counties, West Virginia

By David Siems, A.L. Meier, and Nancy A. Wright

OPEN-FILE REPORT 81-352

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards.

1981

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ABSTRACT

Semiquantitative spectrographic analyses for 31 elements and atomic-absorption analyses for zinc on 86 bulk stream-sediment samples and 43 rock samples from the Otter Creek Wilderness, and vicinity, Randolph and Tucker Counties, West Virginia, are reported here in detail. Locations for all samples are given in Universal Transverse Mercator (UTM) coordinates. Brief descriptions of rock samples are also included. Rocks analyzed include siltstone, sandstone, shale, and limestone.

The data contain no obviously anomalous values that might be related to mineralized rock.

INTRODUCTION

The analyses reported in this open-file report are of samples from the Otter Creek Wilderness and vicinity, Randolph and Tucker Counties, W.Va., collected by N. A. Wright, K. M. Kozey, C. L. Neeley, E. E. Good, and C. M. Shifflett in October and November 1977.

The samples are 86 bulk stream sediments from the Otter Creek Wilderness and vicinity and 43 rocks. The rock samples are described briefly below. All rock samples are chip samples of representative material collected from outcrop or roadcuts. Some of the rock is partly weathered, as noted in the descriptions, but the freshest material available was generally sampled. Sample location maps and discussion of the results are given by Wright (in press), and coordinates of the sample locations are given in tables 1 and 2 of this report.

The area is underlain by a thick sequence of Mississippian and Pennsylvanian sedimentary rocks.

ANALYTICAL TECHNIQUES

Rock samples were crushed to approximately 0.25 inch (6 mm) and pulverized to minus 140-mesh (0.105 mm) in a vertical grinder having ceramic plates. Stream sediments were dried and sieved to minus 80-mesh (0.177 mm) and then pulverized.

Each sample was analyzed semiquantitatively for 31 elements by a six-step, D.C. (direct-current) arc, optical emission spectrographic method (Grimes and Marranzino, 1968). In addition, each sample was analyzed by an atomic-absorption technique for zinc (Ward and others, 1969, p. 20).

The semiquantitative spectrographic values are reported as six steps per order of magnitude (1, 0.7, 0.5, 0.3, 0.2, 0.15, or multiples of 10 times these numbers) and are approximate geometric midpoints of the concentration ranges. The precision was shown by Motooka and Grimes (1976) to be within one adjoining reporting interval on each side of the reported value 83 percent of the time and within two adjoining intervals 96 percent of the time.

ROCK SAMPLE DESCRIPTIONS

Sample No.	Description
WVO 003	1.5 m, chip sample, black sandstone, heavily iron stained, New River and Kanawha Formations, undivided (Pennsylvanian).
WVO 004	1 m, chip sample, sandy siltstone, olive, Mauch Chunk Formation (Mississippian).

WVO 005 - 1 m, chip sample, greenish-gray, fine-grained sandstone, Mauch Chunk Formation.

WVO 006 - 1 m, chip sample, brownish-black shale - New River and Kanawha Formations, undivided.

WVO 007 - 1 m, chip sample, black shale, weathering brown, New River and Kanawha Formations, undivided.

WVO 008 - 1.5 m, chip sample, gray sandy siltstone, New River and Kanawha Formations, undivided.

WVO 009 - 1 m, chip sample, green shale, Mauch Chunk Formation.

WVO 010 - 1 m, chip sample, gray limestone, Mauch Chunk Formation.

WVO 015 - 1m , chip sample, gray limestone, Greenbrier Limestone (Mississippian).

WVO 034 - 1 m, chip sample, gray limestone overlain by crossbedded sandstone and shale, Greenbrier Limestone.

WVO 102 - 0.6 m, chip sample, fine-grained brown sandstone and slate chips, Mauch Chunk Formation.

WVO 103 - 1 m, chip sample, brown fine-grained sandstone, weathered, New River and Kanawha Formations, undivided.

WVO 104 - 1 m, chip sample, thin-bedded brown sandstone, weathered, New River and Kanawha Formations, undivided.

WVO 105 - 1 m, chip sample, thick-bedded highly weathered conglomerate. Sandstone containing quartz pebbles, New River and Kanawha Formations, undivided.

WVO 106 - 1 m, chip sample, massive sandstone, olive gray to medium gray, New River and Kanawha Formations, undivided.

WVO 107 - 1 m, chip sample, thick-bedded gray-brown massive sandstone, New River and Kanawha Formations, undivided.

