

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Semiquantitative Spectrographic Analyses of Rocks
from the Mount Jordan Vicinity,
Custer County, Idaho

By

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Open-File Report 82-467
1982

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

DISCUSSION

One hundred and twenty-seven rock samples were collected from the Mount Jordan vicinity for semiquantitative spectrographic analysis to help define areas that might be favorable for additional exploration. This study was part of the Challis 1°x 2°, Idaho mapping project which is part of the Conterminous United States Mineral Resource Assessment Program (CUSMAP) of the U.S. Geological Survey. Brief descriptions of the geologic setting (Foster, 1981a,b) and a geologic map of the area (Foster, 1982) are available.

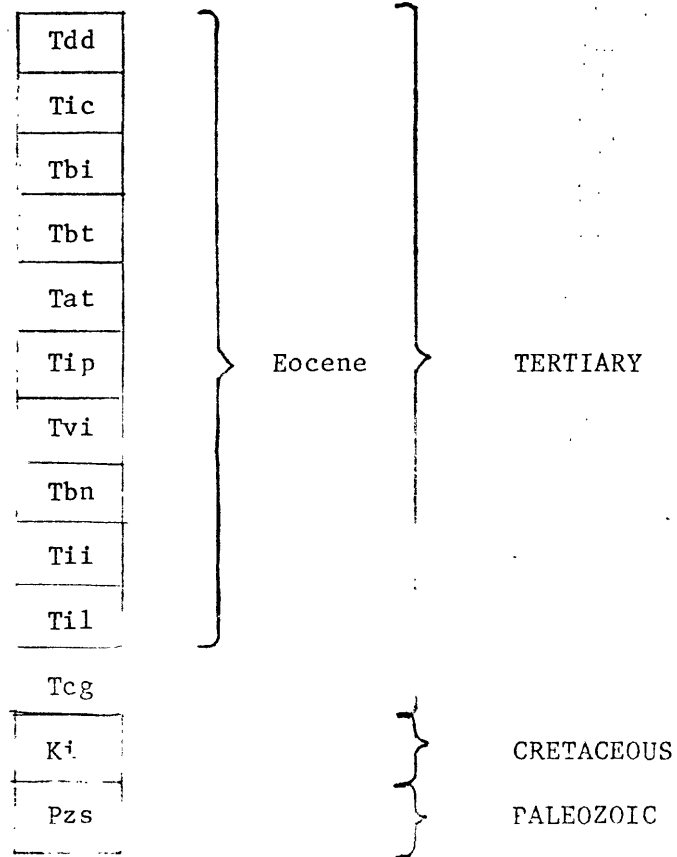
Only samples considered to be representative of a particular lithology and type of hydrothermal alteration were collected. Parts of outcrops affected by recognizable weathering processes were not sampled. The collection of uniform rock chip size was used to prevent sample-volume variation.

The rock samples were crushed to minus 6 mm in a jaw crusher, split, and then ground to minus 0.1 mm in a vertical pulverizer equipped with ceramic plates. Analyses were performed using six-step semiquantitative spectrographic direct-current arc emission spectrography. Values are reported as the approximate geometric midpoints (1.0, 1.5, 2.0, 3.0, 5.0, 7.0, and so forth) of geometric brackets having the boundaries 0.83, 1.2, 1.8, 2.6, 3.8, 5.6, 8.3, and so forth. Grimes and Marranzino (1968) provide a discussion of this technique. The precision of the emission spectrographic method is given by Motooka and Grimes (1976). Rock sample localities are shown on figure 1. Results of all analyses are shown in table 1.

REFERENCES CITED

- Foster, Fess, 1981a, Field relationships of Challis volcanics in the vicinity of Mt. Jordan, Custer County, Idaho: Northwest Geology, v. 10, p. 46-55.
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_____, 1982, Geologic map of Mt. Jordan and vicinity, Custer County, Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-1434, scale 1:24,000 (in press).
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.

