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RECONNAISSANCE GEOCHEMICAL SAMPLING IN THE MELOZITNA QUADRANGLE, ALASKA

By

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Introduction

The samples described in this report were collected in conjunction with geologic field mapping in the Melozitna quadrangle. Geologic mapping was the primary objective, and consequently time and logistic support were not available to systematically sample the entire quadrangle. One hundred and twelve composite grab samples were collected at geologic field stations--108 from rock outcrops or in-situ rubble and four from sediment in active stream channels--by W. W. Patton, Jr., and T. P. Miller in 1968 and by R. M. Chapman and Patton in 1974. The sample sites are shown on the base map (fig. 1), and the reader is referred to the geologic map (Patton and others, 1978) to relate the samples to the areal geology.

Each sample was analyzed by the standard semiquantitative spectrographic method, and some of the samples were tested for gold by the atomic absorption method and for mercury by the mercury-vapor detector method (Ward and others, 1969). Background and anomalous values have been empirically selected by comparisons with values given in several published tables of element-abundance for various rock types and in a number of reports on other Alaskan geochemical investigations.

The relatively small number of samples, which were collected largely in the southern half of the quadrangle, do not warrant extensive geochemical interpretations. However, the analytical data will provide some guidance for future geochemical exploration in this area and for comparisons with geochemical data from similar terranes. Undue economic significance should not be attached to specific anomalous values without confirming them by additional sampling in the area or rock unit of interest.

Mineral deposits

A few placer gold deposits are known in the Melozitna quadrangle. The only significantly large production was from Utopia Creek (north edge of map), which drains an area of andesitic volcanic rocks that are cut by felsic rocks. A minor amount of placer gold was recovered from Florence Bar in the Koyukuk River during the very early mining days. Placer gold was mined on a small scale at various times between 1909 and 1955 from Golden, Illinois, and Mason Creeks in the southeastern part of the quadrangle, and reportedly some cassiterite was recovered with the gold on Mason Creek (Cobb, 1975, p. 23-26). An unknown, but probably small, amount of prospecting for gold has been done in the Gold Mountain-Illinois Creek area since 1900. Small occurrences or anomalous amounts of lead, silver, zinc, copper, barite, and possibly molybdenum in bedrock or rubble are known in the Utopia Creek and Sun Mountain areas where the geologic settings are favorable for mineral deposits (Miller and Ferrians, 1968, p. 3-6; Cobb, 1973, p. 144-145). Chalcopyrite and malachite occur in a fine-grained granitic dike within volcanic hornfels just south of Hochandochtla Mountain (T. P. Miller, 1978, written commun.). There was no known active mining in this quadrangle in 1974.

Geochemical results

Semiquantitative spectrographic and mercury-vapor detector analyses of 94 rock and four stream sediment samples, collected in 1974, are given in table 1. Semiquantitative spectrographic analyses of 14 rock samples, collected

in 1968, are shown in table 2; these samples, designated A through N, are the same, and listed in the same order, as those for which rapid rock chemical analyses are given on the geologic map of the Melozitna quadrangle (Patton and others, 1978, table 1). The interpreted ranges of background and anomalous amounts for 31 elements are listed in table 3. Anomalous values given for a few of the elements, particularly Cr, Cu and Ni, may include amounts that reflect relatively high backgrounds for certain rock types and therefore may not be significantly anomalous from a mineral resource standpoint. Elements that were looked for and not found (with certain exceptions) at their lower limit of detection in the spectrographic analyses are given in table 4. In table 5 the samples that contain anomalous amounts of one or more elements are grouped according to the map units which are used on the geologic map (Patton and others, 1978).

Elements of economic interest

A majority of the anomalous occurrences of economically significant metallic elements, particularly Sn, Pb, Zn, and Hg, are closely associated with the quartz monzonite pluton in the Kokrines Hills. They are in the gneissic, hornfelsic, and schistose rocks of the gneiss and quartzite, pelitic schist, and quartzite units near their contacts with the pluton, in or near granitic dikes that intrude these units, and in the quartz monzonite. Cr, Ni, and some Cu anomalies are associated with the basalt and diabase and ultramafic rocks units and may not be indicative of significant metallic enrichment. Overall the anomalous values are not exceptionally high, and no anomalous amounts of Au, Bi, Sb, and W are present.

Geological and geochemical data related to the occurrences of selected metallic elements are summarized in the following discussion.

Ag -- The only anomalous amount, 3 ppm, was found in sample 69. This sample also is the only one that shows a Mo anomaly, and is one of three that has an anomalous V content. The rock is quartz-mica schist that is closely associated in the marble unit (Pz m) with dolomitic limestone, limy schist, graphitic schist, and basaltic greenstone, and is in contact with quartz monzonite.