WVO 108 - 1 m, chip sample, red shale Mauch Chunk Formation.

WVO 109 - 1 m, chip sample, same section as WVO 108, thin green shale lens in red shale beds, Mauch Chunk Formation.

WVO 110 - 0.3 m, chip sample, grayish-red sandstone, very fine grained, Mauch Chunk Formation.

WVO 111 - 1 m, chip sample, limestone, light olive gray, very fine to fine grained, Mauch Chunk Formation.

WVO 112 - 1 m, chip sample, light-olive-gray limestone, fine grained, Mauch Chunk Formation

WVO 113 - 1 m, chip sample, light-olive-gray limestone, very fine to fine grained, Mauch Chunk Formation.

WVO 136 - 1 m, chip sample, red shale and some green beds, Mauch Chunk Formation.

WVO 137 - 1 m, chip sample, red shales that do not have bedding. This unit is immediately below WVO 136, Mauch Chunk Formation.

WVO 140 - 1 m, chip sample, greenish-gray sandy shale, highly weathered, even beds, Mauch Chunk Formation.

WVO 142 - 1 m, chip sample, red shale, bedded, Mauch Chunk Formation.

WVO 202 - 1 m, chip sample, dark-gray clayey shale, irregular fractures, New River and Kanawha Formations, undivided.

WVO 203 - 1 m, chip sample, thin-bedded brown sandstone, fine grained, clay fragments, New River and Kanawha Formations, undivided.

WVO 204 - 2 m, chip sample, interlayered brown sandstone and conglomerate, New River and Kanawha Formations, undivided.

WVO 205 - 1 m, shale, grayish red, calcareous, few beds greenish-gray shale, Mauch Chunk Formation.

WVO 206 - 1 m, chip sample limestone, light olive gray, very fine to finely crystalline, crinoid Greenbrier Limestone.

WVO 207 - 1 m, chip sample limestone, light olive gray, very finely crystalline, argillaceous, abundant crinoid stems, Greenbrier Limestone.

WVO 208 - 1 m, chip sample limestone, light olive gray, fine to medium crystalline, clastic, Greenbrier Limestone.

WVO 209 - 1 m, chip sample, very fine grained, light-brownish limestone, Greenbrier Limestone.

WVO 210 - 1 m, chip sample, limestone weathering yellowish tan, Greenbrier Limestone.

WVO 302 - 1 m, chip sample, reddish sandy shale, Mauch Chunk Formation.

WVO 401 - 1.5 m, chip sample, medium-gray silty sandy shale, Greenbrier Limestone.

WVO 402 - 1 m, chip sample, dense gray limestone interbedded with rusty brown siltstone, Greenbrier Limestone.

WVO 406 - 1 m, chip sample, shaley limestone, Greenbrier Limestone.

WVO 408 - 1 m, chip sample, sandy shale, Mauch Chunk Formation.

WVO 409 - 1 m, chip sample reddish sandy siltstone, Mauch Chunk Formation.

WVO 410 - 1 m, chip sample, shaley limestone, Greenbrier Limestone.

WVO 413 - 1 m, chip sample, greenish-gray to rusty sandstone, New River and Kanawha Formations, undivided.

EXPLANATION OF TABLES 1 AND 2

Tables 1 and 2 show the results of geochemical analyses of stream-sediment samples and rock samples from the Otter Creek Wilderness. Sample locations are given in x and y coordinates that refer to the Universal Transverse Mercator (UTM) grid, zone 17. The x coordinate is the easting value in meters; the y is the northing value in meters.

Iron, magnesium, calcium, and titanium contents are reported in percent; all others are in parts per million. Letters preceding and following chemical symbols indicate the method of analysis: S, six-step semiquantitative spectrographic method; AA, atomic absorption; P, partial solution. Other symbols on the tables are: N, not detected; <, amount detected is below the lowest limit of determination; and >, amount detected is above the highest limit of determination.

Elements looked for spectrographically but not found, and their lower limits of determination (in parts per million), are: As (200); Au (10); Bi (10); Cd (20); Sb (100); Th (100); W (50); and Zn (200). Ag was found only in WVO 312 and WVO 412; its lower limit of determination was 0.5 ppm, and 0.5 ppm Ag was reported for each of these samples.

All analyses were performed by David Siems and A. L. Meier.

REFERENCES CITED

Grimes, D.J., and Marranzino, A. P., 1968, Direct-current arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.