CORRELATION OF GEOLOGIC UNITS



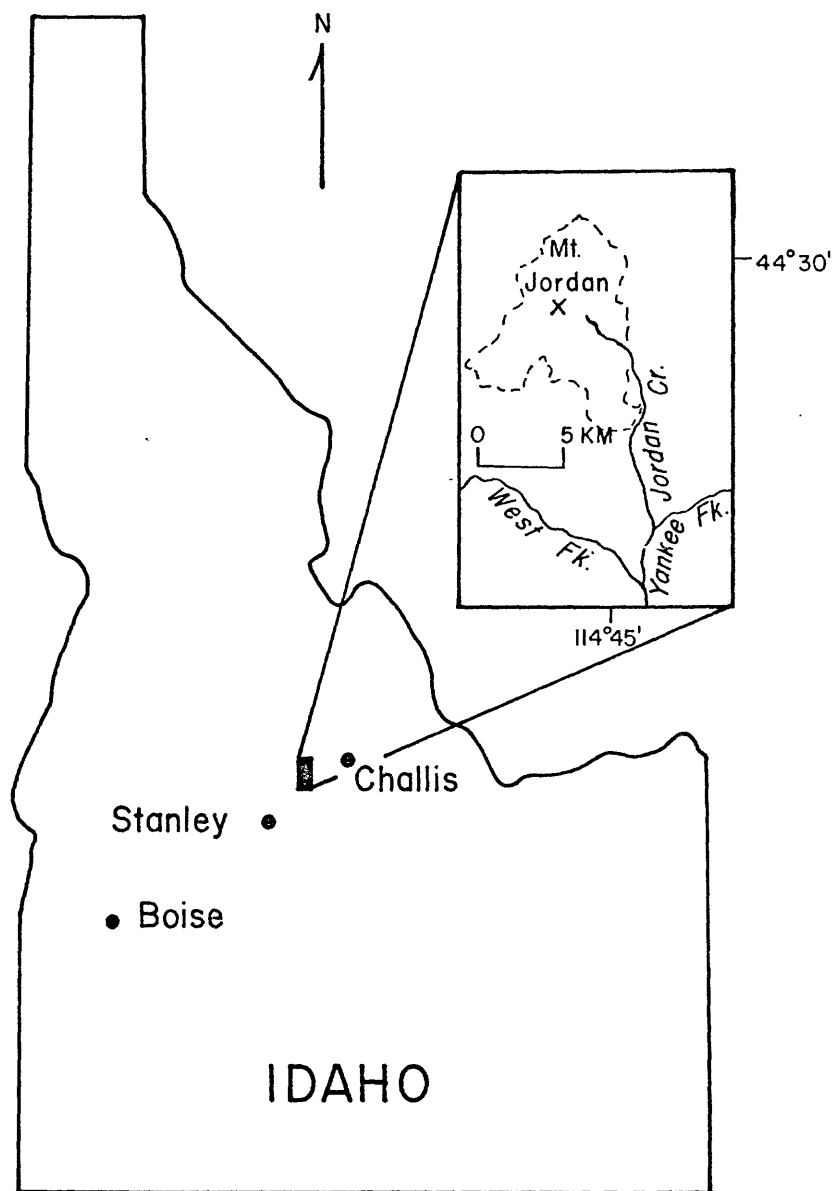
DESCRIPTION OF GEOLOGIC UNITS SHOWN IN TABLE 1

(Descriptions based on hand sample identification and outcrop appearance)

CHALLIS VOLCANICS (EOCENE)

