UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analytical results and sample locality map of stream-sediment, heavy-mineral-concentrate, and rock samples from the Disaster Peak Wilderness Study Area (OR-003-153/NV-020-859), Harney and Malheur Counties, Oregon, and Humboldt County, Nevada

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CONTENTS

ILLUSTRATIONS

TABLES

STUDIES RELATED TO WILDERNESS

Bureau of Land Management Wilderness Study Areas

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine their mineral values, if any. 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 Disaster Peak Wilderness Study Area (OR-3-153/ NV-2-859), Harney and Malheur Counties, Oregon, and Humboldt County, Nevada.

INTRODUCTION

In May 1985, the U.S. Geological Survey conducted a reconnaissance geochemical survey of the Disaster Peak Wilderness Study Area (OR-003-153/ NV-020-859), Harney and Malheur Counties, Oregon, and Humboldt County, Nevada.

The Disaster Peak Wilderness Study Area comprises about 30,195 acres (47.2 mi^2) in the southeast corner of Harney County, Oregon, the southwest corner of Malheur County, Oregon, and the northern portion of Humboldt County, Nevada. The study area lies about 25 mi west of McDermitt, Nevada (see fig. 1).

The most direct access to the northern and eastern parts of the study area consists of a maintained unpaved road west of the paved Cordero mine road about 5 mi west of the town of McDermitt (fig. 1). This unpaved road, which roughly follows McDermitt Creek, forms the northern boundary of the study area and is intersected by several jeep trails that provide access to the central part of the study area. Access to the southern and southwestern parts of the study area is via a partly maintained, unpaved county and ranch road that follows the northeast side of the Kings River valley from the south (fig. 1). Several jeep trails extend northeast into the study area from this road, including a road following China Creek that forms part of the southeast boundary.

The topographic relief of the study area is about 4,000 ft with a maximum elevation of about 8,506 ft on the top of the high mesa in the north-central part of the area, and a minimum elevation of about 4,500 ft where China Creek crosses the southern boundary. Vegetation of the study area is similar to that growing elsewhere in mountain ranges of the northern Great Basin. Sage and seasonal desert grasses are common throughout the study area, and mountain mahogany and aspen grow in the more elevated parts.

The Disaster Peak Wilderness Study Area lies within the northwestern part of the Basin and Range province, an area characterized by north-trending, normal fault-bounded ranges and intervening basins. The oldest rocks in the area consist of Cretaceous granodiorite and subordinate amounts of other granite. These rocks are exposed in the southern part of the area known as The Granites.

An approximately flat-lying sequence of Tertiary volcanic and pyroclastic flows unconformably overlie the granitic rocks in the area and are exposed throughout most of the study area. The Long Ridge Caldera, located just east of the area, is a collapse structure resulting from the eruption of an ash-flow tuff that forms the top of the flow sequence. Numerous arcuate, north-northeast-striking caldera ring faults displace rocks in and near the northeastern part of the study area.