Motooka, J. M., and Grimes, D. J., 1976, Analytical precision of one-sixth order semiquantitative spectrographic analysis: U.S. Geological Survey Circular 738, 25 p.

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

Wright, N. A., in press, Reconnaissance geochemistry of the Otter Creek Wilderness, Randolph and Tucker Counties, West Virginia: U.S. Geological Survey Miscellaneous Field Studies Map MF-1267-B, 1 sheet.

Table 1.--Stream-Sediment Samples - Geochemical Analyses - Otter Creek Wilderness

sample	X-COORD.	Y-COORD.	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-B	S-BA	S-BE	S-CO	S-CR	S-CU	S-LA	S-MO
WV0001	615,300	4,311,040	3.0	.50	<.05	.30	<10	30	200	N	5	150	15	20	N
WV0002	615,180	4,311,760	.5	.05	N	.20	<10	30	200	N	<5	15	<5	N	N
WV0011	615,820	4,312,200	.2	.20	<.05	.20	700	30	20	N	<5	10	N	<20	N
WV0012	616,640	4,313,020	2.0	.07	N	.30	<10	50	20	N	20	70	7	20	N
WV0013	617,100	4,314,000	.2	.20	<.05	.20	<10	20	150	N	<5	100	N	N	N
WV0014	618,540	4,314,260	2.0	.02	<.05	.30	50	50	100	N	5	70	5	20	N
WV0016	619,980	4,313,600	5.0	.70	.30	.30	500	70	200	<1.0	15	70	30	20	N
WV0017	620,030	4,313,700	5.0	.70	.30	.30	300	50	300	1.0	15	100	30	20	N
WV0018	614,400	4,317,660	1.0	.10	<.05	.30	10	30	100	N	<5	30	N	20	N
WV0019	614,740	4,317,780	.7	.05	N	.30	20	50	70	N	<5	20	N	20	N
WV0020	615,920	4,317,540	.5	.50	N	.30	<10	30	70	N	<5	50	N	<20	N
WV0021	613,100	4,312,460	2.0	.50	.30	.30	300	30	200	<1.0	10	70	30	50	N
WV0022	613,920	4,312,680	5.0	.15	<.05	.50	150	100	300	<1.0	5	150	30	20	<5
WV0023	614,960	4,313,020	1.0	.30	<.05	.50	20	70	100	<1.0	7	70	N	20	N
WV0024	613,900	4,310,940	3.0	.50	.05	.50	70	70	150	<1.0	20	70	20	<20	N
WV0025	619,800	4,321,880	2.0	.70	<.05	.20	100	50	150	N	10	100	30	50	N
WV0026	616,660	4,321,910	1.5	.30	.50	.50	300	100	300	<1.0	15	150	30	20	5
WV0027	616,680	4,322,020	3.0	.70	.20	.30	500	50	300	N	20	100	20	30	N
WV0028	616,400	4,322,210	5.0	.50	.50	.30	1,000	100	300	1.0	20	150	50	50	N
WV0029	616,460	4,321,680	5.0	.70	.07	.50	300	100	300	<1.0	10	150	50	50	5
WV0030	616,380	4,321,480	3.0	.30	.20	.30	700	100	300	<1.0	5	70	50	<20	<5
WV0031	616,300	4,321,190	5.0	.50	.10	.20	500	30	200	<1.0	15	70	20	20	N
WV0032	616,420	4,320,240	5.0	.70	<.05	.50	100	70	150	<1.0	10	150	20	20	N
WV0033	616,820	4,320,180	2.0	.50	.15	.30	1,500	50	300	<1.0	10	70	50	20	<5
WV0035	617,450	4,321,960	1.5	.30	.20	.30	500	30	300	<1.0	7	50	20	<20	N
WV0036	621,960	4,315,530	2.0	.30	.10	.30	500	30	200	<1.0	10	100	20	<20	N
WV0037	621,810	4,315,210	7.0	.50	.20	.30	500	50	300	<1.0	20	200	20	<20	N
WV0039	619,680	4,320,880	7.0	1.00	.07	.30	700	70	300	<1.0	10	100	50	50	N
WV0040	617,800	4,317,280	7.0	.70	.05	.20	50	30	100	N	<5	100	5	N	<5
WV0101	615,820	4,309,140	3.0	.30	.05	.30	2,000	20	200	1.0	30	70	20	20	N
WV0114	616,340	4,310,460	2.0	.30	.05	.20	2,000	20	150	1.0	50	50	10	30	N
WV0115	615,930	4,310,640	1.5	.20	<.05	.20	50	20	100	<1.0	<5	30	<5	20	N
WV0116	615,720	4,308,540	2.0	.50	.10	.30	1,000	30	200	1.5	20	100	15	70	N
WV0117	618,210	4,310,230	5.0	1.00	.30	.30	1,500	50	150	1.0	15	100	20	50	5
WV0118	619,360	4,311,800	1.5	.50	.10	.20	300	100	100	<1.0	7	50	10	<20	N
WV0119	620,140	4,312,760	1.5	.20	<.05	.15	500	100	300	N	7	30	5	<20	N
WV0120	620,230	4,312,660	1.5	.30	.10	.30	700	50	100	<1.0	10	50	15	20	N
WV0121	620,550	4,313,120	2.0	.15	<.05	.20	300	10	300	N	7	50	5	<20	N
WV0122	620,520	4,313,240	3.0	.50	.20	.30	200	50	100	1.0	20	70	20	30	N
WV0123	613,750	4,319,000	1.5	.15	<.05	.15	700	10	300	<1.0	15	50	10	<20	N
WV0124	613,995	4,320,440	2.0	.50	.07	.20	300	20	300	<1.0	10	50	50	20	N
WV0125	615,400	4,321,890	2.0	.70	.20	.30	1,000	70	500	1.0	10	100	20	20	N
WV0126	615,270	4,323,590	5.0	.50	.50	.30	500	70	100	1.0	15	100	20	30	N
WV0127	612,400	4,312,460	1.5	1.00	N	.30	1,000	70	150	1.0	7	150	50	50	N
WV0128	614,090	4,312,980	1.5	.10	<.05	.30	70	20	100	N	7	70	5	20	N