- Tdd Dark dikes--Dark-gray, porphyritic intrusions of quartz latite(?) containing about 10 percent phenocrysts consisting of plagioclase (1-2 mm), alkali feldspar (1-2 mm), and unidentifiable ferromagnesian minerals (1-2 mm). Typically altered and occasionally vesicular
- Tic Intrusive complex--Ruddy-colored, weathering into prominent outcrops; discordant rhyolitic stock and associated dikelets. Contains 15 percent phenocrysts or less consisting of quartz (1-2 mm), sanidine (1-3 mm), and occasional altered ferromagnesian minerals (1 mm)
- Tbi Basaltic intrusive rocks--Dark-gray to black porphyritic intrusive rocks containing about 25 percent phenocrysts consisting of pyroxene (1 mm) and plagioclase (less than 1 mm) in a gray-black aphanitic matrix
- Tbt Bedded tuffaceous rocks--Light-gray to black, laminated, chiefly carbonaceous siltstones, tuffaceous epiclastic debris, air-fall tuff, and possible water-lain tuff. Minor nonwelded, crystal-poor ash-flow tuff occurs as small canyon filling deposits within the unit. Estimated thickness approximately 350 m
- Tat Ash-flow tuff--Simple cooling unit of light-gray, crystal- and pumice-rich, lithic-poor rhyodacitic welded ash-flow tuff. Contains green fiamme as much as 25 cm long and approximately 20 percent phenocrysts consisting of plagioclase (1-2 mm), alkali feldspar (1-2 mm), quartz (0.5-1 mm), biotite (0.5-1 mm), and hornblende (0.5-1 mm). Tuff contains sedimentary basement rock lithic fragments. Thickness ranges from 375 to 675 m
- Tip Intermediate porphyry--Dark-gray intrusive rock containing about 20 percent phenocrysts consisting of plagioclase (5-10 mm) and subordinate ferromagnesian minerals (1-2 mm) and quartz (1-2 mm). Accidental xenoliths of unit Pzs are common in the rock
- Tvi Vent intrusive mass--Dark-gray to black andesitic intrusive rock containing less than 10 percent phenocrysts of plagioclase (1-2 mm) and hornblende (1 mm) in an aphanitic groundmass. Abundant rounded xenoliths of juvenile, accidental, and accessory rock fragments 0.1 mm to 3 m in size make up to 50 percent of the rock near the margins of the intrusive mass
- Tbn Breccia neck--Dark-green to purple, extensively autobrecciated andesitic intrusive rock containing about 25 percent phenocrysts of plagioclase (0.5-1 mm), pyroxene (0.5-1 mm), and hornblende (0.5 mm)
- Tii Intermediate intrusive rock--Dark-green andesitic intrusive rock containing less than 10 percent phenocrysts of plagioclase (1-2 mm) and chloritized ferromagnesian minerals (0.5-1 mm). Border zones contain subangular xenoliths of unit Ti1

- Til Intermediate lavas--Purple, weathering into prominent outcrops; extensively autobrecciated, near-vent andesitic extrusive rocks. Map unit consists predominantly of nonvesicular lavas containing about 40 percent phenocrysts consisting of plagioclase (1-2 mm), pyroxene (1-2 mm), and hornblende (0.5-1 mm). Contains subordinate laharic debris and ash-flow and air-fall tuffs
- Tcg CONGLOMERATE (TERTIARY)--Boulder conglomerate locally overlying the unit Ki. The lower beds of the conglomerate contain well-rounded boulders and cobbles of units Ki and Pzs in clast-to-clast contact. Cobbles of unit Til gradually become dominant in the upper part of the conglomerate. Estimated thickness of conglomerate 30 m
- Ki IDAHO BATHOLITH (CRETACEOUS)--Massive, light-gray, medium-grained, equigranular biotite granite. Rock contains 35 percent quartz, 30 percent plagioclase, 25 percent alkali feldspar, and 10 percent biotite
- Pzs SEDIMENTARY ROCKS UNDIVIDED (PALEOZOIC)--Thinly bedded sedimentary rocks occurring as hornfelsed roof pendants in the unit Ki. Contains interbedded calc-silicate rocks, quartzite, and graphitic and pelitic schists



Index showing location of study area

[Fe, Mg, Ca, and Ti reported in percent; all other elements reported in ppm (parts per million). Number in parentheses indicates lower limit of determination for element; L, present but less than determination limit; --, not detected. Analyst: E. F. Cooley]

