UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analyses and descriptions of geochemical samples, Rich Hole Roadless Area, Alleghany and Rockbridge Counties, Virginia

by

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1/ Denver, Colo.
2/ Reston, Va.

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STUDIES RELATED TO WILDERNESS

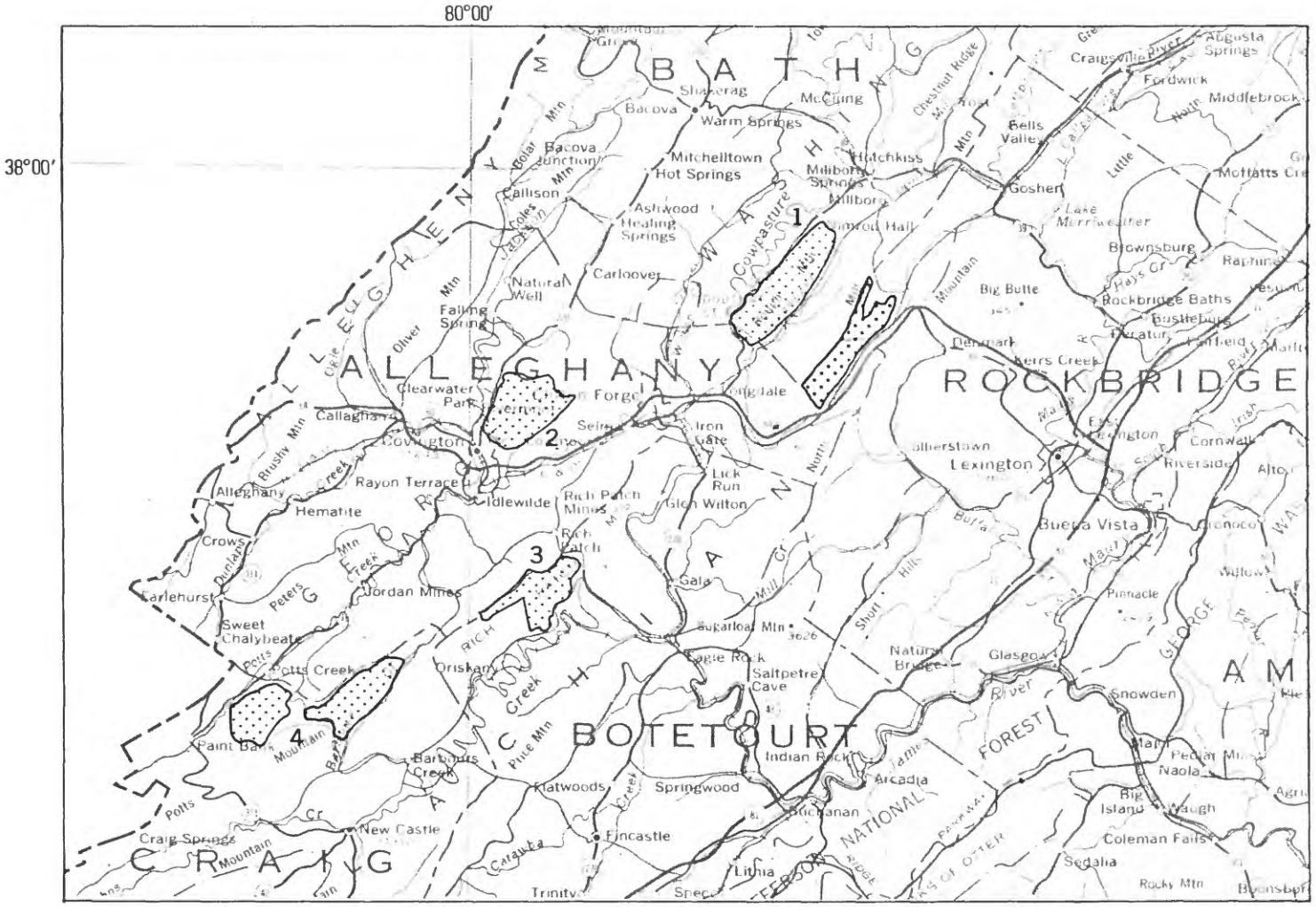
The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey (USGS) and the U.S. Bureau of Mines to survey certain areas on Federal lands in order to determine the mineral values, if any, that may be present. Results must be made available to the public and be submitted to the President and the Congress. This report presents the analytical results of a geochemical survey of the Rich Hole Roadless Area (08-041) in the George Washington National Forest, Alleghany and Rockbridge Counties, Va. The area was classified as a proposed wilderness during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January, 1979, and designated a wilderness study area by the Virginia Wilderness Act of 1984, Public Law 98-586, October 30, 1984.

Abstract

Semiquantitative spectrographic analyses for 31 elements on 29 stream-sediment and 109 rock samples from the Rich Hole Roadless Area, Alleghany and Rockbridge Counties, Va., are reported here in detail. Atomic-absorption analyses for zinc in all samples are also reported. Rocks analyzed include sandstone, shale, and limestone and a brief description of each rock sample is included. Localities for all samples are given in Universal Transverse Mercator (UTM) coordinates.

INTRODUCTION

The analyses presented in this report (Table 1) are of 29 stream-sediment and 109 rock samples from the Rich Hole Roadless Area, Alleghany and Rockbridge Counties, Va. (Fig. 1). These were collected by F. G. Lesure, S. W. Nicholson, S. M. Heinrich, and K. L. Cinsavich in October 1983. Stream sediment samples were collected from most of the small drainage basins



Base from U.S. Geological Survey
Virginia State map, 1973, 1:500,000

0 10 MILES
0 10 KILOMETERS

EXPLANATION

Rich Hole Roadless Area

Other roadless areas
1. Rough Mountain
2. Dolly Ann
3. Hoop Hole
4. Barbours Creek

Index map showing location of the Rich Hole Roadless Area and other roadless areas.

in the study area. These represent several handfuls, randomly collected, of the finest sediment available at the sample site in the stream. Rock samples analyzed are described briefly in a separate section of this report. All but 5 are chip samples taken across bedding or layering over a measured thickness of representative material from outcrops or road cuts; the exceptions are grab samples. The samples are representative of the major rock types exposed in the area. Some of the rock is partly weathered, but generally the freshest material available was sampled. B. D. Martin (USGS) made X-ray diffraction identifications of iron and manganese minerals. Maps showing sample localities and discussion of the results of the analytical work are given by Lesure (in press).

ANALYTICAL TECHNIQUES

Each sample was analyzed semiquantitatively for 31 elements by means of a six-step, D.C. (direct-current) arc, optical-emission spectrographic method (Grimes and Marranzino, 1968) by E. A. Bailey in the USGS laboratories, Denver, Colo. In addition, each sample was analyzed for zinc by an atomic-absorption technique (Ward and others, 1969, p.20) by K. A. Romine and Marianne Walter, USGS laboratories, Denver, Colo. 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 ten of these numbers) and are approximate geometric midpoints of the concentration ranges. The expected precision is 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 (Motooka and Grimes, 1976).

