UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analytical results and sample locality map of stream-sediment and heavy-mineral-concentrate samples from the Little Wood River (ID-053-004) Wilderness Study Area, Blaine County, Idaho

By

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STUDIES RELATED TO WILDERNESS

Bureau of Land Management Wilderness Study Area

The Wilderness Act (Public Law 88-577, September 3, 1964) and any 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 potential. Results must be available to the public and be submitted to the President and Congress. This report presents the results of the geochemical survey of the Little Wood River (ID-053-004) Wilderness Study Area (WSA), Blaine County, Idaho.

INTRODUCTION

In June, 1987, the U.S. Geological Survey conducted a reconnaissance geochemical survey of the Little Wood River WSA (ID-053-004), Blaine County, Idaho.

The Little Wood River study area consists of 4,385 acres, and is located adjacent to the southern boundary of the Boulder-Pioneer WSA. The study area lies approximately 20 miles east of Hailey and 32 miles southeast of Ketchum. Access to the study area is possible from the town of Carey to the south and from the town of Belleview to the west by unimproved county roads and jeep trails (fig. 1).

The study area lies at the southern end of the Boulder-Pioneer Mountains. The elevations range from 5,600 ft in the Little Wood River valley to 8,000 ft in the northwest part of the area. The oldest unit in the study area is the Devonian Milligen Formation, which is present in the western end of the study area. The Milligen consists dominantly of carbonaceous to siliceous argillite, phyllitic argillite, fine-grained quartzite, siltite,and micritic limestone. The Middle Pennsylvanian to Lower Permian Wood River Formation is in thrust contact with the underlying Milligen Formation (Sanford and others, 1988). The Wood River Formation consists of grey shaly to massive limestone, calcareous siltstone and sandy limestone, quartzite, siltite, and chert. The Tertiary Challis Volcanics unconformably overlie the Wood River Formation and consists of tuff, tuff breccia, and andesite, dacite, and rhyolite flows. Quaternary alluvial deposits are found along the Little Wood River valley.

METHODS OF STUDY

Sample Media

Analyses of the stream-sediment samples represent the chemistry of rock material eroded from drainage basins upstream from each sample site. Such information is useful in identifying those basins which contain concentrations of elements that may be related to mineral deposits. Heavy-mineral-concentrate samples provide information about the chemistry of certain minerals in rock material eroded from the drainage basin upstream from each sample site. The selective concentration of minerals, many of which may be ore related, permits determination of some elements that are not easily detected in stream-sediment samples.

Sample Collection

Twenty-one stream-sediment and twenty-one heavy-mineral-concentrate samples were collected from the study area. Average sampling density was about three samples per 1 mi^2 for the stream-sediment and heavy-mineral-concentrate samples. The approximate area of the drainage basins sampled ranged from 1/8 mi^2 to 1 1/4 mi^2. The locations of stream-sediment and heavy-mineral-concentrate samples are plotted on figure 2.