Au -- None of the samples showed Au at or above the lower limits of the spectrographic method (7 or 10 ppm, table 4). The 98 samples in table 1 were also analyzed by the atomic absorption method. Au was not found at or above the lower limit of 0.05 ppm, but in samples 1, 3, 36, and 40 some Au was detected below this limit.

Bi -- None of the samples showed Bi at or above the 5 ppm lower limit of detection.

Cr -- Anomalous amounts, 700-1,000 ppm, together with anomalous Ni values are present in sample 17 from a hornblende anorthosite in the ultramafic rocks unit, sample 25 of hornfelsic basalt in the pelitic schist unit, and sample 30 of an ultramafic rock (unit JPu). These amounts probably reflect the characteristic abundance of Cr and Ni in ultramafic and some mafic rocks, and therefore have doubtful economic significance.

Cu -- Anomalous amounts are found in six samples. Three of these (12, 15, and 16) that show 500 ppm are from mafic rocks in the basalt and diabase, and ultramafic rocks units, and a fourth, sample 19, also containing 500 ppm, is a stream sediment derived chiefly from the mafic rock terrane of the basalt and diabase unit. These values probably reflect a slight concentration of Cu in the mafic rocks. Sample 58, containing 150 ppm Cu, is from sheared and altered pelitic and greenstone schists (part of the pelitic schist unit) that are intruded by quartz-tourmaline veins (sample 57); anomalous amounts of B, Sn, and Ga are associated. Sample 94, from quartz-mica schist of the pelitic schist unit with some white quartz veins but no visible metallization, contains 200 ppm Cu as well as anomalous amounts of Ba and Zn.

Hg -- Analyses were run on 88 of the samples in table 1. Five of these contain Hg >0.1 ppm, the arbitrarily selected threshold value. Sample 12 from a basalt or tuff in the basalt and diabase unit has the largest amount, 2 ppm, as well as 500 ppm Cu. An unaltered conglomerate and grit in the volcanic graywacke and mudstone unit, sample 71, shows 0.45 ppm, and sample 2, a hornfelsic siltstone also from this unit and close to a contact with granitic rock, contains 0.2 ppm; neither of these samples show anomalous quantities of other elements. Sample 37 from a gneissic schist of the gneiss and quartzite unit, close to a contact with granitic rock, has 0.12 ppm Hg together with 200 ppm Zn. Sample 85 has 0.14 ppm Hg from sediment in a stream that drains the contact zone between granitic rocks of the quartz monzonite unit and schists of the pelitic schist unit.

Mo -- The only anomalous amount is present in sample 69, described above, together with Ag and V.

Ni -- Four anomalous values, 500-1,000 ppm, are found in samples 6, 17, 25, and 30 from mafic or ultramafic rocks, and the last three of these also have associated high Cr values. These Ni values probably reflect the characteristically high Ni content of mafic and ultramafic rocks, and may not be economically significant.

Pb -- Relatively low anomalous amounts are found in only five samples, all of which are from, or closely associated with, granitic rocks. The largest amount, 200 ppm, is in sample 23, a hornfelsic, pyritic greenstone in the basalt and diabase unit close to a contact with a granitic intrusive. Sample 21 from a granitic rock and gneiss contact zone in the gneiss and quartzite unit shows 100 ppm Pb and weakly anomalous amounts of Sn, Li, and Ga. Sample 56 from a granitic rock in gneiss within the gneiss and quartzite unit contains 70 ppm Pb as well as slightly anomalous amounts of Be, Ce, and Li. Sample 24, granitic gneiss also from the gneiss and quartzite unit, contains 70 ppm Pb associated with anomalous amounts of Ga and Sn. Sample 73 of granitic rock from the quartz monzonite unit has 70 ppm Pb, plus anomalous amounts of Be, Li, Sn, Y, and Yb.

Sb -- None of the 98 samples listed in table 1 showed Sb at or above 20 ppm, and at a 70 ppm detection limit Sb was not found in the 14 samples listed in table 2. Some anomalous amounts of Sb might be concealed by these relatively high detection limits, but no Sb minerals were noted.

Sn -- All amounts of Sn above the detection limit of 2 ppm are interpreted as anomalous, and 13 of the 98 samples listed in table 1 are weakly to moderately anomalous, 3 to 20 ppm. The detection limit for the 14 samples in table 2 was 15 ppm, and possibly some anomalous amounts in this group of samples may be concealed. The anomalous amounts of Sn are in quartz monzonite and granitic rocks of the quartz monzonite unit, in related quartz-tourmaline veins, and in schistose, hornfelsic, and gneissic rocks close to their contacts with the quartz monzonite unit rocks. The Sn is commonly associated with anomalous amounts of B, Be, Li, and rare earth elements.