The visual lower limits of determination for the 31 elements that were determined spectrographically are as follows:

For those given in percent:

Calcium	0.05	Magnesium	0.02
Iron	0.05	Titanium	0.002

For those given in ppm:

Antimony	100	Molybdenum	5
Arsenic	200	Nickel	5
Barium	20	Niobium	20
Beryllium	1	Scandium	5
Bismuth	10	Silver	0.5
Boron	10	Strontium	100
Cadmium	20	Thorium	100
Chromium	10	Tin	10
Cobalt	5	Tungsten	50
Copper	5	Vanadium	10
Gold	10	Yttrium	10
Lanthanum	20	Zinc	200
Lead	10	Zirconium	10
Manganese	10		

Six samples were analyzed for uranium by fluorometric methods by T. A. Roemer, USGS Laboratories, Denver, Colo.

Sample:		
	VRH 001 - 4.5 ppm U	VRH 128 - 1.2 ppm U
	VRH 030 - 0.15 ppm U	VRH 328 - 5.1 ppm U
	VRH 130 - 3.7 ppm U	VRH 335 - 24 ppm U

ROCK DESCRIPTIONS

Sample No.	Description
VRH 001	2-m chip sample, medium-dark-gray fissile shale. Romney Shale.
VRH 003	1-m chip sample, very pale-orange fine-grained, hard, quartzitic sandstone; minor opaque grains. Keefer Sandstone.
VRH 004	1-m chip sample, blackish-red, fine- to medium-grained, hard, hematitic sandstone. Rose Hill Formation. Specific gravity (sp gr) 3.02.
VRH 005	0.3-m chip sample, grayish- to blackish-red, sandy limonite; some manganese coating. Rose Hill Formation. sp gr 2.91.
VRH 006	1-m chip sample, blackish-red, very fine- to fine-grained, hematitic sandstone; 0.1-0.2 cm white clasts. Rose Hill Formation. sp gr 2.86.
VRH 007	1-m chip sample, grayish-red, very fine-grained shaly hematitic sandstone. Rose Hill Formation. sp gr 2.74.
VRH 008	1-m chip sample, grayish-orange, non-hematitic silty shale. Rose Hill Formation.
VRH 009	0.6-m chip sample, light-olive-gray, very fine- to fine-grained sandstone; grayish-red mudstone clasts. Juniata Formation.
VRH 010	1-m chip sample, light-olive-gray to pale-yellowish-brown, medium-grained, hard, quartzitic sandstone. Juniata Formation.
VRH 011	0.6-m chip sample, blackish-red, dark-yellowish-orange, porous, cherty limonite. Oriskany iron ore zone, large cut of Longdale mine. sp gr 3.29. Iron mineral is mostly goethite.
VRH 012	1.5-m chip sample, moderate-brown clayey limonite. Oriskany iron ore zone. Longdale mine. sp gr 3.07.
VRH 013	1-m chip sample, very fine-grained sandstone breccia containing grayish-brown to blackish-red limonite matrix and dark-gray manganese staining; sandstone fragments up to 1.5 cm. Hanging wall of Oriskany iron ore zone, large cut of Longdale mine. sp gr 2.95.

VRH 014 3-m chip sample, blackish-red, very fine- to medium-grained hematitic sandstone; some white clasts, weathered. Rose Hill Formation. sp gr 2.82.

VRH 015 1-m chip sample, yellowish-gray, fine- to medium-grained sandstone; minor opaque grains, weathers to moderate brown. Juniata Formation.

VRH 016 1.5-m chip sample, white to pinkish-gray, medium- to coarse-grained quartzitic sandstone, hematitic stains; white quartz pebbles up to 3 cm. Tuscarora Quartzite.

VRH 017 1-m chip sample, blackish-red, fine-grained hematitic sandstone. Rose Hill Formation. sp gr 2.89.

VRH 018 1-m chip sample, blackish-red, very fine- to fine-grained, hard, hematitic sandstone. Rose Hill Formation. sp gr 2.81.

VRH 019 Composite sample, black to grayish-black, botryoidal, cryptomelane and goethite coating, 3 to 5 cm thick on joint surface in the Keefer Sandstone. sp gr 2.85.

VRH 020 1.4-m chip sample, blackish-red, very fine- to fine-grained, hard, hematitic sandstone. Rose Hill Formation. sp gr 2.85.

VRH 021 3-m chip sample, blackish-red, very fine- to fine-grained, hard, hematitic sandstone. Rose Hill Formation. sp gr 2.82.

VRH 023 1-m chip sample, very pale-orange, fine- to medium-grained, friable sandstone; some hematitic stains. Upper Silurian-Lower Devonian undivided, possibly Ridgeley sandstone.

VRH 024 1-m chip sample, pale-red, fine- to medium-grained, porous sandstone. Grayish-black lithiophorite coating up to 1 cm thick. Upper Silurian-Lower Devonian undivided, possibly Clifton Forge Sandstone. sp gr 2.69.

VRH 025 1-m chip sample, blackish-red, fine- to medium-grained, hematitic sandstone; weathered, clay galls. Rose Hill Formation. sp gr 2.82.

VRH 026 1-m chip sample, dusky-red-purple, fine- to medium-grained, hematitic sandstone; contains Scolithus. Keefer Sandstone. sp gr 2.75-2.89.

VRH 027 1-m chip sample, blackish-red, medium- to coarse-grained, hematitic sandstone. Rose Hill Formation. sp gr 2.87.

VRH 030 1-m chip sample, medium-dark-gray, fissile shale; weathers to yellowish-gray. Romney Shale.

VRH 031 0.3 m chip sample, grayish-red limonite; gray to black coating of goethite. Victoria mine. sp gr 3.14-3.36.

VRH 032 1-m chip sample, dark-yellowish-orange to moderate-brown sandy limonite. Victoria mine. sp gr 2.75.

VRH 033 1.2-m composite, limonite-cemented chert breccia from footwall of Oriskany iron ore zone. Rockbridge Alum Springs mine. sp gr 3.52.

VRH 055 1-m chip sample, grayish-red to medium-gray chert breccia and limonite; dark-gray manganese staining. Victoria mine. sp gr 3.10.

VRH 100 1-m chip sample, white to very pale-orange, fine- to medium-grained, hard, quartzitic sandstone. Tuscarora Quartzite.

VRH 101 1-m chip sample, greenish-gray, silty shale. Romney Shale(?).

VRH 102 2-m chip sample, blackish-red, very fine- to fine-grained hematitic sandstone. Rose Hill Formation. sp gr 2.78.

VRH 103 1-m chip sample, grayish-red, fine-grained, hematitic sandstone. Rose Hill Formation. sp gr 2.75.

VRH 104 1-m chip sample, blackish-red, very fine- to fine-grained hematitic sandstone. Rose Hill Formation. sp gr 2.76.

VRH 105 1-m chip sample, blackish-red, fine-grained, hematitic sandstone; clay galls, layers of less hematitic sandstone. Rose Hill Formation. sp gr 2.66.