Table 1.-- Stream-Sediment Samples - Geochemical Analyses - Otter Creek Wilderness -- Continued

sample	S-NB	S-NI	S-PB	S-SC	S-SN	S-SR	S-V	S-Y	S-ZR	AA-ZN-P
WV0001	<20	15	20	5	N	N	70	20	300	20
WV0002	N	5	10	5	N	N	15	<10	700	5
WV0011	N	5	<10	5	10	N	15	<10	500	N
WV0012	N	7	15	5	<10	N	30	15	100	20
WV0013	N	5	<10	5	<10	N	10	<10	500	N
WV0014	<20	5	10	5	N	N	30	15	50	20
WV0016	<20	30	30	7	N	<100	70	20	200	90
WV0017	<20	50	20	7	N	N	70	20	300	120
WV0018	<20	<5	10	<5	N	N	50	10	70	10
WV0019	<20	5	<10	<5	N	N	20	<10	100	10
WV0020	N	<5	<10	5	N	N	20	10	500	5
WV0021	N	20	15	7	N	<100	70	10	70	95
WV0022	<20	15	50	10	<10	<100	100	20	300	35
WV0023	<20	5	15	5	N	<100	50	15	700	10
WV0024	<20	10	30	5	20	<100	70	15	200	20
WV0025	N	15	20	5	<10	N	50	10	150	140
WV0026	<20	50	30	10	N	100	100	20	300	60
WV0027	N	20	10	5	N	N	50	10	200	50
WV0028	<20	50	30	10	N	<100	70	30	500	80
WV0029	<20	30	30	10	N	<100	100	20	300	50
WV0030	<20	50	50	10	<10	<100	100	20	200	60
WV0031	N	50	15	5	N	<100	50	10	150	75
WV0032	<20	10	20	7	N	<100	70	20	500	30
WV0033	N	20	30	7	10	<100	70	20	200	80
WV0035	N	30	20	5	N	<100	50	10	300	70
WV0036	N	10	15	5	N	N	50	10	300	75
WV0037	<20	20	15	5	N	N	70	10	300	70
WV0039	<20	50	20	15	<10	100	150	30	200	80
WV0040	N	5	10	5	N	N	50	<10	70	30
WV0101	<20	30	20	5	N	N	70	30	1,000	55
WV0114	<20	20	20	<5	N	N	50	15	700	120
WV0115	<20	5	10	<5	20	N	30	15	1,000	25
WV0116	<20	30	20	7	N	<100	70	30	700	180
WV0117	<20	30	30	10	N	100	70	10	300	110
WV0118	N	10	10	<5	N	N	50	<10	150	70
WV0119	N	10	10	<5	N	N	20	30	200	90
WV0120	<20	30	30	7	N	<100	70	10	300	60
WV0121	N	10	10	5	N	N	30	20	700	70
WV0122	<20	50	30	7	N	<100	100	<10	300	110
WV0123	N	30	15	<5	N	N	20	20	150	85
WV0124	N	30	20	5	N	N	50	20	200	80
WV0125	<20	30	20	5	N	<100	50	20	300	110
WV0126	<20	30	20	7	N	N	70	30	300	50
WV0127	<20	30	50	15	<10	100	150	10	200	80
WV0128	<20	10	15	5	N	N	30	10	500	40