W -- At a detection limit of 10 ppm, W was not found in any of the samples.

Zn -- Seven samples contain 200 ppm, which is not exceptionally high but may be anomalous in this area. Samples 1, 8, 37, and 40 are from hornfelsic rocks closely associated with igneous rocks of the andesitic volcanic rocks and quartz monzonite units. Samples 91 and 92 are from schist and basaltic greenstone which are cut by iron-stained quartz veins. Sample 94, collected in the headwater drainage of Illinois Creek, is from a quartz-mica schist that, although showing no visible metallization, also contains anomalous amounts of Ba and Cu.

Other elements

Some of the elements that are not primarily of economic interest in interior Alaska may be potentially useful as pathfinder elements or significant as indicator members of characteristic geochemical suites that are associated with particular rock units or types of mineral deposits.

Arsenic is commonly a pathfinder element for gold or complex sulfide metalliferous deposits (Levinson, 1974). Although it was not detected in the 112 samples discussed in this report, the lower detection limits of 100 and 70 ppm (table 4) are relatively high and might conceal some significant amounts of arsenic.

Most of the anomalous amounts of B, Be, and Li are in samples from the granitic rocks, the genetically associated quartz-tourmaline and pegmatitic veins, and the country rock close to granitic rocks. It is noteworthy that many of the anomalous amounts of Sn are associated in these same samples. B and Be have been recognized as either pathfinder or indicator elements in the search for Sn-W vein and greisen deposits and for metalliferous skarn deposits (Levinson, 1974). Li may also prove to be significant as an associated indicator element in this terrane.

Anomalous amounts of the rare-earth elements Ce, Er, La, Nd, Pr, and Yb occur in the granitic rocks and in the gneissic and hornfelsic rocks at or near contacts with the granitic rocks. These elements seem to be particularly characteristic of the quartz monzonite and granitic rocks (unit Km, table 5), and additional sampling studies might establish their value as pathfinder or indicator elements.

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Table 1.--*Semiquantitative spectrographic and mercury-vapor detector analyses of 94 rock and four stream sediment samples*

[Analysts: Chris Heropoulos, semiquantitative spectrograph; C. A. Curtis and J. D. Hoffman, mercury-vapor detector. Analytical values are reported in the series 0.1, 0.15, 0.2, 0.3, 0.5, 0.7, 1.0, 1.5, and so on. Precision of a reported value is approximately plus or minus one bracket at 68 percent, or two brackets at 95 percent confidence. N = not present at lower limit of detection; G = greater than value shown; L = detected below value shown. Other elements that were not found at lower limit of detection are given in table 4]

Sample sites are shown on figure 1 as ●[3].

* = stream sediment sample.