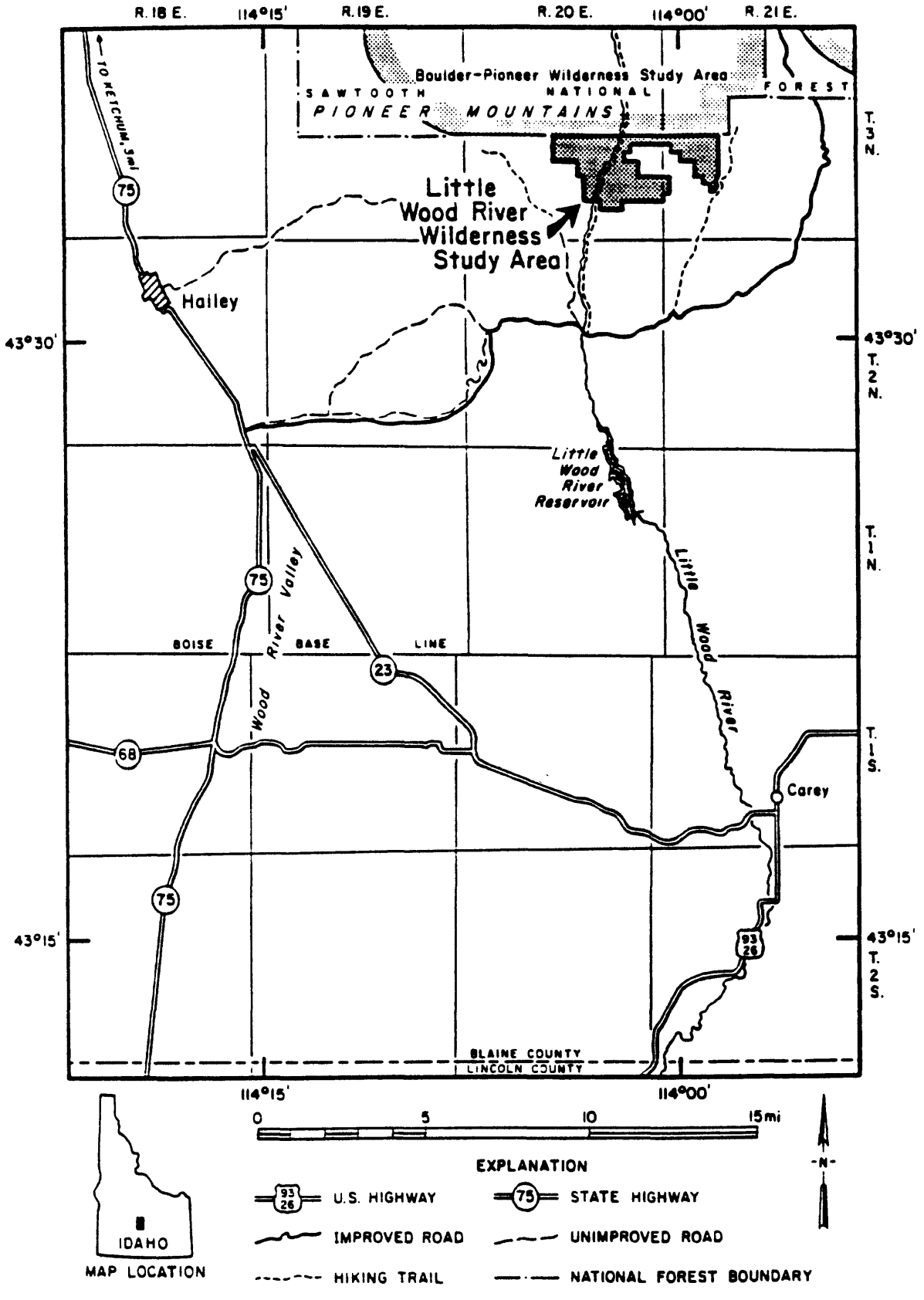

Figure 1. Location of the Little Wood River WSA, Blaine County, Idaho.