Table 1.--Stream-Sediment Samples - Geochemical Analyses - Otter Creek Wilderness -- Continued

sample	X-COORD.	Y-COORD.	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-B	S-BA	S-BE	S-CO	S-CR	S-CU	S-LA	S-MO
WV0129	622,200	4,314,400	1.0	.20	<.05	.20	200	20	100	N	5	50	7	<20	N
WV0130	621,520	4,314,400	1.5	.20	<.05	.20	50	10	100	N	7	50	5	<20	N
WV0131	620,770	4,313,660	1.0	.30	.05	.20	300	20	200	<1.0	10	50	10	<20	N
WV0132	620,250	4,322,050	1.5	.50	.20	.30	700	50	200	<1.0	7	70	15	30	N
WV0133	613,700	4,321,450	2.0	.30	.15	.30	500	50	200	N	10	50	10	20	N
WV0134	613,400	4,321,380	2.0	.50	.10	.30	1,000	50	200	N	10	50	15	20	N
WV0135	613,620	4,321,770	1.5	.20	<.05	.20	300	10	150	N	7	15	5	N	N
WV0138	614,530	4,322,525	3.0	.70	.15	.30	1,500	50	300	N	15	70	30	20	N
WV0139	615,050	4,322,780	1.5	.50	.05	.30	200	15	150	N	7	50	5	N	N
WV0141	615,830	4,324,070	2.0	.50	.15	.30	300	15	200	N	7	30	7	N	N
WV0143	617,840	4,315,930	2.0	.30	N	.30	20	20	150	N	5	70	5	<20	N
WV0144	617,890	4,316,380	3.0	.30	N	.30	70	20	150	N	5	70	5	N	<5
WV0145	617,300	4,318,470	3.0	.50	<.05	.30	2,000	30	200	N	50	70	20	20	<5
WV0201	615,160	4,310,820	2.0	.15	N	.20	<10	15	100	N	5	50	<5	N	<5
WV0211	615,770	4,312,080	2.0	.15	<.05	.30	20	15	150	N	7	70	5	<20	N
WV0212	615,770	4,312,080	1.0	.07	N	.20	20	15	20	N	<5	30	<5	N	N
WV0213	617,940	4,314,210	2.0	.20	<.05	.30	<10	15	20	N	<5	150	<5	<20	<5
WV0214	614,080	4,317,720	.5	.07	N	.20	<10	30	70	N	<5	50	<5	N	N
WV0215	615,150	4,317,410	.2	.02	N	.20	<10	15	70	N	<5	500	<5	N	N
WV0216	613,540	4,312,580	3.0	.70	<.05	.30	3,000	30	20	N	50	100	30	30	<5
WV0217	617,960	4,322,160	2.0	.50	.05	.30	300	30	300	N	10	70	15	N	N
WV0301	616,300	4,322,650	2.0	.30	.20	.20	300	15	300	N	10	70	10	<20	N
WV0303	617,830	4,323,020	7.0	1.00	.05	.50	3,000	20	300	<1.0	50	100	50	30	<5
WV0304	616,370	4,324,140	2.0	.50	.15	.20	300	10	200	N	10	50	7	N	N
WV0305	618,040	4,325,480	1.5	.30	.10	.20	100	10	150	N	5	70	5	N	N
WV0306	618,910	4,325,260	2.0	.70	.30	.30	700	20	200	N	10	50	7	<20	N
WV0308	620,840	4,313,970	3.0	.70	.50	.30	1,000	30	300	1.0	10	50	10	<20	N
WV0309	622,010	4,315,140	3.0	.70	.20	.30	1,500	50	300	<1.0	15	50	20	20	N
WV0310	621,880	4,315,130	1.5	.30	.05	.20	700	20	150	<1.0	7	30	5	N	N
WV0311	619,910	4,321,020	5.0	.50	.05	.50	300	30	200	<1.0	7	100	30	50	5
WV0312	619,850	4,321,060	7.0	.70	.10	.50	500	50	500	1.0	10	200	50	70	5
WV0403	616,320	4,322,220	7.0	1.00	1.00	.50	2,000	100	1,500	1.0	20	150	50	70	<5
WV0404	616,690	4,321,480	5.0	1.00	.30	.30	1,500	50	700	<1.0	20	150	50	50	<5
WV0405	616,380	4,321,560	5.0	1.00	1.00	.30	1,000	50	500	<1.0	15	150	50	20	<5
WV0407	616,390	4,320,920	7.0	1.00	1.50	.50	2,000	70	1,000	1.0	20	150	30	70	5
WV0411	616,740	4,321,660	5.0	1.00	.70	.30	1,500	50	500	<1.0	20	150	50	20	5
WV0412	618,170	4,315,120	5.0	.70	.05	.30	500	50	200	N	10	100	20	20	<5
WV0414	616,170	4,315,120	5.0	.50	.05	.30	70	70	300	N	5	300	20	50	N
WV0415	617,665	4,315,490	5.0	.20	.05	.30	20	70	100	N	<5	1,500	700	30	N
WV0416	617,660	4,317,410	1.0	.70	<.05	.30	50	20	300	N	10	100	50	30	N
WV0417	616,860	4,319,550	1.0	.20	N	.30	<10	30	70	N	<5	100	<5	30	N