Sample No.	Unit	Elements																											
		Fe (0.05)	Mg (0.02)	Ca (0.05)	Ti (0.002)	Mn (0.5)	Ag (2000)	As (10)	Ba (20)	Be (1)	Bt (10)	Cd (20)	Co (5)	Cr (10)	Cu (5)	La (20)	Mo (5)	Nb (20)	Ni (5)	Pb (10)	Sb (100)	Sc (5)	Sn (10)	Sr (100)	V (10)	V (50)	Y (10)	Zn (200)	Zr (10)
4	Tbl	5	2	3	1	1,000	--	--	10	1,000	2	--	20	100	50	100	5	20	10	50	--	20	--	700	150	--	50	--	200
6a	Tlc	2	0.1	0.5	0.15	200	--	--	10	50	10	--	--	--	5	500	7	100	5	70	--	L	--	--	--	--	100	L	700
6b	Tlc	1.5	0.07	0.2	0.15	200	--	--	10	20	5	--	--	--	L	150	5	70	L	70	--	L	--	--	--	--	50	--	500
7	Ttl	5	1	0.5	1	700	--	--	15	500	2	--	15	--	10	70	L	50	L	50	--	20	--	200	150	--	50	L	200
8	Tlc	2	0.1	0.1	.15	200	--	--	10	150	5	--	--	--	L	200	L	50	L	50	--	--	--	L	L	--	70	--	300
9	Ttl	5	3	5	0.7	1,500	--	--	15	1,000	2	--	20	150	50	100	5	20	15	70	--	20	--	L	200	--	50	--	200
12	Ttl	2	0.5	0.2	0.2	700	L	--	10	1,000	5	--	--	--	5	200	L	100	L	100	--	5	15	200	L	--	70	--	700
13	Ttl	2	1	0.2	0.5	500	--	--	10	700	5	--	10	70	100	L	L	10	50	--	15	--	200	150	--	20	--	200	
15	Tdd	5	2	2	1	1,000	--	--	20	1,000	2	--	30	L	70	100	L	20	10	50	--	20	--	500	200	--	50	--	300
16	Tlc	3	0.05	0.05	0.1	300	--	--	20	200	5	--	--	--	5	100	L	100	L	70	--	--	--	L	L	--	70	L	500
17	Tlc	2	0.05	0.2	0.15	200	--	--	30	150	5	--	--	--	L	100	20	100	L	70	--	L	--	--	L	--	70	--	700
19	Tlc	5	0.5	0.3	0.7	300	--	--	10	1,000	2	--	10	--	10	100	5	20	L	50	--	15	--	200	100	--	30	--	200
20	Ttl	7	2	5	1	2,000	--	--	20	1,000	2	--	30	50	50	100	10	20	10	70	--	20	--	1,000	200	--	50	--	300
21	Tlc	2	0.07	0.2	0.15	200	--	--	10	20	3	--	--	--	L	100	--	100	L	70	--	L	--	--	L	--	50	--	500
22	Kl	3	1	2	0.7	1,000	--	--	20	1,000	2	--	10	50	L	100	--	30	5	50	--	10	--	1,000	150	--	20	--	200
23	Ttl	3	0.5	2	0.5	1,000	--	--	15	3,000	3	--	10	50	7	150	--	20	5	70	--	10	--	700	70	--	20	--	200
26	Tlc	1	0.1	L	0.15	200	0.7	--	10	5,000	3	--	--	--	L	50	15	70	L	20	--	5	--	--	L	--	50	--	500
27	Tat	1	0.2	0.2	0.2	150	--	--	10	700	5	--	--	--	5	50	--	L	5	15	--	L	--	200	50	--	10	--	150
28	Ttl	3	0.2	5	0.2	1,000	--	--	10	1,500	3	--	L	--	7	100	5	L	L	20	--	10	--	300	50	--	30	--	300
29	Tlc	2	0.1	0.2	0.15	150	--	--	10	300	3	--	--	--	5	50	10	70	L	70	--	L	--	L	20	--	50	--	300
30b	Tbt	7	2	5	0.7	1,500	--	--	15	1,000	1	--	30	150	50	100	5	20	20	50	--	20	--	700	200	--	30	--	200
32	Tlc	2	0.15	0.2	0.15	150	--	--	15	100	3	--	--	--	5	50	15	70	L	50	--	L	--	--	L	--	50	--	500

Table 1.--Semi-quantitative spectrographic analytical results of rock samples, Mt. Jordan and vicinity, Idaho--Continued