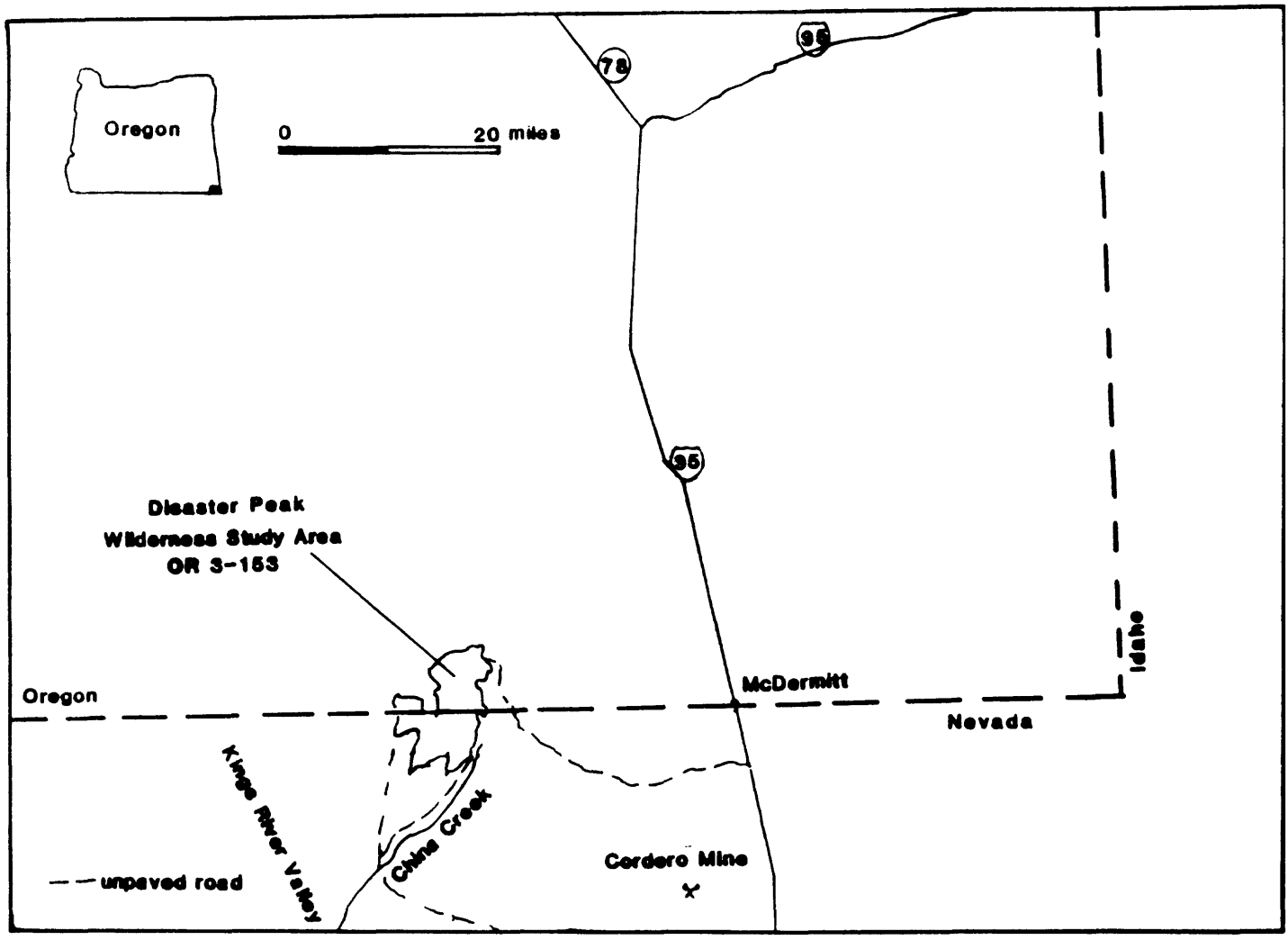

Figure 1. Location map of the Disaster Peak Wilderness Study Area (OR-3-153/ NV-2-859), Harney and Malheur Counties, Oregon, and Humboldt County, Nevada.

METHODS OF STUDY

Sample Media

Analyses of the stream-sediment samples represent the chemistry of the rock material eroded from the drainage basin 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.

Analyses of unaltered or unmineralized rock samples provide background geochemical data for individual rock units. Analyses of altered or mineralized rocks, where present, may provide useful geochemical information about the major- and trace-element assemblages associated with a mineralizing system.

Sample Collection

Heavy-mineral-concentrate and stream-sediment samples were collected at 37 sites (plate 1). Rock samples were collected at eight sites. Sampling density was about one sample site per 1.33 mi^2 for the stream sediments and heavy-mineral concentrates. The area of the drainage basins sampled ranged from .25 mi^2 to 4 mi^2.

Stream-sediment samples

The stream-sediment samples consisted of active alluvium collected primarily from first-order (unbranched) and second-order (below the junction of two first-order) streams as shown on USGS topographic map (plate 1). Each sample was composite from several localities within an area that may extend as much as 20 ft 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 were removed.

Sample Preparation

The stream-sediment samples 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 by placing the sample in contact with the face of the magnet (in this case a modified Frantz Isodynamic Separator). The most magnetic material

(removed at a setting of 0.25 ampere), primarily magnetite, was not analyzed. The second fraction largely ferromagnesian silicates and iron oxides, was saved for archival storage. The third fraction (nonmagnetic material which may include the nonmagnetic ore minerals, zircon, sphene, etc.) was split using a Jones splitter. One split was hand ground for spectrographic analysis; the other split was saved for mineralogical analysis.

Rock samples were crushed and then pulverized to minus 0.15 mm with ceramic plates.

Sample Analysis

Spectrographic method

The stream-sediment, heavy-mineral-concentrate, and rock samples were analyzed for 31 elements using a semiquantitative, direct-current arc emission spectrographic method (Grimes and Marranzino, 1968). The elements analyzed 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 geometricaly spaced over any given order of magnitude of concentration as follows: 100, 50, 20, 10, 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 and plus or minus two reporting intervals at the 96 percent confidence level (Motooka and Grimes, 1976). Values determined for the major elments, 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 Disaster Peak Wilderness Study Area are listd in tables 3, 4, and 5.

Chemical methods

Other analytical methods used on samples from the Disaster Peak Wilderness Study Area are summarized in table 2.

Analytical results for the stream-sediment and heavy-mineral-concentrate samples are listed in tables 3, 4, and 5, respectively.