Table 1.--Stream-Sediment Samples - Geochemical Analyses - Otter Creek Wilderness -- Continued

sample	S-NB	S-NI	S-PB	S-SC	S-SN	S-SR	S-V	S-Y	S-ZR	AA-ZN-P
WV0129	<20	15	10	5	N	N	30	15	200	85
WV0130	N	10	10	5	N	N	20	10	300	50
WV0131	N	10	20	5	N	N	20	10	150	75
WV0132	<20	30	15	5	N	<100	50	15	500	140
WV0133	<20	30	15	5	N	<100	50	10	300	90
WV0134	<20	30	30	7	N	<100	70	15	150	55
WV0135	N	7	10	N	N	N	15	10	70	70
WV0138	N	30	20	5	N	<100	50	15	200	80
WV0139	N	10	10	<5	N	N	20	<10	200	60
WV0141	N	10	10	5	N	<100	20	10	300	50
WV0143	N	5	10	5	N	N	50	10	1,000	20
WV0144	<20	10	10	<5	N	N	50	10	200	30
WV0145	<20	15	30	7	N	<100	100	15	300	40
WV0201	N	7	10	<5	N	N	20	<10	200	25
WV0211	N	10	10	5	N	N	30	10	200	35
WV0212	N	<5	10	5	N	N	20	10	1,000	15
WV0213	N	<5	15	5	N	N	50	10	300	20
WV0214	N	5	10	5	N	N	15	<10	300	10
WV0215	N	<5	<10	10	N	N	15	<10	700	N
WV0216	<20	50	30	5	N	<100	70	30	300	150
WV0217	N	30	15	7	N	N	30	10	500	60
WV0301	N	20	10	5	N	N	20	10	100	80
WV0303	<20	30	50	10	N	<100	100	20	500	60
WV0304	N	30	10	<5	N	N	20	<10	70	90
WV0305	N	5	<10	<5	N	N	20	10	70	50
WV0306	N	20	15	5	N	<100	50	30	150	55
WV0308	N	30	20	7	N	N	70	15	200	100
WV0309	<20	30	30	7	N	<100	70	15	300	75
WV0310	N	20	20	<5	N	N	30	<10	150	70
WV0311	<20	10	20	10	N	100	100	30	1,000	20
WV0312	20	20	50	15	N	100	200	70	>1,000	30
WV0403	<20	30	70	15	N	100	150	50	500	75
WV0404	N	20	30	10	N	<100	100	20	200	80
WV0405	<20	30	30	10	N	<100	70	20	200	85
WV0407	<20	50	70	15	N	100	100	30	300	85
WV0411	<20	50	30	10	30	N	10	20	200	110
WV0412	<20	10	30	7	N	N	100	15	200	40
WV0414	<20	10	30	10	N	<100	70	20	500	30
WV0415	<20	5	100	20	N	100	50	50	>1,000	45
WV0416	<20	20	30	10	N	<100	100	20	300	30
WV0417	<20	<5	<10	5	N	N	20	<10	150	15