Sample No.	Fe limit (0.05)	Elements																						
		Ca	Mg	Al	Si	Fe	Co	Ni	Cu	Zn	Pb	Bi	Be	Ba	Li	Na	K	Ag	As	Au	B	Br	Cd	Co
		(0.02)	(0.05)	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
35	Tic	1.5	0.02	0.05	0.1	300	--	--	10	200	2	--	--	10	200	2	--	--	--	--	--	--	--	--
37a	Tic	1	1	0.05	0.1	200	--	--	10	100	2	--	--	10	100	2	--	--	--	--	--	--	--	--
38a	Tic	3	0.2	0.2	0.2	700	--	--	10	700	2	--	--	10	700	2	--	--	--	--	--	--	--	--
38b	Tic	1	0.15	0.1	0.05	100	--	--	15	200	5	--	--	15	200	5	--	--	--	--	--	--	--	--
38c	Tic	1.5	0.02	0.1	0.1	200	--	--	10	200	3	--	--	10	200	3	--	--	--	--	--	--	--	--
38d	Tic	3	0.3	0.3	0.2	300	--	--	10	2,000	2	--	--	10	2,000	2	--	--	--	--	--	--	--	--
39	Tic	5	0.3	0.05	0.2	700	L	--	10	1,000	2	--	--	10	1,000	2	--	--	--	--	--	--	--	--
40	Tic	1.5	0.02	0.05	0.15	100	2	--	10	300	2	--	--	10	300	2	--	--	--	--	--	--	--	--
41	Tic	1	0.02	0.05	0.1	200	--	--	10	100	2	--	--	10	100	2	--	--	--	--	--	--	--	--
42	Pz	0.7	1	5	0.15	700	--	--	10	700	1.5	--	--	10	700	1.5	--	--	--	--	--	--	--	--
43	Tic	1	0.1	0.07	0.1	150	--	--	10	300	2	--	--	10	300	2	--	--	--	--	--	--	--	--
47	Tic	3	1	5	0.7	1,000	--	--	20	1,500	2	--	--	20	1,500	2	--	--	--	--	--	--	--	--
49a	Tic	1	0.1	20	0.07	200	--	--	10	300	5	--	--	10	300	5	--	--	--	--	--	--	--	--
49b	Tic	5	0.15	0.5	0.3	500	--	--	10	2,000	2	--	--	10	2,000	2	--	--	--	--	--	--	--	--
50a	Pz	0.7	1	20	0.05	1,500	--	--	10	100	1.5	--	--	10	100	1.5	--	--	--	--	--	--	--	--
50b	Tic	5	0.7	1	0.5	1,500	--	--	10	1,500	2	--	--	10	1,500	2	--	--	--	--	--	--	--	--
51a	K1	2	1	2	0.5	1,000	--	--	10	1,000	2	--	--	10	1,000	2	--	--	--	--	--	--	--	--
51b	K1	7	0.7	0.3	0.5	1,000	--	--	50	500	3	10	--	50	500	3	10	--	5,000	--	--	--	--	--
52a	Tic	1.5	0.02	0.3	0.1	300	--	--	10	700	2	--	--	10	700	2	--	--	--	--	--	--	--	--
52b	Tic	5	0.5	5	0.7	1,500	--	--	10	700	2	--	--	10	700	2	--	--	--	--	--	--	--	--
53	Tic	1.5	0.7	1	0.2	100	0.5	--	10	700	2	--	--	10	700	2	--	--	--	--	--	--	--	--
56	K1	15	1	1	0.2	5,000	--	--	50	200	5	--	--	50	200	5	--	--	--	--	--	--	--	--

Table 1.—Semi-quantitative spectrographic analytical results of rock samples, Mt. Jordan and vicinity, Idaho—Continued