DATA 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 for the samples of stream sediment and heavy-mineral concentrate, respectively. For the three 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 (plate 1). Columns in which the element headings show the letter "s" below the element symbol are emission spectrographic analyses; "aa" indicates atomic absorption analyses; "icp" indicates inductively coupled plasma-atomic emission spectroscopy. 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 table 1. For emission spectrographic analyses, a "less than" symbol (<) entered in the tables in front of the lower limit of determination indicates that an element was observed but was below the lowest reporting value. For AA and ICP analyses, a "less than" symbol (<) entered in the tables in front of the lower limit of determination inicates that an 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 in front of the upper limit of determination. If an element was not looked for in a sample, two dashes (--) are entered in tables 3 and 4 in place of an analytical value. 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) 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.

ACKNOWLEDGMENTS

A number of our colleagues also participated in the collection and analyses of these samples: Robert L. Turner, Scott A. Minor, Paul Briggs, J.G. Crock, David Fey, Alonzo Love, Kay Kennedy, and Carol Gent.

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TABLE 1.--Limits of determination for the spectrographic analysis of rocks and stream sediments, based on a 10-mg sample

[The spectrographic limits of determination for heavy-mineral-concentate samples are based on a 5-mg sample, and are therefore two reporting intervals higher than the limits given for rocks and 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)	.002		1
	Parts per million		
Manganese (Mn)	10		5,000
Silver (Ag)	0.5		5,000
Arsenic (As)	200	(700)	10,000
Gold (Au)	10	(15)	500
Boron (B)	10		2,000
Barim (Ba)	20		5,000
Beryllium (Be)	1		1,000
Bismuth (Bi)	10		1,000
Cadmium (Cd)	20	(30)	500
Cobalt (Co)	5		2,000
Chromium (Cr)	10		5,000
Copper (Cu)	5		20,000
Lanthanum (La)	20	(30)	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	(200)	2,000

TABLE 2.--Chemical methods used

[AA = atomic absorption; ICP = inductively coupled plasma-atomic spectroscopy]

Element or constituent determined	Sample type	Method	Determination limit (micrograms/ gram or ppm)	Reference
Gold (Au)	rock	AA	.1	Modification of Thompson and others, 1968.
Mercury (Hg)	rock	AA	0.02	Koirtyohann and Khalil, 1976.
Arsenic (As)	rock	ICP	5	Crock and others, 1983, and modification of O'Leary and Viets, 1986.
Antimony (Sb)	rock	ICP	2	
Zinc (Zn)	rock	ICP	2	
Bismuth (Bi)	rock	ICP	2	
Cadmium (Cd)	rock	ICP	0.1	

Table 3. Results of analyses of stream-sediment samples from the Disaster Peak Wilderness Study Area, Malheur County, Oregon, and Humbolt County, Nevada

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
86DP001	42 3 4	118 8 47	7	1.0	2.0	>1.0	1,000	N	N	N	70	1,000
86DP002	42 2 47	118 9 35	5	1.0	2.0	>1.0	1,500	N	N	N	50	700
86DP003	42 2 55	118 9 40	10	1.5	2.0	>1.0	1,000	N	N	N	50	700
86DP004	42 3 58	118 8 44	5	1.0	2.0	>1.0	1,000	N	N	N	50	700
86DP005	42 3 58	118 10 13	7	1.0	1.5	>1.0	1,000	N	N	N	30	500
86DP006	42 4 1	118 10 9	10	1.5	2.0	>1.0	1,000	N	N	N	30	500
86DP008	42 1 51	118 10 17	10	1.0	2.0	>1.0	1,000	N	N	N	50	1,000
86DP009	42 2 2	118 10 14	10	1.0	2.0	>1.0	1,000	N	N	N	30	700
86DP010	42 0 25	118 9 20	10	2.0	5.0	>1.0	1,000	N	N	N	15	500
86DP011	42 0 15	118 9 13	7	1.0	2.0	>1.0	1,000	N	N	N	100	700
86DP012	41 59 8	118 9 52	10	2.0	2.0	>1.0	1,000	N	N	N	10	300
86DP013	41 58 5	118 10 36	15	5.0	3.0	>1.0	1,000	N	N	N	10	200
86DP014	41 58 37	118 11 13	15	3.0	3.0	>1.0	1,000	N	N	N	20	200
86DP015	42 59 0	118 11 31	15	5.0	3.0	>1.0	1,000	N	N	N	20	200
86DP016	42 3 57	118 12 29	10	2.0	2.0	>1.0	1,000	N	N	N	15	700
86DP017	42 0 1	118 8 58	15	3.0	7.0	>1.0	1,500	N	N	N	10	200
86DP018	42 3 26	118 12 27	10	2.0	1.5	>1.0	1,000	N	N	N	50	1,000
86DP019	41 56 20	118 11 10	20	5.0	3.0	>1.0	1,000	N	N	N	70	300
86DP020	42 2 50	118 12 8	20	2.0	2.0	>1.0	2,000	N	N	N	30	1,000
86DP021	41 56 4	118 11 10	15	7.0	7.0	>1.0	1,000	N	N	N	10	500
86DP023	41 55 40	118 12 20	20	2.0	2.0	1.0	1,000	N	N	N	50	500
86DP025	41 57 5	118 13 30	15	3.0	2.0	1.0	1,000	N	N	N	20	500
86DP027	41 56 52	118 13 13	10	5.0	3.0	>1.0	1,000	N	N	N	<10	300
86DP029	41 56 34	118 14 18	7	1.5	2.0	.5	700	N	N	N	20	500
86DP031	41 56 28	118 14 35	10	1.0	1.0	>1.0	1,500	N	N	N	<10	1,000
86DP032	41 57 0	118 17 45	10	2.0	2.0	>1.0	1,000	N	N	N	<10	500
86DP033	41 58 0	118 17 7	10	2.0	2.0	>1.0	1,000	N	N	N	20	500
86DP034	41 58 33	118 16 45	10	1.5	3.0	>1.0	1,000	N	N	N	10	500
86DP035	41 58 43	118 16 20	10	2.0	2.0	>1.0	1,000	N	N	N	20	300
86DP036	41 58 30	118 15 20	10	3.0	2.0	>1.0	1,500	N	N	N	<10	500
86DP037S	42 0 53	118 11 23	10	3.0	2.0	>1.0	2,000	N	N	N	30	500
86DP038S	42 0 58	118 11 22	10	2.0	2.0	>1.0	2,000	N	N	N	20	700
86DP039S	41 59 32	118 14 24	7	1.5	2.0	>1.0	2,000	N	N	N	20	700
86DP040S	42 0 8	118 17 16	10	1.5	2.0	>1.0	1,000	N	N	N	30	500
86DP041S	41 59 20	118 17 22	10	2.0	2.0	>1.0	1,000	N	N	N	50	500
86DP042S	42 0 8	118 17 8	15	3.0	2.0	>1.0	1,500	N	N	N	50	500
86DP044S	42 0 7	118 15 53	10	2.0	2.0	>1.0	1,500	N	N	N	20	500