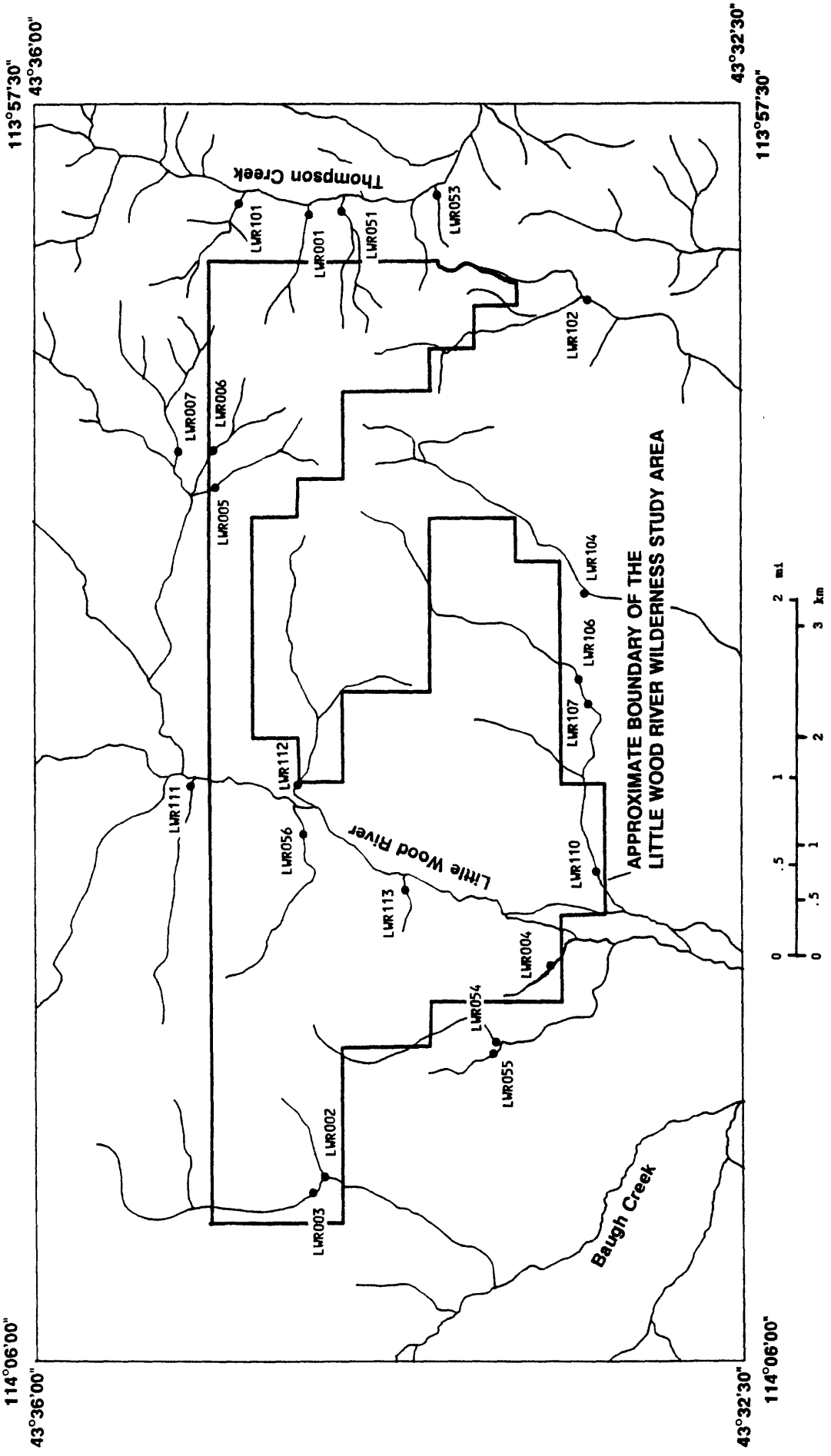

Figure 2. Localities of stream-sediment and heavy-mineral-concentrate samples from the Little Wood River WSA, Blaine County, Idaho.

Stream-sediment samples

The stream-sediment samples were collected from first-order(unbranched), second-order(below the junction of two first-order), third-order(below the junction of two second-order), active and intermittent streams as shown on USGS topographic maps (scale = 1:24,000). Most of the streams were flowing when samples were collected. Each sample was composited from several localities within an area that may extend as much as 10 feet from the site plotted on the map.

Heavy-mineral-concentrate samples

Heavy-mineral-concentrate samples were collected from the same active alluvium as the stream-sediment samples. Each bulk sample was screened with a 2.0-mm (10-mesh) screen to remove the coarse material. The less than 2.0-mm fraction was panned until most of the quartz, feldspar, organic material, and clay-sized material was removed.

Sample Preparation

The stream sediments were air dried, then sieved using 80-mesh (0.17-mm) stainless-steel sieves. The portion of the sediment passing through the sieve was saved for analysis.

After air drying and sieving to -35 mesh, bromoform (specific gravity 2.85) was used to remove the remaining quartz and feldspar from the heavy-mineral-concentrate samples that had been panned in the field. The resultant heavy-mineral sample was separated into three fractions using a large electromagnet (in this case a modified Frantz Isodynamic Separator) by placing the sample in contact with the face of the magnet. The most magnetic material (removed at a setting of 0.25 ampere), consisting primarily of magnetite, was not analyzed. The second fraction (removed at a setting of 1.75 ampere), largely ferromagnesian silicates and iron oxides, was saved for analysis/archival storage. The third fraction (the nonmagnetic fraction which may include the ore minerals, zircon, sphene, etc.) was split using a Jones splitter for analysis. One split was hand ground for spectrographic analysis; the other split was saved for mineralogical analysis. The magnetic separates are the same as would be produced by using a Frantz Isodynamic Separator set at a slope of 15° and a tilt of 10° with a current of 0.2 ampere to remove the magnetite and ilmenite, and a current of 0.6 amperes to split the remainder of the sample into paramagnetic and nonmagnetic fractions.

Sample analysis

Spectrographic method

The stream-sediment and heavy-mineral-concentrate samples were analyzed for 35 elements using a semiquantitative, direct-current arc emission spectrographic method (Grimes and Marranzino, 1968). The elements determined and their lower limits of determination are listed in table 1. Spectrographic results were obtained by visual comparison of spectra derived from the sample against spectra obtained from standards made from pure oxides and carbonates. Standard concentrations are geometrically spaced over any given order of magnitude of concentration as follows: 100, 50, 20, and so forth. Samples whose concentrations are estimated to fall between those values are assigned values of 70, 30, 15, and so forth. The precision of the analytical method is approximately plus or minus one reporting interval at the 83 percent confidence level (Motooka and Grimes, 1976). Values determined for the major elements (iron, magnesium, calcium, and titanium) are given in weight percent; all others are given in parts per million (micrograms/gram). Analytical data for samples from the Little Wood River study area is listed in tables 3 and 4.