VRH 106 1-m chip sample, very light-gray, fine- to medium-grained, clean quartzitic sandstone; minor opaque grains. Tuscarora Quartzite.

VRH 107 1-m chip sample, white to grayish-orange-pink, fine-grained sandstone with quartz pebbles up to 0.5 cm. Tuscarora Quartzite.

VRH 108 1-m chip sample, pinkish-gray, fine- to medium-grained, quartzitic sandstone; minor heavy minerals. Tuscarora Quartzite.

VRH 109 1-m chip sample, pinkish-gray, very fine-grained quartzitic sandstone; weathered, well sorted, minor opaque grains. Keefer Sandstone.

VRH 110 1-m chip sample, pale-yellowish-brown to light-olive-gray, fine-grained, quartzitic sandstone; minor opaque grains. Keefer Sandstone.

VRH 111 1.2-m chip sample; light-olive-gray to yellowish-gray, very fine- to medium-grained, porous sandstone; minor limonitic layers. Upper Keefer Sandstone, possibly Wills Creek(?) or Williamsport(?).

VRH 113 2-m chip sample, white, very fine-grained, clean quartzitic sandstone; 0.1 cm thick hematitic sandstone layers, weathered. Keefer Sandstone.

VRH 114 2-m chip sample, very light-gray to pinkish-gray, fine- to medium-grained sandstone; weathered. Tuscarora quartzite.

VRH 115 2-m chip sample, light-olive-gray to grayish-orange, fine-grained, hard, quartzitic sandstone; minor opaque grains, clay clasts. Juniata Formation.

VRH 116 1-m chip sample, blackish-red, fine-grained, hematitic sandstone. Rose Hill Formation. sp gr 2.87.

VRH 117 1-m chip sample, blackish-red, medium- to coarse-grained hematitic sandstone; clay clasts up to 0.3 cm. Rose Hill Formation. sp gr 2.80.

VRH 118 1-m chip sample, white to very pale-orange, medium-grained, clean, quartzitic sandstone; hematitic veinlets. Tuscarora Quartzite.

VRH 119 1-m chip sample, moderate-yellowish-brown, fine- to medium-grained, well cemented sandstone; minor opaque grains, weathered. Juniata Formation.

VRH 120 1-m chip sample, white to pale-red, fine- to medium-grained, quartzitic sandstone; quartz pebbles up to 1 cm, minor opaque grains, weathered. Tuscarora Quartzite.

VRH 121 1-m chip sample, blackish-red, very fine- to fine-grained, hematitic sandstone; minor white quartz clasts, weathered. Rose Hill Formation. sp gr 2.70.

VRH 122 2-m chip sample, pale-yellowish-brown, medium-grained, well-cemented sandstone. Tuscarora Quartzite.

VRH 123 1-m chip sample, grayish- to dusky-brown, very fine-grained hematitic sandstone. Rose Hill Formation. sp gr 2.78.

VRH 125 1-m chip sample, olive-gray shale. Possibly Jennings Formation.

VRH 126 1-m chip sample, grayish-orange to pale-yellowish-brown shale. Romney Shale.

VRH 127 Composite, limonite-cemented sandstone and chert breccia from hanging wall of Oriskany iron ore zone, Victoria mine. sp gr 2.75-3.08.

VRH 128 1-m chip sample, dark-yellowish-orange chert breccia and dark gray manganese cement; light-gray chert fragments up to 3 cm. Footwall of Oriskany iron ore zone, Victoria mine. sp gr 2.58. Manganese mineral is lithiophorite.

VRH 130 1-m chip sample, black, fissile shale. Romney Shale.

VRH 131 1-m chip sample, dark-yellowish-orange, very friable, limonite, Victoria mine.

VRH 132 1-m chip sample, dark-yellowish-orange, medium- to coarse-grained, friable sandstone. Upper Silurian-Lower Devonian undivided, possibly Ridgeley sandstone.

VRH 133 1-m chip sample, gray-red to dark-yellowish-orange, medium-grained, friable limonitic sandstone. Upper Silurian-Lower Devonian undivided, possibly Ridgeley Sandstone.

VRH 134 1-m chip sample, light- to moderate-brown, medium-grained, friable, limonite cemented sandstone; weathered. Upper Silurian-Lower Devonian undivided, possibly Ridgeley Sandstone. sp gr 2.45.

VRH 201 0.3-m chip sample, blackish-red, medium- to coarse-grained, hematitic sandstone; weathered. Rose Hill Formation. sp gr 2.69.

VRH 202 2-m chip sample, blackish-red, very fine-grained hematitic sandstone. Rose Hill Formation. sp gr 2.69.

VRH 203 1.5-m chip sample, blackish-red, fine- to medium-grained hematitic sandstone; some quartz clasts up to 0.2 cm, minor clay galls. Rose Hill Formation. sp gr 2.80.

VRH 204 1-m chip sample, grayish-pink, very fine-grained sandstone; minor hematitic veinlets and staining. Rose Hill Formation.

VRH 205 1-m chip sample, grayish-red, medium-grained, sandy limonite; weathered. Longdale mine. sp gr 3.18.

VRH 206 1-m chip sample, moderate-yellowish-brown clayey limonite. Longdale mine. sp gr 2.87.

VRH 208 1-m chip sample, moderate-pink to yellowish-gray, very fine- to fine-grained, clean sandstone; secondary quartz mineralization. Keefer Sandstone.

VRH 209 2-m chip sample, white, medium-grained quartzitic sandstone; weathers to grayish-orange, pebbles up to 1 cm. Tuscarora Quartzite.

VRH 210 2-m chip sample, light olive-gray, very fine-grained sandstone. Martinsburg Shale.

VRH 211 1-m chip sample, blackish-red, fine-grained hematitic sandstone. Rose Hill Formation. sp gr 2.88.

VRH 213 1-m chip sample, grayish-orange-pink, fine-grained quartzitic sandstone; minor opaque grains, weathered. Keefer Sandstone.

VRH 216 1-m chip sample, pale- to dark-yellowish-orange, fine-grained, quartzitic sandstone. Keefer Sandstone.

VRH 222 1-m chip sample, pale- to dark-yellowish brown, fine-grained sandstone; secondary quartz, weathered. Juniata Formation.

VRH 223 1-m chip sample, grayish-orange, very fine- to fine-grained quartzitic sandstone; minor opaque grains, weathered. Keefer Sandstone.

VRH 224 1-m chip sample, grayish- to yellowish-orange, very fine- to fine-grained sandstone; minor opaque grains. Keefer Sandstone.

VRH 228 1-m chip sample, olive-gray shale. Romney Shale.

VRH 300 1-m chip sample, white to very pale-orange, medium-grained, friable, quartzitic sandstone; weathered. Keefer Sandstone.

VRH 302 1-m chip sample, grayish-orange, fine-grained sandstone. Juniata Formation.

VRH 303 1-m chip sample, light-olive-gray, very fine- to fine-grained sandstone; minor opaque grains. Juniata Formation.