Table 3. Results of analyses of stream-sediment samples from the Disaster Peak Wilderness Study Area, Malheur County, Oregon, and Humbolt County, Nevada--Continued

Sample	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	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s
86DP001	2.0	N	N	20	70	70	50	N	<20	20	30	N	20	N
86DP002	2.0	N	N	20	70	70	70	N	<20	20	20	N	15	N
86DP003	2.0	N	N	20	50	70	50	N	<20	15	30	N	20	N
86DP004	2.0	N	N	15	50	50	100	N	<20	20	30	N	15	N
86DP005	1.5	N	N	20	20	50	30	N	N	10	30	N	20	N
86DP006	1.0	N	N	20	70	50	30	N	20	10	50	N	20	N
86DP008	1.5	N	N	30	50	50	50	N	<20	20	50	N	20	N
86DP009	1.0	N	N	30	50	50	30	N	N	20	15	N	20	N
86DP010	<1.0	N	N	50	100	100	N	N	<20	50	15	N	30	N
86DP011	1.0	N	N	20	50	50	50	N	N	50	20	N	20	N
86DP012	N	N	N	50	200	200	N	N	N	100	<10	N	20	N
86DP013	N	N	N	50	200	300	N	N	N	100	<10	N	30	N
86DP014	<1.0	N	N	50	200	200	N	N	N	100	N	N	30	N
86DP015	<1.0	N	N	50	200	300	N	N	N	100	<10	N	30	N
86DP016	<1.0	N	N	30	30	70	30	N	<20	20	50	N	20	N
86DP017	1.0	N	N	50	300	200	N	N	N	70	N	N	20	N
86DP018	1.0	N	N	30	20	70	N	N	<20	15	50	N	20	N
86DP019	<1.0	N	N	50	300	100	N	N	N	70	N	N	50	N
86DP020	<1.0	N	N	30	50	70	N	N	<20	15	30	N	20	N
86DP021	N	N	N	30	200	200	N	N	N	100	N	N	30	N
86DP023	<1.0	N	N	20	70	20	50	N	N	15	N	N	20	N
86DP025	1.0	N	N	30	100	100	30	N	N	30	<10	N	20	N
86DP027	<1.0	N	N	30	200	200	N	N	N	50	N	N	20	N
86DP029	1.0	N	N	20	20	20	50	N	N	7	20	N	15	N
86DP031	<1.0	N	N	30	15	50	N	N	20	20	20	N	30	N
86DP032	<1.0	N	N	30	100	150	N	N	<20	30	<10	N	30	N
86DP033	<1.0	N	N	30	200	150	N	N	N	50	10	N	30	N
86DP034	<1.0	N	N	30	200	100	N	N	N	50	10	N	30	N
86DP035	<1.0	N	N	30	300	100	N	N	N	50	<10	N	30	N
86DP036	<1.0	N	N	30	200	100	N	N	N	70	10	N	30	N
86DP037S	<1.0	N	N	50	150	150	N	N	<20	50	15	N	20	N
86DP038S	<1.0	N	N	30	150	150	N	N	<20	50	15	N	30	N
86DP039S	1.0	N	N	20	50	70	30	N	<20	20	20	N	20	N
86DP040S	1.0	N	N	50	100	200	30	N	<20	50	20	N	30	N
86DP041S	<1.0	N	N	30	100	150	N	N	<20	50	10	N	30	N
86DP042S	<1.0	N	N	50	100	150	N	N	<20	50	10	N	30	N
86DP044S	1.0	N	N	30	100	100	N	N	<20	30	15	N	20	N