Chemical methods

To compliment the spectrographic method, inductively coupled plasma atomic emission spectroscopy (ICP) was used for the determination of arsenic (As), bismuth (Bi), cadmium (Cd), antimony (Sb), and zinc (Zn). Limits of determination and references are listed in table 2. Analytical results using this method for stream-sediment samples are listed following the spectrographic data in table 3.

ROCK ANALYSIS STORAGE SYSTEM

Upon completion of all analytical work, the analytical results were entered into a computer-based file called Rock Analysis Storage System (RASS). This data base contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and converted to a binary form (STATPAC) for computerized statistical analysis or publication (VanTrump and Miesch, 1977).

DESCRIPTION OF DATA TABLES

Tables 3 and 4 list the results of analyses of stream-sediment and heavy-mineral-concentrate samples, respectively, for the Little Wood River WSA. In both tables, the data are arranged so that column 1 contains the USGS-assigned sample numbers. These numbers correspond to the numbers shown on the site location map (fig. 2). The letter (C or S) at the end of the sample location number, represents the type of sample analyzed. For example, LWR101C represents a heavy-mineral-concentrate sample and LWR101S represents a stream-sediment sample. Columns in which element headings show the letter "s" below the element symbol denote emission spectrographic analyses, and "icp" denotes inductively coupled atomic emission spectrography. A letter "N" in the tables indicates that a given element was looked for but not detected at the lower limit of determination shown for that element in tables 1 or 2. For emission spectrographic analyses, a "less than" symbol (<) entered in the tables before the lower limit of detection indicates that an element was observed but was below the lowest reporting value. For ICP analyses, a "less than" symbol (<) before the lower limit of detection indicates that the element was below the lowest reporting value. If an element was observed but was above the highest reporting value, a "greater than" symbol (>) was entered in the tables before the upper limit of detection. Because of the formatting used in the computer program that produced tables 3 and 4, some of the elements listed in these tables (Fe, Mg, Ca, Ti, Ag, and Be) may carry one or more nonsignificant digits to the right of the significant digits. The analysts did not determine these elements to the accuracy suggested by the extra zeros.

REFERENCES CITED

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VanTrump, George, Jr., and Miesch, A.T., 1977, The U.S. Geological Survey RASS-STATPAC system for management and statistical reduction of geochemical data: Computers and Geosciences, v. 3, p. 475-488.

TABLE 1.--Limits of determination for the spectrographic analysis stream-sediments and heavy-mineral-concentrate samples

[The spectrographic limits of determination for stream-sediment samples are based on a 10-mg sample. The spectrographic limits of determination for heavy-mineral-concentrate samples are based on a 5-mg sample, and are therefore two reporting intervals higher than the limits given for stream sediments]

Elements	Lower determination limit	Upper determination limit
	Percent	
Iron (Fe)	0.05	20
Magnesium (Mg)	.02	10
Calcium (Ca)	.05	20
Titanium (Ti)	.00	21
Phosphorus (P)	0.2	10
Sodium (Na)	0.22	5
	Parts per million	
Manganese (Mn)	10	5,000
Silver (Ag)	0.5	5,000
Arsenic (As)	200	10,000
Gold (Au)	10	500
Boron (B)	10	2,000
Barium (Ba)	20	5,000
Beryllium (Be)	1	1,000
Bismuth (Bi)	10	1,000
Cadmium (Cd)	20	500
Cobalt (Co)	5	2,000
Chromium (Cr)	10	5,000
Copper (Cu)	5	20,000
Gallium (Ga)	5	500
Germanium (Ge)	10	100
Lanthanum (La)	20	1,000
Molybdenum (Mo)	5	2,000
Niobium (Nb)	20	2,000
Nickel (Ni)	5	5,000
Lead (Pb)	10	20,000
Antimony (Sb)	100	10,000
Scandium (Sc)	5	100
Tin (Sn)	10	1,000
Strontium (Sr)	100	5,000
Vanadium (V)	10	10,000
Tungsten (W)	50	10,000
Yttrium (Y)	10	2,000
Zinc (Zn)	200	10,000
Zirconium (Zr)	10	1,000
Thorium (Th)	100	2,000
Paladium (Pd)*	5	1,000
Platinum (Pt)*	20	1,000

* Determined in heavy-mineral-concentrate samples only. Limits are for heavy-mineral-concentrate-samples.