Table 2.--Rock Samples - Geochemical Analyses - Otter Creek Wilderness

sample	X-COORD.	Y-COORD.	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-B	S-BA	S-BE	S-CO	S-CR	S-CU	S-LA	S-MO
WV0003	610,360	4,309,700	5.00	.50	.30	.500	700	70	200	1.0	10	150	30	70	N
WV0004	610,120	4,309,780	1.00	1.00	.30	.150	70	10	1,000	<1.0	5	70	7	N	N
WV0005	609,960	4,309,760	3.00	1.00	1.00	.300	700	70	300	1.5	20	70	50	50	N
WV0006	610,040	4,309,800	3.00	1.50	.70	.300	700	70	700	1.0	20	100	50	50	N
WV0007	609,640	4,309,380	5.00	.70	.20	.500	700	100	300	2.0	30	100	50	50	N
WV0008	609,080	4,309,200	3.00	1.50	.10	.300	200	100	500	1.0	20	100	30	50	N
WV0009	608,940	4,309,300	5.00	.70	3.00	.500	700	150	<20	2.0	30	150	50	70	N
WV0010	608,380	4,308,860	.10	1.50	>20.00	.015	150	<10	50	<1.0	20	20	<5	<20	N
WV0015	619,980	4,315,460	.30	.70	20.00	.050	300	<10	150	<1.0	30	30	5	<20	N
WV0034	617,360	4,321,920	1.00	1.50	>20.00	.200	300	20	300	1.0	7	50	<5	50	N
WV0102	610,040	4,310,040	.70	.70	.15	.150	20	20	300	<1.0	N	20	7	20	N
WV0103	610,260	4,309,800	2.00	.20	<.05	.300	50	70	1,500	1.0	5	150	10	30	N
WV0104	610,240	4,309,690	7.00	.30	3.00	.500	1,000	200	50	1.5	30	150	50	100	N
WV0105	609,700	4,309,460	1.00	1.50	<.05	.050	500	50	500	<1.0	10	20	10	<20	7
WV0106	609,600	4,309,450	2.00	.05	.30	.500	2,000	100	500	1.0	30	70	30	50	N
WV0107	609,480	4,308,930	1.50	1.00	1.00	.300	1,000	50	500	<1.0	5	70	20	30	N
WV0108	609,465	4,308,870	5.00	1.00	3.00	.300	500	70	500	1.0	30	150	50	50	N
WV0109	609,465	4,308,870	3.00	1.50	1.00	.500	1,000	70	150	1.0	15	150	70	50	N
WV0110	608,945	4,309,310	1.50	1.50	15.00	.200	100	20	20	1.0	30	50	7	50	N
WV0111	608,400	4,308,920	.10	.70	20.00	.020	200	N	500	<1.0	7	20	<5	<20	N
WV0112	608,360	4,308,910	.15	.70	>20.00	.020	100	<10	<20	<1.0	N	30	<5	20	N
WV0113	608,270	4,308,910	.20	1.00	>20.00	.100	100	10	50	<1.0	5	30	<5	20	N
WV0136	613,830	4,322,200	1.00	.50	.05	.300	70	20	300	<1.0	10	50	10	N	N
WV0137	613,830	4,322,200	3.00	1.00	.30	.500	200	100	500	1.0	15	100	50	50	N
WV0140	617,030	4,322,470	2.00	1.00	<.05	.300	300	70	300	<1.0	15	100	30	50	N
WV0142	618,800	4,325,310	5.00	.70	.10	.300	100	100	300	1.0	20	70	7	50	N
WV0202	610,420	4,309,650	5.00	1.00	N	.500	500	70	500	1.5	30	150	50	70	N
WV0203	609,900	4,309,750	2.00	.30	<.05	.300	100	50	200	<1.0	10	70	10	20	15
WV0204	609,560	4,309,110	1.50	.70	5.00	.150	1,000	10	200	N	10	50	7	20	N
WV0205	608,720	4,309,240	2.00	.70	.10	.300	200	100	200	<1.0	10	100	20	30	N
WV0206	608,620	4,309,170	1.00	1.50	>20.00	.070	500	200	150	<1.0	5	50	7	30	N
WV0207	608,580	4,309,140	.70	1.00	15.00	.100	70	10	70	N	5	50	<5	20	N
WV0208	608,380	4,308,870	.15	1.50	20.00	.020	700	<10	20	N	5	20	<5	20	N
WV0209	608,180	4,308,900	.05	.50	10.00	.007	700	N	N	N	N	10	<5	N	N
WV0210	608,180	4,308,900	.50	.70	7.00	.050	70	<10	20	N	N	20	<5	N	N
WV0302	616,710	4,322,390	5.00	1.00	.15	.300	50	70	300	N	20	100	30	50	N
WV0401	616,400	4,321,820	1.00	.70	2.00	.150	50	30	200	N	<5	50	5	20	N
WV0402	616,680	4,322,005	1.50	1.00	15.00	.300	70	70	200	N	7	70	7	50	N
WV0406	616,380	4,321,560	1.00	.70	10.00	.100	300	10	100	N	7	700	<5	50	N
WV0408	616,390	4,320,920	1.50	.70	.10	.300	100	50	200	N	5	70	<5	30	N
WV0409	616,350	4,320,620	2.00	.70	.05	.300	200	50	200	N	10	70	7	20	N
WV0410	616,570	4,321,490	2.00	1.50	20.00	.300	100	100	300	N	30	100	10	50	N
WV0413	618,170	4,315,120	1.50	.30	<.05	.150	300	20	70	N	5	20	5	<20	N