VRH 304 1-m chip sample, pale-yellowish-brown, very fine-grained sandstone; weathered. Juniata Formation.

VRH 305 1-m chip sample, pale-yellowish-orange to light-brown, fine-grained sandstone; minor opaque grains. Keefer Sandstone.

VRH 306 3-m chip sample, grayish-orange-pink, very fine-grained, quartzitic sandstone; minor opaque grains. Keefer Sandstone.

VRH 307 2-m chip sample, blackish-red, medium- to coarse-grained, hematitic sandstone; silicic clasts up to 0.5 cm. Rose Hill Formation. sp gr 2.79.

VRH 308 1-m chip sample, light-olive-gray sandy shale. Martinsburg Shale.

VRH 310 1-m chip sample, dusky-red to dark-yellowish-orange limonitic cherty breccia from footwall of Oriskany iron ore zone, Longdale mine. sp gr 2.69.

VRH 314 2-m chip sample, blackish-red, very fine- to fine-grained, hematitic sandstone; weathered, minor clay galls. Rose Hill Formation. sp gr 2.86-2.96.

VRH 315 1-m chip sample, blackish-red, very fine-grained, hematitic sandstone; clay galls. Rose Hill Formation. sp gr 2.90.

VRH 316 3-m chip sample, blackish-red, very fine- to medium-grained, hematitic sandstone; clay galls. Rose Hill Formation. sp gr 2.50-2.69.

VRH 317 1-m chip sample, blackish-red, fine-grained hematitic sandstone; shale clasts up to 0.5 cm. Rose Hill Formation. sp gr 2.80.

VRH 318 2-m chip sample, blackish-red, very fine-grained, hard, hematitic sandstone; clay galls. Rose Hill Formation. sp gr 2.86.

VRH 319 1-m chip sample, blackish-red, very fine-grained, hematitic sandstone; clay galls. Rose Hill Formation. sp gr 2.84.

VRH 320 1-m chip sample, grayish- to very dusky-red, very fine-grained shaley sandstone; weathered. Rose Hill Formation. sp gr 2.64.

VRH 321 1-m chip sample, medium-dark-gray, very fine-grained sandstone. Martinsburg Shale.

VRH 322 0.4-m chip sample, pale-red, very fine- to fine-grained sandstone; minor opaque grains, hematitic stains. Rose Hill Formation. sp gr 2.63.

VRH 323 2-m chip sample, blackish-red, medium- to coarse-grained hematitic sandstone; clay galls, quartz pebbles up to 0.4 cm. Rose Hill Formation. sp gr 2.80-2.85.

VRH 324 Composite sample from boulders of limonitic sandstone; blackish-red, clay galls, minor opaque grains. Rose Hill Formation. sp gr 3.18-3.25.

VRH 325 1-m chip sample, grayish-red, fine- to medium-grained hematitic sandstone; clay galls, minor opaque grains. Rose Hill Formation. sp gr 2.75.

VRH 326 2-m chip sample, blackish-red, very fine- to fine-grained hematitic sandstone; clay galls, minor opaque grains. Rose Hill Formation. sp gr 2.74.

VRH 327 1-m chip sample, white to grayish-pink, very fine-grained sandstone; minor hematitic veins, weathered. Keefer Sandstone.

VRH 328 1-m chip sample, dark-gray, fissile shale; weathered. Romney Shale.

VRH 329 1-m chip sample, dusky-red, sandy limonite. Victoria mine. sp gr 3.12-3.24.

VRH 330 1-m chip sample, blackish-red to dark-yellowish-orange, limonitic sandstone; secondary quartz mineralization. Upper Silurian-Lower Devonian undivided, possibly Ridgeley Sandstone. sp gr 2.67.

VRH 331 2-m chip sample, pale-yellowish-brown limestone; weathered. Upper Silurian-Lower Devonian undivided, probably Tonoloway Limestone.

VRH 332 1-m chip sample, grayish-yellow, medium-grained sandstone fragments, weathered and dark gray manganese oxide cement. Manganese mineral is lithiophorite. Upper Silurian-Lower Devonian undivided, possibly Clifton Forge Sandstone. sp gr 2.69.

VRH 334 1-m chip sample, pinkish-gray, fine- to medium-grained sandstone; weathered. Upper Silurian-Lower Devonian undivided, possibly Clifton Forge Sandstone.

VRH 335 1-m chip sample, dark-gray, fissile shale. Romney Shale.

VRH 336 1-m chip sample, blackish-red to dark-yellowish-orange, medium-grained limonitic sandstone. Upper Silurian-Lower Devonian undivided, possibly Ridgeley Sandstone. sp gr 2.75.

EXPLANATION OF TABLE

The X and Y coordinates are Universal Transverse Mercator (UTM) grid, zone 17. The X coordinate is the easting value, in meters; the Y is the northing, in meters.

Iron, magnesium, calcium, and titanium, concentrations are reported in percent (pct); all others are in parts per million (ppm). Letters below chemical symbols indicate the method of analysis: s, six-step semiquantitative spectrographic method; aa, atomic absorption. Other symbols on the table are: N, not detected; --, not determined; <, amount detected is below the lower limit of determination, which is number shown; >, amount detected is above the upper limit of determination, which is number shown.

Elements looked for spectrographically but not found, except as noted, are listed below. The lower limits of determination for these elements are in parentheses.

For stream sediments: As (200); Au (10); Bi (10); Cd (20); Sb (100); Sn (10); W (50); and Th (100). Exceptions: Samples VRH 002, 028, 112, 124, 200, 221, 226, 312, 333, and 337 reported to contain detectable Bi but less than 10 ppm; sample VRH 221 reported to contain 20 ppm Cd, and samples VRH 124, 301, 311, and 337 reported to contain detectable Cd but less than 20 ppm.

For rock samples: As (200); Au (10), Bi (10); Cd (20); Sb (100); Sn (10); Th (100) and W (50). Exceptions: Samples VRH 302, 303, and 304 reported to contain detectable Bi but less than 10 ppm; sample VRH 019 reported to contain 500 ppm Cd, samples VRH 031 and 201, 70 ppm Cd, and sample VRH 322, detectable Cd but less than 20 ppm; samples VRH 100 and 331 reported to contain 20 ppm Sn, samples VRH 126 and 130 reported to contain detectable Sn but less than 10 ppm; sample VRH 332 reported to contain detectable W but less than 50 ppm.