TABLE 2.-- Limits of determination for other chemical methods used for analysis of stream sediments

ICP = inductively coupled plasma spectroscopy]

Element or constituent determined	Sample type	Method	Determination limit (micrograms/ gram or ppm)	Reference
Arsenic (As)	S	ICP	5	Crock and others,
Antimony (Sb)	S	ICP	2	1987.
Zinc (Zn)	S	ICP	2	
Bismuth (Bi)	S	ICP	2	
Cadmium (Cd)	S	ICP	.1	

TABLE 3. RESULTS OF ANALYSES OF STREAM-SEDIMENT SAMPLES FROM THE LITTLE WOOD RIVER WILDERNESS STUDY AREA, BLAINE COUNTY, IDAHO

Sample	Latitude	Longitude	Fe %	Mg %	Ca %	Ti %	Mn ppm	Ag ppm	As ppm	Au ppm	B ppm
			s	s	s	s	s	s	s	s	s
LWR001S	43 34 38	113 58 14	10	3.0	2.0	1.0	2,000	N	N	N	10
LWR002S	43 34 35	114 4 45	7	1.0	2.0	1.0	1,000	2.0	N	N	100
LWR003S	43 34 38	114 4 52	5	1.0	3.0	.5	300	.7	N	N	50
LWR004S	43 33 27	114 3 19	5	.7	1.0	.5	1,000	.5	N	N	70
LWR005S	43 35 5	114 0 4	7	1.5	1.5	1.0	1,500	N	N	N	<10
LWR006S	43 35 6	113 59 50	7	1.5	2.0	.7	1,000	N	N	N	<10
LWR007S	43 35 16	113 59 50	5	1.5	2.0	.7	1,500	N	N	N	<10
LWR051S	43 34 29	113 58 12	7	1.0	2.0	1.0	1,500	N	N	N	<10
LWR053S	43 34 1	113 58 6	7	1.0	1.5	1.0	1,000	N	N	N	<10
LWR054S	43 33 43	114 3 50	7	1.0	1.5	1.0	500	N	N	N	70
LWR055S	43 33 45	114 3 54	5	3.0	3.0	.7	1,500	N	N	N	<10
LWR056S	43 34 40	114 2 25	5	1.0	1.5	.5	1,000	<.5	N	N	30
LWR101S	43 34 58	113 58 10	3	1.5	2.0	.5	1,000	N	N	N	N
LWR102S	43 33 16	113 58 4	7	3.0	1.0	1.0	1,000	N	N	N	10
LWR104S	43 33 17	114 0 48	5	2.0	1.5	.7	1,500	N	N	N	15
LWR106S	43 33 18	114 1 22	5	2.0	2.0	.7	1,000	N	N	N	10
LWR107S	43 33 16	114 1 33	5	1.5	2.0	.7	1,000	N	N	N	10
LWR110S	43 33 13	114 2 41	7	1.5	2.0	1.0	1,000	N	N	N	15
LWR111S	43 35 13	114 2 6	5	1.5	2.0	.7	1,000	N	N	N	<10
LWR112S	43 34 42	114 2 6	5	1.5	1.5	.7	1,500	N	N	N	50
LWR113S	43 34 0	114 2 48	5	.7	1.0	.5	1,000	<.5	N	N	70

TABLE 3. RESULTS OF ANALYSES OF STREAM-SEDIMENT SAMPLES FROM THE LITTLE WOOD RIVER WILDERNESS STUDY AREA, BLAINE COUNTY, IDAHO --Continued

Sample	Ba ppm s	Be ppm s	Bi ppm s	Cd ppm s	Co ppm s	Cr ppm s	Cu ppm s	La ppm s	Mo ppm s	Nb ppm s
LWR001S	1,500	2.0	N	N	30	500	100	50	<5	<20
LWR002S	1,000	2.0	N	N	20	150	100	50	30	20
LWR003S	1,000	1.5	N	N	10	70	30	50	<5	N
LWR004S	1,000	2.0	N	N	15	100	50	70	<5	<20
LWR005S	1,500	2.0	N	N	20	300	70	70	<5	<20
LWR006S	2,000	1.5	N	N	20	500	70	70	<5	<20
LWR007S	1,000	2.0	N	N	20	200	70	100	<5	<20
LWR051S	1,000	2.0	N	N	30	700	50	100	<5	20
LWR053S	1,500	1.5	N	N	20	1,000	50	70	<5	<20
LWR054S	1,500	2.0	N	N	15	200	30	70	10	<20
LWR055S	1,000	1.5	N	N	30	500	20	70	<5	<20
LWR056S	1,000	2.0	N	N	15	100	50	70	<5	<20
LWR101S	1,000	1.5	N	N	15	200	30	50	<5	<20
LWR102S	1,500	2.0	N	N	20	1,000	70	70	7	<20
LWR104S	1,500	2.0	N	N	15	150	70	70	5	<20
LWR106S	1,000	2.0	N	N	20	150	50	50	<5	<20
LWR107S	1,000	2.0	N	N	20	300	50	50	<5	<20
LWR110S	1,500	2.0	N	N	20	200	50	70	<5	20
LWR111S	1,500	2.0	N	N	10	200	10	50	<5	N
LWR112S	1,500	2.0	N	N	30	500	70	70	<5	<20
LWR113S	1,000	1.5	N	N	10	100	70	<50	7	N