Table 2.--Rock Samples - Geochemical Analyses - Otter Creek Wilderness -- Continued

sample	S-NB	S-NI	S-PB	S-SC	S-SN	S-SR	S-V	S-Y	S-ZR	AA-ZN-P
WV0003	<20	30	20	30	<10	100	100	30	300	50
WV0004	N	20	<10	5	<10	N	20	10	100	100
WV0005	<20	50	10	5	N	N	100	30	300	65
WV0006	<20	50	20	10	<10	<100	70	30	300	90
WV0007	<20	50	20	10	<10	<100	100	50	300	90
WV0008	<20	50	10	15	<10	100	100	30	300	80
WV0009	20	100	15	10	<10	<100	150	50	500	65
WV0010	N	<5	<10	20	N	100	10	<10	20	20
WV0015	N	5	10	N	N	<100	15	15	30	30
WV0034	<20	10	10	10	N	100	50	30	100	20
WV0102	N	5	15	N	N	200	30	10	100	10
WV0103	<20	15	20	5	N	500	100	15	200	30
WV0104	20	100	50	7	<10	300	200	70	500	70
WV0105	<20	20	<10	30	N	N	20	<10	10	15
WV0106	20	50	20	N	<10	<100	100	30	500	40
WV0107	<20	20	10	10	N	200	100	20	300	40
WV0108	<20	50	70	5	<10	N	70	50	200	90
WV0109	<20	50	20	20	10	<100	100	50	200	85
WV0110	N	10	15	7	N	200	50	30	200	20
WV0111	N	<5	10	N	N	100	10	<10	50	15
WV0112	N	<5	10	N	N	300	10	20	20	10
WV0113	N	5	10	5	N	500	15	10	70	25
WV0136	N	20	10	5	N	N	50	10	70	60
WV0137	N	30	20	20	<10	150	100	30	300	35
WV0140	<20	30	15	10	N	<100	70	15	150	80
WV0142	<20	30	10	10	N	100	100	20	300	60
WV0202	<20	70	30	20	<10	100	150	50	150	130
WV0203	<20	20	15	7	N	<100	70	20	300	40
WV0204	N	15	20	5	N	100	30	20	200	60
WV0205	<20	30	10	7	N	<100	70	20	300	60
WV0206	N	10	10	7	N	100	30	20	50	25
WV0207	N	10	<10	7	N	300	20	20	500	35
WV0208	N	<5	10	5	N	300	10	20	30	10
WV0209	N	<5	<10	N	N	200	10	10	50	20
WV0210	N	<5	<10	N	N	<100	10	10	10	30
WV0302	<20	30	10	5	N	<100	70	20	70	60
WV0401	N	10	10	N	N	<100	20	N	<10	75
WV0402	<20	15	10	5	N	200	70	N	10	30
WV0406	N	7	30	7	N	200	15	10	30	40
WV0408	N	10	15	5	N	N	50	20	300	60
WV0409	N	20	15	5	N	N	50	10	10	70
WV0410	<20	20	150	10	N	500	70	30	200	50
WV0413	N	10	10	<5	N	N	20	<10	200	35