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Sample	X coordinate	Y coordinate	Fe-pcts.	Mg-pcts.	Ca-pcts.	Ti-pcts.	Mn-ppms	Ag-ppms	B-ppms	Ba-ppms	Be-ppms	Co-ppms
VRH001	620,855	4,192,390	1.00	.30	<.05	.500	50	2.0	500	2,000	3.0	N
VRH003	623,460	4,195,120	.20	.03	<.05	.070	100	N	100	70	<1.0	N
VRH004	620,350	4,191,970	20.00	.02	<.05	.150	3,000	N	50	700	2.0	7
VRH005	620,350	4,191,970	20.00	.03	<.05	.050	>5,000	N	20	300	7.0	5
VRH006	620,350	4,191,970	10.00	.10	.15	.070	150	N	20	100	1.5	N
VRH007	620,350	4,191,970	15.00	.30	.05	1.000	150	N	100	500	3.0	10
VRH008	620,350	4,191,970	3.00	.70	<.05	1.000	200	N	700	500	5.0	7
VRH009	620,080	4,192,380	5.00	.70	<.05	.700	300	N	500	500	3.0	10
VRH010	620,080	4,192,380	.50	.15	<.05	.070	100	N	30	200	<1.0	N
VRH011	619,800	4,190,340	10.00	<.02	<.05	.010	200	N	N	20	3.0	10
VRH012	619,380	4,189,820	20.00	.30	<.05	.200	5,000	N	500	700	15.0	50
VRH013	619,620	4,190,230	20.00	.10	<.05	.050	>5,000	N	70	2,000	7.0	70
VRH014	619,275	4,190,420	15.00	.03	<.05	.070	150	N	20	300	2.0	N
VRH015	618,850	4,190,690	1.50	.20	<.05	.500	150	N	100	300	1.0	N
VRH016	618,580	4,190,210	N	<.02	<.05	.070	150	N	30	50	N	N
VRH017	618,420	4,189,650	20.00	.05	<.05	.100	200	N	50	300	1.5	5
VRH018	618,840	4,189,670	15.00	.03	.05	.070	100	N	50	70	1.5	N
VRH019	619,110	4,189,610	15.00	<.02	.07	<.002	>5,000	N	N	5,000	10.0	1,500
VRH020	619,070	4,189,860	15.00	.05	<.05	.100	150	N	100	150	2.0	N
VRH021	617,620	4,190,250	20.00	.05	.10	.200	150	N	150	70	1.0	N
VRH023	617,320	4,188,690	.10	<.02	<.05	.050	2,000	N	10	70	<1.0	N
VRH024	616,420	4,188,600	15.00	<.02	<.05	.030	>5,000	N	20	3,000	1.5	50
VRH025	619,200	4,194,420	20.00	.10	.05	.100	150	N	70	100	1.0	5
VRH026	619,140	4,192,880	15.00	.05	<.05	.150	30	N	300	1,000	2.0	N
VRH027	617,620	4,190,860	15.00	.05	.05	.050	200	N	30	150	2.0	N
VRH030	621,860	4,195,570	5.00	.70	<.05	.700	1,000	2.0	700	1,000	5.0	N
VRH031	622,510	4,193,840	20.00	.10	<.05	.030	>5,000	N	N	500	20.0	100
VRH032	622,510	4,193,840	20.00	<.02	<.05	.007	>5,000	N	N	100	30.0	100
VRH033	620,990	4,196,140	20.00	.07	.05	.030	5,000	N	50	300	7.0	20
VRH055	622,950	4,194,350	20.00	.05	<.05	.070	>5,000	N	<10	5,000	30.0	>2,000
VRH100	619,690	4,192,960	.10	.02	<.05	.030	150	N	50	70	N	N
VRH101	621,710	4,192,970	5.00	1.00	<.05	1.000	1,000	N	1,000	1,000	5.0	10
VRH102	620,350	4,191,970	15.00	.05	.10	.070	200	N	20	50	2.0	N
VRH103	620,350	4,191,970	15.00	.03	<.05	.050	70	N	20	100	1.5	N
VRH104	620,350	4,191,970	15.00	.02	<.05	.070	100	N	50	100	1.0	N
VRH105	620,350	4,191,970	5.00	.07	<.05	.500	30	N	200	300	<1.0	N
VRH106	620,210	4,191,960	.20	<.02	<.05	.020	200	N	150	50	<1.0	N
VRH107	620,210	4,191,960	<.05	<.02	<.05	.030	50	N	20	70	<1.0	N
VRH108	620,210	4,191,960	.05	.05	<.05	.200	200	N	500	150	1.0	N
VRH109	620,570	4,192,400	.05	.02	<.05	.150	50	N	200	70	<1.0	N
VRH110	617,250	4,186,620	.70	.07	<.05	.150	1,500	N	200	300	1.0	5
VRH111	617,150	4,186,610	.20	.10	.05	.200	500	N	100	200	1.0	N
VRH113	619,870	4,190,620	.50	.10	<.05	.150	30	N	200	70	<1.0	N
VRH114	619,590	4,190,920	.05	.03	<.05	.200	50	N	150	200	<1.0	N
VRH115	619,560	4,190,960	.70	.30	<.05	.300	150	<.5	100	300	1.5	N

Rich Hole - Rocks

Sample	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Zn-ppm aa
VRH001	70	7	50	100	N	20	100	10	150	700	30	N	70	N
VRH003	<10	<5	30	N	N	<5	N	N	N	10	<10	N	300	N
VRH004	30	5	200	N	N	10	<10	7	200	150	100	N	500	5
VRH005	10	10	N	N	N	20	10	5	N	50	20	N	100	15
VRH006	20	10	50	N	N	20	<10	7	<100	70	70	N	300	10
VRH007	70	15	100	N	<20	30	10	15	<100	100	100	N	>1,000	10
VRH008	100	10	70	N	N	20	<10	15	150	100	50	N	300	20
VRH009	70	30	50	N	N	30	<10	10	<100	70	50	N	500	45
VRH010	10	<5	20	N	N	<5	<10	N	N	10	10	N	200	5
VRH011	10	5	N	N	N	100	50	N	N	10	15	700	30	800
VRH012	30	50	N	N	N	200	20	20	<100	200	50	500	70	350
VRH013	20	10	N	N	N	1,000	200	N	N	15	50	1,000	50	840
VRH014	15	15	30	N	N	10	N	7	N	50	50	N	300	10
VRH015	20	7	N	N	N	<5	<10	<5	N	30	20	N	700	5
VRH016	N	<5	30	N	N	N	N	N	N	<10	10	N	100	N
VRH017	20	10	150	N	N	20	N	10	<100	150	70	N	150	15
VRH018	20	5	N	N	N	N	N	7	N	50	30	N	70	5
VRH019	<10	100	N	N	N	50	3,000	N	300	50	10	3,000	N	1,700
VRH020	20	5	N	N	N	N	N	5	<100	50	50	N	700	5
VRH021	30	10	100	N	N	20	N	10	<100	100	100	N	300	10
VRH023	N	<5	20	N	N	N	N	N	N	<10	<10	N	50	5
VRH024	N	20	N	N	N	150	50	<5	N	15	15	<200	150	230
VRH025	30	15	70	N	N	20	N	10	N	70	70	N	500	5
VRH026	20	<5	N	N	N	N	<10	5	200	70	50	N	1,000	N
VRH027	20	10	N	N	N	15	<10	5	<100	30	50	N	200	15
VRH030	100	50	50	50	N	10	100	20	100	500	30	N	70	50
VRH031	20	20	N	N	N	500	100	N	N	20	30	500	30	530
VRH032	N	10	N	N	N	1,000	70	N	<100	10	50	2,000	N	430
VRH033	20	20	N	N	N	300	200	N	<100	30	50	700	50	640
VRH055	20	500	N	N	N	3,000	500	5	N	30	200	5,000	70	3,500
VRH100	N	<5	30	N	N	<5	N	N	N	<10	N	N	100	N
VRH101	70	30	N	N	N	30	10	20	N	150	30	N	70	50
VRH102	20	5	N	N	N	15	N	5	<100	50	30	N	70	20
VRH103	20	<5	30	N	N	N	<10	5	<100	50	30	N	150	10
VRH104	10	10	70	N	N	N	<10	7	N	70	30	N	70	5
VRH105	20	<5	150	N	N	N	<10	5	100	50	70	N	1,000	N
VRH106	N	<5	20	N	N	<5	N	N	N	<10	10	N	500	N
VRH107	N	N	20	N	N	N	N	N	N	<10	10	N	50	N
VRH108	10	7	N	N	N	N	<10	<5	N	20	10	N	100	N
VRH109	N	<5	20	N	N	50	N	5	N	<10	15	N	>1,000	N
VRH110	<10	7	N	N	N	10	10	N	N	10	20	N	1,000	55
VRH111	<10	<5	20	N	N	<5	N	<5	N	10	15	N	200	10
VRH113	N	<5	20	N	N	N	N	<5	N	15	10	N	1,000	N
VRH114	<10	5	30	N	N	N	N	<5	N	20	20	N	500	N
VRH115	10	7	20	N	N	N	N	<5	N	30	20	N	500	5