Table 3. Results of analyses of stream-sediment samples from the Disaster Peak Wilderness Study Area, Malheur County, Oregon, and Humbolt County, Nevada--Continued

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Au-ppm aa	Hg-ppm icp	As-ppm icp	Bi-ppm icp	Cd-ppm icp	Sb-ppm icp	Zn-ppm icp
86DP001	500	150	N	15	<200	200	N	<.1	.04	--	--	--	--	--
86DP002	500	150	N	50	<200	200	N	<.1	.04	--	--	--	--	--
86DP003	500	200	N	50	<200	200	N	<.1	.04	--	--	--	--	--
86DP004	500	100	N	30	<200	200	N	<.1	.48	--	--	--	--	--
86DP005	500	150	N	70	<200	150	N	<.1	.69	--	--	--	--	--
86DP006	500	150	N	20	<200	200	N	<.1	.04	--	--	--	--	--
86DP008	500	150	N	30	<200	200	N	<.1	.03	--	--	--	--	--
86DP009	500	150	N	30	<200	150	N	<.1	.02	--	--	--	--	--
86DP010	500	200	N	20	<200	150	N	<.1	.03	--	--	--	--	--
86DP011	500	150	N	20	<200	150	N	<.1	.07	--	--	--	--	--
86DP012	300	200	N	30	<200	100	N	<.1	<.02	--	--	--	--	--
86DP013	500	300	N	20	<200	100	N	<.1	.03	--	--	--	--	--
86DP014	500	500	N	20	<200	100	N	<.1	.02	--	--	--	--	--
86DP015	500	300	N	20	<200	100	N	<.1	.16	--	--	--	--	--
86DP016	700	150	N	30	<200	150	N	<.1	.07	--	--	--	--	--
86DP017	500	500	N	30	<200	100	N	<.1	.04	--	--	--	--	--
86DP018	500	150	N	20	<200	100	N	<.1	.04	--	--	--	--	--
86DP019	500	500	N	30	<200	1,000	N	<.1	.04	--	--	--	--	--
86DP020	700	200	N	30	200	100	N	<.1	.03	--	--	--	--	--
86DP021	700	200	N	30	<200	100	N	<.1	.02	--	--	--	--	--
86DP023	700	300	N	30	<200	>1,000	N	<.1	<.02	--	--	--	--	--
86DP025	700	200	N	20	<200	200	N	<.1	<.02	--	--	--	--	--
86DP027	500	200	N	30	N	100	N	<.1	<.02	--	--	--	--	--
86DP029	700	150	N	15	N	500	N	<.1	.03	--	--	--	--	--
86DP031	200	200	N	30	N	200	N	<.1	.55	--	--	--	--	--
86DP032	500	300	N	20	N	200	N	<.1	<.02	--	--	--	--	--
86DP033	500	200	N	30	N	100	N	<.1	<.02	--	--	--	--	--
86DP034	500	200	N	20	N	100	N	<.1	<.02	--	--	--	--	--
86DP035	500	300	N	20	N	100	N	<.1	<.02	--	--	--	--	--
86DP036	500	200	N	20	N	100	N	--	.04	6	<2	.8	<2	82
86DP037S	700	200	N	20	N	100	N	<.1	<.02	<5	<2	<.1	<2	43
86DP038S	500	200	N	20	N	100	N	<.1	<.02	<5	<2	.2	<2	45
86DP039S	500	150	N	20	N	150	N	<.1	<.02	<5	<2	<.1	<2	40
86DP040S	500	200	N	30	N	150	N	<.1	<.02	<5	<2	.1	<2	59
86DP041S	300	200	N	30	N	150	N	<.1	<.02	<5	<2	<.1	<2	70
86DP042S	500	300	N	20	N	100	N	<.1	<.02	<5	3	<.1	<2	66
86DP044S	500	150	N	20	N	100	N	<.1	<.02	<5	<2	<.1	<2	55

Table 4. Results of analyses of heavy-mineral concentrate samples from the Disaster Peak Wilderness Study Area, Malheur County, Oregon, and Humboldt County, Nevada