TABLE 3. RESULTS OF ANALYSES OF STREAM-SEDIMENT SAMPLES FROM THE LITTLE WOOD RIVER WILDERNESS STUDY AREA, BLAINE COUNTY, IDAHO --Continued

Sample	Ni ppm s	Pb ppm s	Sb ppm s	Sc ppm s	Sn ppm s	Sr ppm s	V ppm s	W ppm s	Y ppm s	Zn ppm s
LWR001S	100	70	N	20	N	500	200	N	20	<200
LWR002S	200	70	N	15	N	200	1,000	N	30	500
LWR003S	50	30	N	7	N	300	300	N	15	200
LWR004S	50	50	N	10	N	500	200	N	15	<200
LWR005S	70	50	N	15	N	500	300	N	15	<200
LWR006S	70	50	N	15	N	700	200	N	15	<200
LWR007S	70	30	N	15	N	500	200	N	20	<200
LWR051S	100	50	N	15	N	500	300	N	20	<200
LWR053S	100	20	N	10	N	300	300	N	15	<200
LWR054S	70	30	N	7	N	500	300	N	10	<200
LWR055S	100	30	N	20	N	700	200	N	20	N
LWR056S	70	50	N	10	N	500	100	N	15	<200
LWR101S	70	50	N	10	N	700	100	N	10	<200
LWR102S	100	50	N	20	<10	300	300	N	20	<200
LWR104S	50	20	N	15	N	500	150	N	20	<200
LWR106S	50	30	N	10	N	500	200	N	15	<200
LWR107S	100	50	N	15	N	500	200	N	20	<200
LWR110S	100	20	N	15	N	500	200	N	20	<200
LWR111S	30	30	N	10	N	500	200	N	10	<200
LWR112S	100	20	N	20	N	500	200	N	15	<200
LWR113S	100	30	N	10	N	300	150	N	15	200

TABLE 3. RESULTS OF ANALYSES OF STREAM-SEDIMENT SAMPLES FROM THE LITTLE WOOD RIVER WILDERNESS STUDY AREA, BLAINE COUNTY, IDAHO --Ccontinued

Sample	Zr ppm s	Ga ppm s	Ge ppm s	Na % s	P % s	Th ppm s	As ppm icp	Bi ppm icp	Cd ppm icp	Sb ppm icp	Zn ppm icp
LWR001S	200	50	N	2.0	.2	N	<5	<2	.6	<2	63
LWR002S	500	30	N	1.0	.3	N	<5	<2	6.3	3	490
LWR003S	200	20	N	1.0	.2	N	<5	<2	2.4	<2	180
LWR004S	300	30	N	1.5	.2	N	<5	<2	1.3	<2	98
LWR005S	200	50	N	1.5	.2	N	<5	<2	1.1	<2	88
LWR006S	200	50	N	2.0	.2	N	<5	<2	.7	<2	69
LWR007S	200	50	N	1.5	.2	N	<5	<2	1.0	<2	81
LWR051S	200	50	N	2.0	.2	N	<5	<2	.5	<2	43
LWR053S	300	50	N	1.5	.2	N	<5	<2	52.0	<2	500
LWR054S	200	30	N	1.0	.2	N	15	<2	1.6	3	180
LWR055S	300	50	N	2.0	<.2	N	<5	<2	.7	<2	44
LWR056S	200	50	N	2.0	.2	N	<5	<2	.6	<2	83
LWR101S	100	30	N	2.0	<.2	N	<5	<2	.6	<2	42
LWR102S	300	50	N	1.0	.3	N	<5	<2	1.2	<2	92
LWR104S	500	20	N	1.0	.3	N	<5	<2	1.0	<2	100
LWR106S	300	50	N	1.5	<.2	N	<5	<2	.8	<2	84
LWR107S	300	50	N	1.5	.2	N	<5	<2	.9	<2	87
LWR110S	500	50	N	1.5	.3	N	<5	<2	.8	<2	73
LWR111S	500	50	N	2.0	<.2	N	<5	<2	.7	<2	83
LWR112S	300	30	N	1.0	.2	N	7	<2	1.1	<2	89
LWR113S	300	20	N	1.0	.2	N	<5	<2	1.7	<2	130