Sample	X coordinate	Y coordinate	Fe-pct.s	Mg-pct.s	Ca-pct.s	Ti-pct.s	Mn-ppms	Ag-ppms	B-ppms	Ba-ppms	Be-ppms	Co-ppms
VRH116	619,590	4,190,800	15.00	.03	.10	.030	200	N	10	200	2.0	N
VRH117	615,600	4,188,450	20.00	.15	<.05	.150	150	N	100	200	2.0	5
VRH118	615,815	4,188,740	.50	<.02	<.05	.030	100	<.5	20	70	<1.0	N
VRH119	616,685	4,189,780	.50	.05	<.05	.500	50	<.5	50	100	1.0	N
VRH120	617,565	4,190,880	.50	<.02	<.05	.020	1,500	<.5	<10	300	1.0	N
VRH121	617,195	4,189,270	7.00	.20	.05	.700	300	N	200	200	1.5	10
VRH122	620,740	4,192,740	.10	.05	<.05	.100	50	N	200	70	<1.0	N
VRH123	621,885	4,194,190	15.00	<.02	<.05	.150	150	2.0	50	200	2.0	N
VRH125	622,280	4,193,300	7.00	1.50	.05	.700	500	N	700	1,000	5.0	20
VRH126	620,930	4,192,020	1.50	.70	<.05	.700	150	<.5	700	1,000	3.0	N
VRH127	621,340	4,192,700	20.00	.20	.05	.150	1,500	<.5	100	3,000	7.0	10
VRH128	622,910	4,194,380	7.00	.03	<.05	.050	>5,000	N	70	3,000	10.0	>2,000
VRH130	619,760	4,189,630	1.00	1.00	.20	1.000	100	3.0	1,000	2,000	3.0	N
VRH131	623,020	4,194,240	20.00	.15	.07	.100	2,000	N	50	300	7.0	50
VRH132	623,020	4,194,240	>20.00	.15	N	.100	>5,000	N	70	1,000	10.0	50
VRH133	623,020	4,194,240	>20.00	<.02	N	.010	500	N	N	150	1.0	20
VRH134	623,020	4,194,240	15.00	<.02	<.05	.020	500	N	10	100	1.0	30
VRH201	620,350	4,191,970	15.00	.07	.10	.070	1,000	N	50	150	2.0	15
VRH202	620,350	4,191,970	10.00	.05	<.05	.150	200	N	50	100	2.0	N
VRH203	620,350	4,191,970	15.00	.20	<.05	.300	150	N	150	300	3.0	7
VRH204	620,350	4,191,970	.50	.05	<.05	.200	150	N	150	100	<1.0	N
VRH205	619,770	4,190,350	20.00	<.02	<.05	.010	1,000	<.5	N	<20	3.0	30
VRH206	619,395	4,189,870	20.00	1.00	<.05	.700	>5,000	N	700	700	7.0	100
VRH208	619,260	4,190,060	.15	.05	<.05	.050	100	N	100	50	<1.0	N
VRH209	619,270	4,190,460	.05	<.02	<.05	.010	30	N	70	100	<1.0	N
VRH210	619,030	4,190,600	2.00	.70	.07	.700	300	N	150	500	3.0	7
VRH211	619,070	4,189,860	15.00	.07	.07	.100	500	N	20	100	2.0	N
VRH213	618,120	4,188,710	.70	.03	<.05	.200	70	N	200	300	<1.0	N
VRH216	617,885	4,189,940	1.00	.03	<.05	.050	150	N	200	70	1.0	N
VRH222	620,360	4,192,780	.70	.05	<.05	.500	100	<.5	30	200	<1.0	N
VRH223	622,215	4,194,870	.15	<.02	<.05	.050	<10	N	150	20	<1.0	N
VRH224	623,075	4,194,980	1.00	.02	<.05	.100	150	N	150	70	1.0	N
VRH228	621,520	4,195,130	5.00	1.50	<.05	.500	700	<.5	700	1,000	5.0	20
VRH300	623,540	4,195,130	.20	.02	<.05	.020	>5,000	N	10	700	1.0	30
VRH302	620,080	4,192,380	1.50	.50	<.05	.500	700	N	300	500	2.0	7
VRH303	620,080	4,192,380	1.00	.20	<.05	.500	150	N	150	500	1.5	N
VRH304	620,080	4,192,380	.70	.10	<.05	.300	70	N	100	300	<1.0	N
VRH305	620,570	4,192,400	.50	.02	<.05	.150	50	N	100	50	<1.0	N
VRH306	620,570	4,192,400	.70	.02	<.05	.150	50	N	200	150	<1.0	N
VRH307	619,450	4,190,620	10.00	.05	<.05	.200	150	N	30	100	1.5	N
VRH308	619,220	4,190,760	5.00	2.00	<.05	1.000	700	N	500	700	3.0	20
VRH310	619,780	4,190,420	20.00	<.02	<.05	.050	5,000	1.0	<10	500	3.0	15
VRH314	620,090	4,191,330	15.00	.15	.20	.150	200	N	70	300	3.0	N
VRH315	620,060	4,191,340	10.00	.05	.15	.070	100	N	20	200	2.0	N
VRH316	620,100	4,191,340	7.00	.02	<.05	.150	2,000	N	200	200	2.0	5