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
86DP001H	42 3 4	118 8 47	10.0	5.00	10	>2.0	1,500	N	N	N	70	500
86DP002H	42 2 47	118 9 35	10.0	5.00	7	>2.0	2,000	N	N	N	70	500
86DP003H	42 2 55	118 9 40	15.0	5.00	7	>2.0	2,000	N	N	N	50	700
86DP004H	42 3 58	118 8 44	10.0	7.00	7	>2.0	5,000	N	N	N	50	500
86DP005H	42 3 58	118 10 13	7.0	2.00	7	>2.0	1,000	N	N	N	70	700
86DP006H	42 4 1	118 10 9	5.0	1.50	7	>2.0	1,000	N	N	N	50	700
86DP008H	42 1 51	118 10 17	7.0	5.00	15	>2.0	1,500	N	N	N	50	500
86DP009H	42 2 2	118 10 14	5.0	2.00	10	>2.0	500	N	N	N	50	700
86DP010H	42 0 25	118 9 20	10.0	3.00	7	>2.0	1,000	N	N	N	70	500
86DP011H	42 0 15	118 9 13	7.0	2.00	10	>2.0	2,000	N	N	N	70	500
86DP012H	41 59 8	118 9 52	7.0	5.00	10	>2.0	1,000	N	N	N	50	1,000
86DP013H	41 58 5	118 10 36	7.0	7.00	10	2.0	1,000	N	N	N	50	200
86DP014H	41 58 37	118 11 13	10.0	10.00	10	>2.0	1,500	N	N	N	70	100
86DP015H	42 59 0	118 11 31	10.0	10.00	10	>2.0	1,500	N	N	N	50	100
86DP016H	42 3 57	118 12 29	3.0	1.50	7	>2.0	700	N	N	N	100	700
86DP017H	42 0 1	118 8 58	10.0	7.00	15	>2.0	1,500	N	N	N	70	300
86DP018H	42 3 26	118 12 27	7.0	2.00	7	>2.0	1,000	N	N	N	50	500
86DP019H	41 56 20	118 11 10	.7	.30	10	>2.0	500	N	N	N	70	100
86DP020H	42 2 50	118 12 8	1.0	.30	7	1.5	200	N	N	N	50	700
86DP021H	41 56 4	118 11 10	1.0	2.00	15	>2.0	500	N	N	N	50	150
86DP023H	41 55 40	118 12 20	.5	.10	7	>2.0	500	N	N	N	70	300
86DP025H	41 57 5	118 13 30	1.0	.20	15	>2.0	700	N	N	N	70	200
86DP027H	41 56 52	118 13 13	1.0	.30	30	>2.0	200	N	N	N	50	50
86DP029H	41 56 34	118 14 18	.5	.07	10	>2.0	200	N	N	N	50	500
86DP031H	41 56 28	118 14 35	.3	.10	15	.7	150	N	N	N	50	500
86DP032H	41 57 0	118 17 45	.7	.20	7	.2	100	N	N	N	30	700
86DP033H	41 58 0	118 17 7	1.0	.50	15	.7	200	N	N	N	30	300
86DP034H	41 58 33	118 16 45	1.0	.20	15	2.0	500	N	N	N	70	300
86DP035H	41 58 43	118 16 20	.5	.20	10	1.0	150	N	N	N	50	300
86DP036H	41 58 30	118 15 20	1.0	1.00	10	.7	300	N	N	N	70	300
86DP037H	42 0 53	118 11 23	.7	.30	10	>2.0	200	N	N	N	30	300
86DP038H	42 0 58	118 11 22	.7	.20	10	.7	100	N	N	N	20	500
86DP039H	41 59 32	118 14 24	1.0	.20	10	>2.0	200	N	N	N	70	700
86DP040H	42 0 8	118 17 16	1.0	.20	10	>2.0	200	N	N	N	20	700
86DP041H	41 59 20	118 17 22	1.0	.20	7	.3	100	N	N	N	20	700
86DP042H	42 0 8	118 17 8	.7	.15	10	.2	100	N	N	N	20	500
86DP044H	42 0 7	118 15 53	1.0	.20	10	>2.0	200	N	N	N	20	500

Table 4. Results of analyses of heavy-mineral concentrate samples from the Disaster Peak Wilderness Study Area, Malheur County, Oregon, and Humboldt County,Nevada--Continued