Sample No.	Unit	Elements																													
		Pa (0.05)	W (0.05)	Ca (0.05)	Ti (0.002)	Mn (10)	Ag (0.5)	As (200)	Au (10)	B (10)	Be (20)	Be (1)	Bi (10)	Cd (20)	Co (5)	Cr (10)	Cu (5)	La (20)	Mo (5)	Nb (20)	Ni (5)	Pb (10)	Sb (100)	Se (5)	Sn (10)	Fe (100)	V (10)	N (50)	Y (10)	Zn (200)	Zr (10)
85	Tic	3	0.5	1	0.5	700	--	--	--	10	1,500	2	--	--	10	30	5	150	--	20	--	70	--	10	--	700	70	--	30	--	300
86	Ti1	10	2	5	0.7	2,000	--	--	--	20	2,000	1	--	--	30	100	50	150	5	20	L	50	--	30	--	1,000	200	--	50	--	500
87	Tic	2	0.05	0.1	0.15	150	--	--	--	10	200	3	--	--	--	--	L	70	5	70	--	50	--	5	--	--	L	--	50	--	500
89	Tic	2	0.1	0.2	0.1	150	1	--	--	10	150	3	--	--	--	--	15	50	5	100	--	100	--	5	--	--	L	--	150	--	500
91	Tic	2	0.3	0.2	0.2	500	--	--	--	10	1,000	5	--	--	20	7	150	5	L	--	70	--	10	--	100	20	--	30	--	200	
92	Tic	3	0.2	2	0.2	700	--	--	--	10	500	5	--	--	--	--	L	200	--	50	--	70	--	5	--	200	20	--	50	--	500
96	Ti1	5	2	5	1	1,000	--	--	--	20	1,000	1.5	--	--	30	200	50	100	5	L	50	70	--	30	--	1,000	200	--	30	--	200
97	Tic	2	0.2	0.2	0.15	500	--	--	--	10	200	5	--	--	--	--	10	150	L	30	--	70	--	10	--	--	L	--	50	--	300
98	Tic	2	0.1	0.5	0.15	700	--	--	--	10	700	5	--	--	--	--	5	200	--	50	--	70	--	L	--	--	L	--	70	L	300
100	Tic	2	0.1	0.05	0.15	150	--	--	--	10	700	3	--	--	--	--	10	50	20	70	--	70	--	L	--	--	L	--	70	--	500
101	Tic	2	0.2	0.05	0.15	150	--	--	--	10	500	3	--	--	--	--	7	50	30	70	--	50	--	L	--	--	L	--	70	--	500
102a	Ti1	5	2	7	0.7	1,000	--	--	--	10	1,500	2	--	--	20	30	20	150	--	L	10	100	--	20	--	700	150	--	50	--	200
102b	Ti1	5	2	2	0.7	1,000	--	--	--	20	1,500	2	--	--	20	70	20	150	--	L	15	100	--	20	--	700	200	--	50	--	200
103	Tic	1.5	0.2	0.05	0.1	150	1	--	--	20	150	1	--	--	--	20	10	50	50	L	5	20	--	L	--	--	1,000	--	10	--	50
103a	Tic	2	0.15	0.1	0.2	1,000	--	--	--	10	100	3	--	--	--	--	L	150	--	70	5	70	--	5	--	L	--	--	70	--	500
103b	Tic	1.5	0.02	0.2	0.07	500	--	--	--	10	100	2	--	--	--	--	L	70	L	50	--	50	--	L	--	--	--	--	50	--	200
103c	Tic	2	0.1	0.7	0.15	700	--	--	--	20	50	5	--	--	--	--	L	150	L	70	--	100	--	L	--	--	--	--	100	--	500
103d	Tic	2	0.1	0.3	0.15	500	--	--	--	10	50	5	--	--	--	--	L	300	L	50	--	70	--	L	--	--	--	--	100	--	300
103e	Tic	2	0.1	0.7	0.2	500	--	--	--	10	50	5	--	--	--	--	L	200	L	50	--	70	--	L	--	--	--	--	100	--	500
104a	Tic	3	0.1	0.7	0.2	500	--	--	--	10	30	5	--	--	--	--	20	200	L	50	--	70	--	L	--	--	--	--	100	--	500
104b	Tic	2	0.1	0.2	0.15	300	--	--	--	10	20	3	--	--	--	--	L	150	--	70	--	70	--	L	--	L	--	--	100	--	500
105	Tic	1	0.05	0.2	0.1	150	--	--	--	20	200	2	--	--	--	--	L	200	10	50	--	50	--	--	--	L	--	--	50	--	300
106	Tic	1	0.05	0.15	0.15	100	--	--	--	20	300	3	--	--	--	--	10	100	100	50	--	150	--	--	--	--	--	--	70	--	300