Sample	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Zn-ppm aa
VRH116	N	5	N	N	N	N	N	5	N	50	20	N	100	10
VRH117	20	5	100	N	N	30	70	15	100	150	100	N	700	20
VRH118	N	<5	20	N	N	N	N	N	N	<10	10	N	70	N
VRH119	<10	<5	20	N	N	N	N	<5	N	20	15	N	100	N
VRH120	N	5	20	N	N	N	N	N	N	<10	<10	N	70	N
VRH121	30	7	150	N	N	20	N	7	150	70	70	N	1,000	10
VRH122	N	<5	20	N	N	N	N	<5	N	10	10	N	300	N
VRH123	10	<5	N	N	N	10	<10	10	<100	70	100	N	700	N
VRH125	100	50	70	N	N	70	10	20	N	150	50	N	100	75
VRH126	100	50	70	10	N	20	150	20	100	200	50	N	70	N
VRH127	30	70	100	N	N	200	500	7	<100	100	100	700	200	700
VRH128	10	700	N	N	N	5,000	70	N	N	30	150	2,000	50	2,000
VRH130	150	50	50	15	N	50	100	20	150	1,000	30	N	100	5
VRH131	50	20	200	N	N	700	300	10	N	100	300	1,500	300	1,200
VRH132	20	50	N	N	N	500	150	5	100	50	100	1,500	70	170
VRH133	20	5	N	N	N	300	<10	N	N	30	30	500	70	350
VRH134	30	7	N	N	N	150	10	N	N	50	20	200	150	200
VRH201	10	30	30	N	N	30	<10	10	<100	70	70	N	700	20
VRH202	20	5	N	N	N	20	N	5	N	50	50	N	150	10
VRH203	20	15	30	N	N	30	<10	10	<100	100	50	N	150	5
VRH204	20	<5	50	N	N	N	N	<5	N	15	50	N	700	N
VRH205	20	5	N	N	N	300	20	N	N	10	15	700	30	430
VRH206	50	100	150	N	N	200	150	30	<100	200	100	1,000	150	570
VRH208	N	<5	30	N	N	N	<10	<5	N	10	<10	N	>1,000	N
VRH209	N	<5	30	N	N	N	<10	N	N	<10	<10	N	200	N
VRH210	30	15	50	N	N	10	10	7	<100	70	30	N	500	30
VRH211	10	30	N	N	N	10	N	7	<100	50	150	N	100	5
VRH213	10	<5	20	N	N	N	<10	5	<100	30	20	N	>1,000	N
VRH216	N	<5	20	N	N	N	N	<5	N	15	<10	N	700	5
VRH222	10	5	20	N	N	N	N	<5	N	20	20	N	100	N
VRH223	N	<5	20	N	N	N	N	<5	N	<10	15	N	700	N
VRH224	N	5	20	N	N	N	<10	5	N	10	15	N	>1,000	N
VRH228	100	70	50	N	N	100	100	15	<100	300	30	N	100	120
VRH300	N	5	20	N	N	50	N	N	N	10	10	N	70	50
VRH302	30	20	100	N	N	10	10	7	<100	50	20	N	150	10
VRH303	20	7	20	N	N	N	<10	5	<100	50	20	N	700	5
VRH304	10	5	20	N	N	N	N	<5	N	30	15	N	700	5
VRH305	10	N	20	N	N	N	N	<5	N	<10	10	N	>1,000	N
VRH306	N	7	20	N	N	N	N	<5	N	<10	10	N	>1,000	N
VRH307	10	5	20	N	N	10	N	5	N	70	50	N	150	5
VRH308	70	30	100	N	N	50	50	15	N	100	30	N	100	70
VRH310	N	20	N	N	N	100	150	N	N	30	<10	1,000	50	380
VRH314	20	7	30	N	N	10	<10	7	<100	70	100	N	500	10
VRH315	20	5	N	N	N	N	N	5	N	50	30	N	100	10
VRH316	15	<5	100	N	N	N	N	7	100	100	50	N	700	10

Rich Hole - Rocks--continued

Sample	X coordinate	Y coordinate	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	B-ppm s	Ba-ppm s	Be-ppm s	Co-ppm s
VRH317	620,060	4,191,340	10.00	.05	.20	.150	200	N	100	150	1.5	5
VRH318	620,060	4,191,340	10.00	.10	.15	.150	100	N	100	200	2.0	5
VRH319	620,060	4,191,340	10.00	.10	.15	.150	100	N	150	200	2.0	5
VRH320	620,020	4,191,400	3.00	.20	<.05	1.000	2,000	N	500	700	2.0	20
VRH321	619,840	4,191,480	7.00	10.00	10.00	.300	>5,000	N	200	1,000	1.5	10
VRH322	619,420	4,192,520	5.00	.10	<.05	.300	700	N	300	200	1.5	N
VRH323	619,820	4,191,280	10.00	.07	.15	.070	100	N	150	100	2.0	N
VRH324	618,640	4,188,780	20.00	.10	N	.070	>5,000	N	200	500	5.0	30
VRH325	620,280	4,195,360	10.00	.02	<.05	.100	300	N	20	500	2.0	N
VRH326	619,180	4,193,080	10.00	.03	<.05	.200	200	N	100	150	1.0	N
VRH327	621,890	4,193,640	.50	.03	.07	.150	200	N	150	100	<1.0	N
VRH328	620,880	4,191,950	.70	.70	<.05	.500	50	5.0	500	2,000	2.0	N
VRH329	621,310	4,193,680	>20.00	.30	N	.200	100	N	150	1,000	10.0	20
VRH330	623,040	4,194,350	20.00	.10	N	.050	>5,000	N	70	700	5.0	50
VRH331	622,860	4,194,420	.50	.50	20.00	.100	500	N	100	70	1.0	N
VRH332	621,010	4,196,400	.70	<.02	<.05	.030	>5,000	N	10	3,000	1.5	2,000
VRH334	621,630	4,197,600	.20	.02	<.05	.050	100	N	100	70	<1.0	N
VRH335	621,610	4,197,180	1.50	.70	.05	.700	100	5.0	1,000	3,000	3.0	N
VRH336	623,060	4,196,100	>20.00	.07	<.05	.070	5,000	N	50	1,000	3.0	30

Rich Hole - Rocks--continued

Sample	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Zn-ppm aa
VRH317	20	10	30	N	N	10	<10	7	N	70	70	N	300	15
VRH318	20	7	50	N	N	20	N	7	N	100	50	N	100	5
VRH319	30	5	50	N	N	10	<10	7	100	70	50	N	200	5
VRH320	50	10	70	N	20	30	<10	10	150	70	50	N	1,000	15
VRH321	70	200	70	<5	N	30	30	10	200	70	50	N	50	50
VRH322	50	7	70	N	N	N	20	5	200	50	100	300	>1,000	220
VRH323	30	<5	30	N	N	10	<10	5	<100	70	50	N	300	5
VRH324	30	30	N	N	N	70	10	5	N	30	20	200	50	65
VRH325	10	7	N	N	N	15	<10	5	<100	70	50	N	200	10
VRH326	20	<5	70	N	N	10	<10	7	N	50	50	N	200	35
VRH327	N	5	20	N	N	N	N	5	N	<10	15	N	>1,000	N
VRH328	100	20	70	15	N	50	200	10	100	1,500	50	N	70	N
VRH329	30	30	N	N	N	70	70	20	<100	150	50	N	70	35
VRH330	20	20	N	N	N	200	30	5	N	50	10	1,000	30	90
VRH331	20	<5	20	10	N	N	70	<5	150	20	10	<200	50	210
VRH332	N	500	N	N	N	1,000	<10	N	N	100	30	2,000	100	1,500
VRH334	10	<5	20	N	N	N	N	N	N	10	10	N	500	N
VRH335	100	70	50	10	N	<5	50	20	150	1,000	30	N	100	<5
VRH336	20	20	N	N	N	200	20	5	N	70	50	1,000	70	570