Sample	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	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s
86DP001H	<2	N	N	50	700	200	1,000	N	50	100	20	N	100	200
86DP002H	<2	N	N	50	500	200	700	N	<50	70	20	N	100	500
86DP003H	<2	N	N	50	500	200	500	N	50	100	20	N	70	150
86DP004H	<2	N	N	50	200	7,000	1,000	10	70	100	50	N	100	20
86DP005H	<2	N	N	30	200	200	500	N	<50	50	20	N	20	<20
86DP006H	<2	N	N	10	50	100	200	N	50	30	70	N	<10	150
86DP008H	<2	50	N	30	300	200	1,000	N	<50	70	N	N	70	50
86DP009H	<2	N	N	15	200	100	300	N	<50	50	N	N	50	200
86DP010H	<2	N	N	50	300	500	500	N	<50	70	N	N	70	N
86DP011H	<2	N	N	30	200	300	1,000	N	<50	50	20	N	50	150
86DP012H	<2	N	N	50	300	300	100	N	N	100	N	N	70	N
86DP013H	<2	N	N	50	1,000	150	N	N	N	150	N	N	70	N
86DP014H	<2	N	N	70	500	500	N	N	N	150	N	N	150	N
86DP015H	<2	N	N	70	500	500	N	N	N	100	N	N	100	N
86DP016H	<2	N	N	<10	70	20	200	N	<50	20	N	N	<10	N
86DP017H	<2	N	N	70	1,000	200	100	N	N	100	N	N	100	100
86DP018H	<2	N	N	15	50	70	200	N	50	30	N	N	<10	<20
86DP019H	<2	N	N	N	30	15	500	N	N	20	N	N	50	N
86DP020H	<2	N	N	<10	30	15	<50	N	N	15	N	N	<10	N
86DP021H	<2	N	N	<10	150	20	300	N	N	20	N	N	<10	N
86DP023H	<2	N	N	<10	20	15	500	N	<50	15	N	N	<10	N
86DP025H	<2	N	N	<10	20	20	700	N	70	15	N	N	<10	<20
86DP027H	<2	N	N	<10	20	15	700	N	N	20	N	N	50	N
86DP029H	<2	N	N	<10	20	15	500	N	50	10	N	N	<10	N
86DP031H	<2	N	N	<10	20	<10	300	N	N	10	N	N	<10	N
86DP032H	<2	N	N	<10	20	15	N	N	N	10	N	N	<10	N
86DP033H	<2	N	N	<10	30	15	N	N	N	10	N	N	<10	N
86DP034H	<5	N	N	<20	50	30	200	N	N	20	N	N	<20	N
86DP035H	<2	N	N	<10	100	15	N	N	N	10	30	N	<10	100
86DP036H	<5	N	N	<20	150	20	N	N	N	20	N	N	<20	N
86DP037H	<2	N	N	N	30	<10	70	N	N	10	<20	N	<10	70
86DP038H	<2	N	N	N	<20	<10	N	N	N	<10	<20	N	<10	N
86DP039H	<2	N	N	N	20	<10	200	N	N	15	<20	N	<10	N
86DP040H	<2	N	N	N	20	<10	150	N	N	10	<20	N	<10	N
86DP041H	<2	N	N	N	20	<10	N	N	N	<10	<20	N	<10	N
86DP042H	<2	N	N	N	30	<10	N	N	N	<10	<20	N	<10	N
86DP044H	<2	N	N	N	<20	10	150	N	<50	10	<20	N	<10	<20

Table 4. Results of analyses of heavy-mineral concentrate samples from the Disaster Peak Wilderness Study Area, Malheur County, Oregon, and Humboldt County,Nevada--Continued