Table 1.--Semi-quantitative spectrographic analytical results of rock samples, Mt. Jordan and vicinity, Idaho--Continued

Sample No.	Unit	Elements																												
		Fe (0.05)	Ni (0.02)	Ca (0.05)	Ti (0.002)	Mn (10)	Ag (0.5)	Au (10)	R (20)	Ba (20)	Be (1)	Bi (10)	Cd (20)	Co (5)	Cu (5)	La (20)	Mo (5)	Nb (20)	Kr (5)	Pb (10)	Sb (100)	Sc (5)	Sn (10)	Sr (100)	V (10)	W (50)	Y (10)	Zn (200)	Zr (10)	
107	Tic	2	0.1	0.05	0.2	200	--	--	30	150	5	--	--	--	10	70	50	100	--	50	--	--	--	--	--	--	70	--	300	
108	Til	10	2	7	0.7	1,000	--	--	20	1,500	1	--	50	150	15	150	L	20	10	50	--	50	--	1,000	200	--	50	--	300	
109	Tic	3	0.5	0.7	0.2	700	1	--	--	10	1,000	1	--	L	--	15	150	--	70	--	200	--	5	--	200	20	--	100	200	500
109	Tic	7	2	10	1	1,500	--	--	20	1,500	1	--	30	100	10	100	--	20	L	50	--	50	--	1,000	300	--	50	--	300	
109	Tic	3	0.3	0.1	0.3	70	--	--	10	1,500	2	--	L	--	L	150	--	70	--	50	--	15	--	200	10	--	70	--	700	
110	Tic	2	0.15	0.2	0.15	500	2	--	--	10	300	3	--	--	100	200	L	70	--	200	--	--	--	--	L	--	70	L	700	
110	Tic	3	0.2	0.15	0.2	700	--	--	20	300	3	--	--	--	10	200	L	100	--	50	--	L	--	--	L	--	100	L	700	
110	Tic	3	0.2	0.1	0.15	700	--	--	--	20	100	5	--	--	5	200	10	100	--	50	--	5	--	--	L	--	100	200	700	
110	Tic	3	0.2	0.2	0.2	300	--	--	--	20	150	5	--	L	--	L	200	10	100	--	30	--	5	--	--	L	--	100	L	700
110	Tic	3	0.2	0.5	0.15	700	--	--	--	20	150	5	--	--	L	200	L	100	--	50	--	5	--	--	L	--	100	L	700	
110	Til	7	2	5	1	1,000	--	--	--	20	1,000	2	--	30	150	50	100	5	20	10	70	--	1,000	200	--	50	--	300		
110	Pss	2	1.5	7	0.2	1,000	--	--	--	20	1,000	2	--	5	70	L	50	--	L	15	20	--	15	--	200	150	--	50	--	300
110	Kl	3	1.5	2	0.7	1,000	--	--	--	15	1,000	2	--	5	30	L	150	--	30	--	50	--	15	--	2,000	100	--	20	--	200
110	Tic	2	0.1	0.05	0.1	500	--	--	--	20	700	3	--	--	200	150	L	100	L	100	--	L	--	100	L	--	70	200	500	
110	Tic	2	0.15	0.15	0.15	500	--	--	--	20	200	3	--	--	L	200	--	100	--	50	--	L	--	--	L	--	100	--	700	
110	Til	10	0.2	10	0.7	2,000	--	--	15	1,500	--	--	20	200	70	100	5	L	10	70	--	50	--	2,000	300	--	50	--	200	
110	Tic	3	0.15	0.1	0.15	300	--	--	--	20	500	2	--	--	5	200	--	100	--	70	--	L	--	L	--	--	20	--	700	
110	Tat	3	0.5	0.7	0.3	700	--	--	15	1,500	2	--	5	20	5	100	--	L	L	70	--	10	--	500	50	--	70	--	300	
111	Tid	10	0.5	0.5	0.7	1,000	--	--	--	20	1,500	3	--	10	--	10	100	10	50	--	70	--	20	--	500	L	--	50	--	500
111	Tic	2	0.3	0.5	0.1	500	--	--	--	20	1,000	3	--	--	--	20	150	L	100	--	100	--	--	--	200	L	--	70	500	500
112	Til	7	2	7	1	1,500	--	--	--	20	1,000	3	--	20	100	20	150	5	50	10	100	--	30	--	700	200	--	100	--	300
112	Tic	7	0.2	0.15	0.15	200	20	--	--	20	1,000	2	--	L	L	1,500	150	10	100	--	10,000	--	L	--	200	20	--	100	300	300
112	Tic	3	0.2	0.15	0.15	1,000	50	--	--	20	700	3	--	20	10	--	20,000	150	30	70	--	20,000	--	200	20	--	100	5,000	300	