Rich Hole - Stream Sediments

Sample	X coordinate	Y coordinate	Fe-pct.s	Mg-pct.s	Ca-pct.s	Ti-pct.s	Mn-ppms	Ag-ppms	B-ppms	Ba-ppms	Be-ppms	Co-ppms
VRH002	620,575	4,191,500	2.0	.70	.07	.50	1,500	N	300	300	2.0	7
VRH022	617,760	4,191,900	5.0	.30	<.05	.50	300	N	150	700	3.0	70
VRH028	620,450	4,193,670	1.5	.15	<.05	.30	1,500	N	300	300	1.5	15
VRH029	621,360	4,194,780	3.0	1.00	.30	.70	2,000	N	200	700	3.0	30
VRH112	620,015	4,190,470	3.0	1.00	.30	.50	2,000	N	150	700	2.0	20
VRH124	623,115	4,194,360	3.0	.30	<.05	.30	5,000	2.0	150	500	3.0	70
VRH129	616,990	4,187,470	3.0	.50	.10	.50	1,500	N	300	700	2.0	20
VRH200	623,630	4,195,100	.7	.10	<.05	.20	1,000	N	150	100	1.5	20
VRH207	619,430	4,189,580	5.0	.30	.05	1.00	2,000	N	200	700	3.0	30
VRH212	618,640	4,188,420	.3	.05	<.05	.15	70	N	200	20	<1.0	N
VRH214	617,810	4,190,120	2.0	.15	<.05	.30	1,500	N	150	200	2.0	30
VRH215	617,900	4,189,940	1.5	.15	<.05	.30	1,500	N	200	300	2.0	30
VRH217	617,420	4,189,640	1.5	.15	<.05	.30	3,000	N	150	500	3.0	50
VRH218	617,700	4,189,250	1.0	.15	<.05	.30	700	N	300	150	1.0	20
VRH219	617,420	4,189,060	.2	.03	<.05	.15	500	N	150	70	<1.0	5
VRH220	617,230	4,188,320	3.0	.15	<.05	.30	1,000	N	200	300	1.5	10
VRH221	617,140	4,188,100	3.0	.30	.07	.30	1,000	N	200	1,500	2.0	30
VRH225	620,520	4,193,700	7.0	1.50	.15	.50	2,000	N	300	700	2.0	30
VRH226	620,610	4,194,000	1.5	.07	<.05	.20	500	N	150	200	1.5	10
VRH227	620,830	4,194,200	3.0	.50	.10	.30	1,000	N	150	500	1.5	20
VRH229	621,520	4,195,130	3.0	.30	.20	.30	2,000	N	200	700	3.0	50
VRH230	621,870	4,195,460	3.0	.30	<.05	.50	1,500	N	300	700	2.0	150
VRH301	621,650	4,192,960	5.0	.50	.05	.50	1,500	<.5	300	1,000	5.0	30
VRH309	619,880	4,190,320	7.0	.50	.10	.30	5,000	N	200	1,000	3.0	70
VRH311	619,635	4,189,940	5.0	.30	.10	.30	3,000	N	200	1,000	3.0	50
VRH312	619,040	4,188,660	1.0	.07	<.05	.20	700	N	200	100	1.0	5
VRH313	620,320	4,191,120	7.0	1.00	.30	.50	5,000	N	150	1,000	5.0	30
VRH333	621,980	4,196,140	.5	.05	<.05	.15	700	N	150	100	1.5	7
VRH337	622,880	4,196,170	2.0	.15	.07	.20	2,000	N	200	700	5.0	30

Rich Hole - Stream Sediments

Sample	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sr-ppm s	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Zn-ppm aa
VRH002	20	10	50	N	N	20	150	7	N	70	50	200	1,000	300
VRH022	20	20	70	N	N	15	30	10	<100	70	50	N	1,000	50
VRH028	<10	7	N	N	N	10	30	7	N	30	30	N	1,000	20
VRH029	30	30	70	N	N	50	30	15	<100	100	70	N	1,000	95
VRH112	20	20	50	N	N	50	50	10	<100	70	70	<200	>1,000	130
VRH124	30	15	30	N	N	200	70	10	N	70	50	500	500	300
VRH129	50	50	50	<5	<20	70	70	10	N	100	30	<200	300	230
VRH200	N	<5	N	N	N	10	15	<5	N	20	20	N	500	50
VRH207	30	20	70	5	N	70	70	15	<100	70	70	<200	1,000	120
VRH212	N	<5	N	N	N	N	10	N	N	15	15	N	500	20
VRH214	<10	5	50	N	N	10	10	5	N	30	30	N	1,000	30
VRH215	10	5	N	N	N	10	15	7	N	30	30	N	1,000	20
VRH217	10	15	N	N	N	50	10	7	N	30	30	N	1,000	40
VRH218	<10	5	N	N	N	10	<10	5	N	30	20	N	500	20
VRH219	N	<5	N	N	N	N	N	N	N	10	15	N	1,000	25
VRH220	20	7	50	N	N	20	10	7	<100	50	50	N	>1,000	35
VRH221	15	50	N	10	N	100	50	10	N	150	30	200	1,000	350
VRH225	50	30	50	N	<20	50	50	15	<100	150	30	N	300	100
VRH226	10	5	N	N	N	<5	15	<5	N	30	50	N	500	20
VRH227	20	7	30	N	N	30	15	7	N	70	20	N	300	75
VRH229	20	30	50	N	N	100	100	10	<100	70	50	<200	1,000	200
VRH230	30	20	100	<5	50	15	70	15	<100	100	50	N	700	50
VRH301	30	70	50	10	N	100	150	10	<100	150	50	200	300	340
VRH309	30	30	50	N	N	150	70	10	<100	150	50	200	300	280
VRH311	30	50	70	<5	<20	100	150	10	<100	70	50	200	300	220
VRH312	<10	<5	N	N	N	10	20	N	N	20	15	N	>1,000	30
VRH313	30	30	50	N	<20	100	70	10	100	70	50	300	500	250
VRH333	<10	<5	N	N	N	N	20	N	N	15	15	N	1,000	35
VRH337	20	20	N	10	N	100	30	5	N	100	20	200	500	260