TABLE 4. RESULTS OF ANALYSES OF HEAVY-MINERAL-CONCENTRATE SAMPLES FROM THE LITTLE WOOD RIVER WILDERNESS STUDY AREA, BLAINE COUNTY, IDAHO

Sample	Latitude	Longitude	Fe %	Mg %	Ca %	Ti %	Mn ppm	Ag ppm	As ppm	Au ppm
			s	s	s	s	s	s	s	s
LWR001C	43 34 38	113 58 14	3.0	5.00	10	.50	500	N	N	N
LWR002C	43 34 35	114 4 45	1.5	.30	30	.20	100	N	N	N
LWR003C	43 34 38	114 4 52	5.0	1.00	20	2.00	300	N	N	N
LWR004C	43 33 27	114 3 19	2.0	.50	20	2.00	200	N	N	N
LWR005C	43 35 5	114 0 4	1.5	1.00	15	1.00	500	N	N	N
LWR006C	43 35 6	113 59 50	1.5	1.00	20	.70	500	N	N	N
LWR007C	43 35 16	113 59 50	.7	.30	10	.15	200	N	N	N
LWR051C	43 34 29	113 58 12	1.0	.30	7	1.00	200	N	N	N
LWR053C	43 34 1	113 58 6	2.0	2.00	30	.70	700	N	N	N
LWR054C	43 33 43	114 3 50	.2	.10	15	1.00	150	N	N	N
LWR055C	43 33 45	114 3 54	1.0	.50	10	.50	200	N	N	N
LWR056C	43 34 40	114 2 25	.5	.10	7	.70	200	N	N	N
LWR101C	43 34 58	113 58 10	.5	.70	10	.20	300	N	N	N
LWR102C	43 33 16	113 58 4	1.0	1.00	50	.20	700	N	N	N
LWR104C	43 33 17	114 0 48	1.0	.70	15	1.50	300	N	N	N
LWR106C	43 33 18	114 1 22	.5	.15	10	.20	500	N	N	N
LWR107C	43 33 16	114 1 33	.2	.20	10	.70	500	N	N	N
LWR110C	43 33 13	114 2 41	.2	.30	10	1.50	300	N	N	N
LWR111C	43 35 13	114 2 6	.2	.10	5	.50	200	N	N	N
LWR112C	43 34 42	114 2 6	2.0	1.50	20	1.50	500	N	N	N
LWR113C	43 34 0	114 2 48	1.5	1.50	15	>2.00	300	N	N	N

TABLE 4. RESULTS OF ANALYSES OF HEAVY-MINERAL-CONCENTRATE SAMPLES FROM THE LITTLE WOOD RIVER WILDERNESS STUDY AREA, BLAINE COUNTY, IDAHO --Continued

Sample	B ppm s	Ba ppm s	Be ppm s	Bi ppm s	Cd ppm s	Co ppm s	Cr ppm s	Cu ppm s	La ppm s	Mo ppm s
LWR001C	20	1,000	<2	N	N	20	1,000	10	700	<10
LWR002C	50	>10,000	<2	N	N	<20	200	15	2,000	<10
LWR003C	70	>10,000	5	N	N	<20	300	100	2,000	<10
LWR004C	50	1,000	2	N	N	<20	200	30	2,000	<10
LWR005C	30	>10,000	<2	N	N	<20	200	10	2,000	<10
LWR006C	<20	700	<2	N	N	<20	200	<10	>2,000	<10
LWR007C	<20	1,500	2	N	N	<20	70	<10	500	<10
LWR051C	20	1,000	2	N	N	<20	100	<10	500	<10
LWR053C	20	5,000	<2	N	N	<20	500	10	2,000	<10
LWR054C	50	>10,000	<2	N	N	<20	50	<10	500	<10
LWR055C	<20	2,000	2	N	N	<20	70	<10	500	<10
LWR056C	20	1,000	<2	N	N	<20	20	<10	300	<10
LWR101C	<20	1,000	3	N	N	<20	150	<10	700	<10
LWR102C	<20	2,000	<2	N	N	<20	100	<10	2,000	<10
LWR104C	20	>10,000	<2	N	N	<20	150	10	1,500	<10
LWR106C	<20	1,500	<2	N	N	<20	20	<10	1,000	<10
LWR107C	20	500	<2	N	N	<20	30	<10	1,500	<10
LWR110C	30	700	3	N	N	<20	50	<10	1,000	<10
LWR111C	<20	1,000	<2	N	N	<20	20	<10	500	200
LWR112C	20	7,000	<2	N	N	<20	300	10	1,000	<10
LWR113C	100	5,000	<2	N	N	<20	200	15	500	<10