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Au-ppm aa	Hg-ppm aa	As-ppm aa	Bi-ppm aa	Cd-ppm aa	Sb-ppm aa	Zn-ppm aa
86DP001H	500	200	N	500	N	>2,000	N	--	--	--	--	--	--	--
86DP002H	500	200	N	300	N	>2,000	N	--	--	--	--	--	--	--
86DP003H	500	200	N	300	N	>2,000	N	--	--	--	--	--	--	--
86DP004H	500	200	N	500	N	>2,000	N	--	--	--	--	--	--	--
86DP005H	1,000	200	N	300	N	>2,000	N	--	--	--	--	--	--	--
86DP006H	1,000	150	N	300	N	>2,000	N	--	--	--	--	--	--	--
86DP008H	700	300	N	700	N	>2,000	N	--	--	--	--	--	--	--
86DP009H	1,000	200	N	300	N	>2,000	N	--	--	--	--	--	--	--
86DP010H	500	300	N	200	N	>2,000	N	--	--	--	--	--	--	--
86DP011H	700	300	N	700	N	>2,000	N	--	--	--	--	--	--	--
86DP012H	700	300	N	70	N	>2,000	N	--	--	--	--	--	--	--
86DP013H	500	300	N	30	N	1,500	N	--	--	--	--	--	--	--
86DP014H	500	500	N	50	N	1,500	N	--	--	--	--	--	--	--
86DP015H	500	500	N	30	N	700	N	--	--	--	--	--	--	--
86DP016H	2,000	150	N	200	N	>2,000	N	--	--	--	--	--	--	--
86DP017H	500	500	N	50	N	>2,000	N	--	--	--	--	--	--	--
86DP018H	1,000	150	N	100	N	>2,000	N	--	--	--	--	--	--	--
86DP019H	700	150	N	700	N	>2,000	N	--	--	--	--	--	--	--
86DP020H	2,000	100	N	50	N	>2,000	N	--	--	--	--	--	--	--
86DP021H	1,000	150	N	100	N	>2,000	N	--	--	--	--	--	--	--
86DP023H	1,000	200	N	200	N	>2,000	N	--	--	--	--	--	--	--
86DP025H	1,000	300	N	200	N	>2,000	N	--	--	--	--	--	--	--
86DP027H	500	200	N	500	N	>2,000	N	--	--	--	--	--	--	--
86DP029H	1,000	200	N	100	N	>2,000	N	--	--	--	--	--	--	--
86DP031H	1,000	50	N	100	N	>2,000	N	--	--	--	--	--	--	--
86DP032H	1,000	50	N	30	N	>2,000	N	--	--	--	--	--	--	--
86DP033H	1,000	70	N	70	N	>2,000	N	--	--	--	--	--	--	--
86DP034H	2,000	100	N	1,000	N	>5,000	N	--	--	--	--	--	--	--
86DP035H	1,500	70	N	70	N	>2,000	N	--	--	--	--	--	--	--
86DP036H	1,500	200	N	100	N	>5,000	N	--	--	--	--	--	--	--
86DP037H	1,000	50	<100	100	N	>2,000	N	--	--	--	--	--	--	--
86DP038H	1,500	30	<100	50	N	>2,000	N	--	--	--	--	--	--	--
86DP039H	2,000	100	<100	500	N	>2,000	N	--	--	--	--	--	--	--
86DP040H	2,000	100	<100	500	N	>2,000	N	--	--	--	--	--	--	--
86DP041H	2,000	50	<100	100	N	>2,000	N	--	--	--	--	--	--	--
86DP042H	2,000	30	<100	30	N	>2,000	N	--	--	--	--	--	--	--
86DP044H	2,000	150	<100	150	N	>2,000	N	--	--	--	--	--	--	--

Table 5. Results of analyses of rock samples from the Disaster Peak Wilderness Study Area, Malheur County, Oregon, and Humboldt County, Nevada

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
86DP001R	42 3 4	118 8 47	3.0	.20	.20	.50	700	.7	N	N	50	500
86DP007R	42 4 5	118 9 26	3.0	.10	.10	.20	1,000	N	N	N	50	50
86DP012R	41 59 8	118 9 52	2.0	.20	.05	.20	100	N	N	N	500	300
86DP013R	41 58 5	118 10 36	10.0	5.00	7.00	>1.00	1,000	N	N	N	10	200
86DP017R	42 0 1	118 8 58	5.0	.70	1.00	1.00	500	N	N	N	300	700
86DP019R	41 56 20	118 11 10	5.0	2.00	5.00	1.00	700	N	N	N	15	700
86DP020R	42 2 50	118 12 8	2.0	.07	.10	1.00	700	1.0	N	N	20	500
86DP025R	41 57 5	118 13 30	.3	.05	<.05	.02	150	N	N	N	30	100

Sample	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	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s
86DP001R	1.5	N	N	N	<10	7	70	<5	<20	5	50	N	7	N
86DP007R	3.0	N	N	N	<10	10	100	7	20	5	50	N	5	N
86DP012R	1.5	N	N	N	<10	7	70	N	20	5	30	N	7	N
86DP013R	<1.0	N	N	50	100	200	N	N	N	100	N	N	30	N
86DP017R	1.5	N	N	5	<10	20	100	N	20	5	30	N	15	N
86DP019R	<1.0	N	N	15	10	15	N	N	N	7	20	N	20	N
86DP020R	1.0	N	N	N	<10	10	30	<5	<20	7	20	N	10	N
86DP025R	N	N	N	N	<10	<5	N	N	N	7	N	N	N	N

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Au-ppm aa	Hg-ppm aa	As-ppm icp	Bi-ppm icp	Cd-ppm icp	Sb-ppm icp	Zn-ppm icp
86DP001R	<100	10	N	50	<200	300	N	<.1	<.02	<5	<2	<.1	<2	80
86DP007R	<100	15	N	100	<200	500	N	<.1	.02	<5	<2	<.1	<2	27
86DP012R	<100	30	N	70	<200	500	N	<.1	.46	71	<2	<.1	9	15
86DP013R	300	200	N	20	<200	100	N	<.1	<.02	<5	<2	.5	<2	68
86DP017R	200	100	N	70	<200	500	N	<.1	1.40	99	<2	<.1	8	41
86DP019R	1,000	150	N	10	<200	500	N	<.1	.02	<5	<2	<.1	<2	32
86DP020R	150	20	N	30	<200	200	N	<.1	.08	39	<2	<.1	<2	22
86DP025R	<100	20	<50	N	<200	N	N	<.1	.05	<5	<2	<.1	<2	4