Table 1.--Semi-quantitative spectrographic analytical results of rock samples, Mt. Jordan and vicinity, Idaho--(Continued)

Sample No.	Unit	Elements																													
		Fe (0.05)	Mg (0.02)	Ca (0.05)	Ti (0.002)	Mn (10)	Ag (0.5)	Au (10)	B (10)	Ba (20)	Be (1)	Bi (10)	Cd (20)	Co (5)	Cr (10)	Cu (5)	La (20)	Mo (5)	Nb (20)	Ni (5)	Pb (10)	Sb (100)	Se (5)	Sn (10)	Sr (100)	V (10)	W (50)	Y (10)	Zn (200)	Zr (10)	
113	Tat	3	0.5	3	0.3	1,000	--	--	--	20	3,000	3	--	L	--	30	150	--	50	--	100	--	10	--	500	20	--	70	--	500	
114	Tat	5	0.5	5	0.3	700	--	--	--	20	1,000	3	--	L	L	5	150	--	50	--	70	--	10	--	700	20	--	70	--	500	
115a	Tic	2	0.05	0.2	0.15	700	--	--	--	15	300	2	--	--	--	20	200	--	70	--	200	--	L	--	L	L	--	70	--	700	
115b	Tat	7	1.5	0.7	1	1,000	--	--	--	20	1,500	3	--	20	150	L	150	10	20	20	50	--	30	--	500	200	--	70	--	200	
115c	Tic	1.5	0.02	L	0.5	150	--	--	--	10	20	2	--	L	--	L	150	--	50	--	50	--	--	--	--	L	--	70	--	200	
115d	Tic	3	0.1	0.1	0.15	500	--	--	--	10	150	3	--	--	10	7	150	--	70	--	100	--	--	--	L	--	--	100	--	500	
116	Tic	5	2	5	0.7	1,000	--	--	--	20	1,000	1	--	30	150	20	100	L	20	20	70	--	50	--	1,500	200	--	50	--	300	
117	Tic	1.5	0.2	5	0.15	200	--	--	--	10	700	3	--	L	--	5	500	--	50	--	50	--	L	--	100	20	--	70	--	500	
118	Tic	2	0.5	G20	0.2	500	--	--	--	L	100	2	--	10	50	5	70	--	L	L	L	10	--	20	--	1,000	150	--	50	--	100
120a	Tic	5	0.5	0.1	0.5	1,500	0.5	--	--	20	1,500	2	--	5	--	150	100	--	50	--	300	--	20	--	300	20	--	70	--	500	
120b	Tic	5	0.5	0.5	0.7	1,500	--	--	--	20	1,500	3	--	10	--	15	100	--	30	--	70	--	20	--	500	50	--	70	--	500	
120c	Tic	5	0.7	0.7	0.7	2,000	--	--	--	20	1,500	3	--	10	--	15	200	L	20	--	100	--	20	--	500	50	--	70	--	500	
121	Tic	0.7	0.02	0.05	0.05	100	--	--	--	10	500	3	--	L	--	L	30	10	70	--	50	--	--	--	--	L	--	50	--	100	