TABLE 4. RESULTS OF ANALYSES OF HEAVY-MINERAL-CONCENTRATE SAMPLES FROM THE LITTLE WOOD RIVER WILDERNESS STUDY AREA, BLAINE COUNTY, IDAHO --Continued

Sample	Nb ppm s	Ni ppm s	Pb ppm s	Sb ppm s	Sc ppm s	Sn ppm s	Sr ppm s	V ppm s	W ppm s
LWR001C	N	70	20	N	20	N	2,000	100	<50
LWR002C	N	50	30	N	10	N	3,000	700	<50
LWR003C	N	30	<20	N	70	200	2,000	200	<50
LWR004C	N	20	<20	N	70	N	2,000	300	<50
LWR005C	N	15	20	N	70	N	1,000	70	<50
LWR006C	N	100	20	N	15	N	2,000	70	<50
LWR007C	N	15	20	N	20	N	2,000	50	<50
LWR051C	N	20	2,000	N	15	N	2,000	100	<50
LWR053C	<50	30	<20	N	70	N	2,000	100	<50
LWR054C	N	15	70	N	20	N	2,000	100	<50
LWR055C	N	30	50	N	50	N	3,000	30	<50
LWR056C	N	10	<20	N	15	N	700	30	<50
LWR101C	N	50	20	N	30	N	1,000	20	<50
LWR102C	N	20	<20	N	20	N	2,000	30	<50
LWR104C	N	30	<20	N	30	N	3,000	50	<50
LWR106C	N	10	<20	N	50	150	1,000	20	<50
LWR107C	N	20	20	N	70	N	1,000	30	<50
LWR110C	N	15	<20	N	70	N	1,000	50	<50
LWR111C	N	10	70	N	50	N	1,500	<20	50
LWR112C	<50	20	50	N	15	20	1,000	100	<50
LWR113C	70	20	3,000	N	70	200	700	150	<50

TABLE 4. RESULTS OF ANALYSES OF HEAVY-MINERAL-CONCENTRATE SAMPLES FROM THE LITTLE WOOD RIVER WILDERNESS STUDY AREA, BLAINE COUNTY, IDAHO --Continued

Sample	Y ppm s	Zn ppm s	Zr ppm s	Ga ppm s	Ge ppm s	Na % s	P % s	Th ppm s	Pt ppm s	Pd ppm s
LWR001C	200	N	>2,000	20	N	3.0	5	N	N	N
LWR002C	500	N	>2,000	<10	N	<.5	20	N	N	N
LWR003C	700	N	>2,000	<10	N	<.5	20	<200	N	N
LWR004C	700	N	>2,000	10	N	<.5	15	<200	N	N
LWR005C	300	N	>2,000	15	N	.5	15	N	N	N
LWR006C	500	N	>2,000	20	N	2.0	15	N	N	N
LWR007C	200	N	>2,000	50	N	5.0	3	N	N	N
LWR051C	300	N	>2,000	20	N	1.0	5	N	N	N
LWR053C	500	N	>2,000	<10	N	<.5	20	N	N	N
LWR054C	500	N	>2,000	<10	N	<.5	10	N	N	N
LWR055C	150	N	>2,000	70	N	5.0	3	N	N	N
LWR056C	200	N	>2,000	5	N	1.5	2	N	N	N
LWR101C	200	N	>2,000	20	N	3.0	7	N	N	N
LWR102C	300	N	>2,000	<10	N	<.5	20	N	N	N
LWR104C	200	N	>2,000	N	N	<.5	15	N	N	N
LWR106C	500	N	>2,000	10	N	.5	7	N	N	N
LWR107C	500	N	>2,000	10	N	.5	7	N	N	N
LWR110C	500	N	>2,000	10	N	<.5	15	N	N	N
LWR111C	200	N	>2,000	20	N	1.0	5	N	N	N
LWR112C	200	N	>2,000	<10	N	<.5	15	N	N	N
LWR113C	300	N	>2,000	10	N	<.5	10	500	N	N