Table 1. - continued

	SAMPLE	FIELD NO	Si%-S	Al%-S	Fe%-S	Mg%-S	Ca%-S	Na%-S	K%-S	Ti%-S
1	M125228	74ACH-258	10.00G	10.00	7.00	5.00	5.000	2.000	1.0	0.700
2	M125224	74ACH-254	10.00G	10.00	7.00	2.00	1.000	2.000	2.0	1.500
3	M125225	74ACH-255	10.00G	15.00	3.00	1.50	5.000	3.000	3.0	0.500
4	M125226	74ACH-256	10.00G	15.00	1.00	0.10	0.150	3.000	5.0	0.200
5	M125227	74ACH-257	10.00G	10.00	3.00	0.70	1.000	3.000	2.0	0.500
6	M125209	74ACH-225	7.00	0.70	7.00	10.00	0.200	0.015	0.0N	0.010
7	M125231	74ACH-261	10.00G	7.00	5.00	3.00	5.000	2.000	0.3	0.200
8	M125230	74ACH-260	10.00G	15.00	2.00	1.50	3.000	3.000	1.0	0.150
9	M125232	74ACH-262	10.00G	10.00	1.50	0.30	0.700	5.000	5.0	0.150
10	M125229	74ACH-259	10.00G	7.00	1.50	0.20	0.200	5.000	5.0	0.150
11	M125210	74ACH-231	10.00G	7.00	5.00	3.00	3.000	3.000	2.0	0.700
12	M125211	74ACH-232	10.00G	15.00	3.00	5.00	10.000G	1.500	0.0N	0.150
13	M125214	74ACH-237	10.00G	7.00	7.00	2.00	5.000	2.000	1.5	0.700
14	M125203	74ACH-213	10.00G	10.00	1.50	0.30	0.700	3.000	0.7	0.070
15	M125201	74ACH-211	10.00G	7.00	3.00	5.00	7.000	0.700	0.0N	0.200
16	M125202	74ACH-212	10.00G	7.00	3.00	5.00	5.000	1.000	0.0N	0.500
17	M125199	74ACH-209	7.00	0.70	5.00	10.00G	0.300	0.020	0.0N	0.010
18	M125200	74ACH-210	10.00G	5.00	3.00	3.00	1.500	2.000	1.0	0.700
*19	M125212	74ACH-235	10.00G	7.00	5.00	5.00	7.000	1.000	0.0N	0.500
20	M125213	74ACH-236	10.00G	7.00	2.00	0.30	0.500	3.000	0.7	0.150
21	M125215	74ACH-238	10.00G	10.00	0.50	0.10	0.700	3.000	5.0	0.050
22	M125204	74ACH-215	10.00G	10.00	5.00	3.00	7.000	2.000	0.7	0.300
23	M125205	74ACH-216	10.00G	7.00	5.00	3.00	3.000	1.500	1.0	0.200
24	M125207	74ACH-218	10.00G	10.00	1.50	0.50	0.700	3.000	5.0	0.200
25	M125206	74ACH-217	10.00G	1.50	7.00	10.00G	1.500	0.150	0.0N	0.500
*26	M125235	74ACH-263	10.00G	7.00	3.00	0.70	0.700	2.000	3.0	0.150
27	M125157	74ACH-140	10.00G	2.00	1.00	0.30	0.150	0.500	1.0	0.200
28	M125158	74ACH-141	1.50	1.00	0.50	7.00	10.000G	0.100	0.0N	0.030
29	M125220	74ACH-243	10.00G	7.00	5.00	2.00	1.500	1.500	2.0	0.300
30	M125221	74ACH-244	10.00G	0.70	3.00	10.00	0.150	1.000	1.5	0.050
31	M125234	74ACH-266	10.00G	5.00	3.00	0.10	0.700	0.500	1.0	0.500
32	M125159	74ACH-142	10.00G	3.00	1.50	0.50	0.700	0.500	0.7	0.300
33	M125194	74APA-93	10.00G	5.00	3.00	1.00	0.300	1.000	1.5	0.150
34	M125218	74ACH-241	0.07	0.05	0.07	10.00G	10.000	0.000N	0.0N	0.001
35	M125219	74ACH-242	10.00G	5.00	7.00	2.00	3.000	2.000	0.7	1.500
36	M125222	74ACH-245	10.00G	7.00	2.00	0.70	0.300	1.500	3.0	0.200
37	M125216	74ACH-239	10.00G	7.00	3.00	1.00	0.500	1.000	2.0	0.700
38	M125217	74ACH-240	10.00G	10.00	2.00	0.50	3.000	3.000	5.0	0.150
39	M125208	74ACH-219	10.00G	15.00	5.00	1.00	7.000	5.000	5.0G	0.300
40	M125223	74ACH-246	10.00G	7.00	7.00	1.50	3.000	3.000	3.0	1.500
41	M125233	74ACH-265	10.00G	7.00	2.00	0.70	0.700	2.000	3.0	0.150
42	M125160	74ACH-143	10.00G	7.00	3.00	2.00	7.000	3.000	2.0	0.700

Table 1.-continued

	SAMPLE	P%-S	Ag ppm-S	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Cu ppm-S
1	M125228	0.00N	0.N	0.N	300.	1.5	0.N	30.0	200.0	100.0
2	M125224	0.00N	0.N	50.	700.	3.0	0.N	30.0	150.0	100.0
3	M125225	0.00N	0.N	0.N	1500.	1.5	100.	15.0	50.0	30.0
4	M125226	0.00N	0.N	5.	500.	7.0	150.	0.0N	3.0	1.5
5	M125227	0.00N	0.N	7.	1000.	1.5	0.N	10.0	50.0	15.0
6	M125209	0.00N	0.N	50.	3.	0.0N	0.N	70.0	500.0	20.0
7	M125231	0.00N	0.N	30.	2000.	1.0	0.N	15.0	70.0	5.0
8	M125230	0.00N	0.N	1500.	1500.	1.5	0.N	7.0	30.0	3.0
9	M125232	0.00N	0.N	0.N	3000.	3.0	200.	2.0	3.0	5.0
10	M125229	0.00N	0.N	0.N	1000.	1.5	0.N	1.0	1.5	5.0
11	M125210	0.00N	0.N	5.	300.	1.0	0.N	20.0	150.0	100.0
12	M125211	0.00N	0.N	0.N	20.	0.0N	0.N	20.0	50.0	500.0
13	M125214	0.00N	0.N	2.	200.	1.0	0.N	15.0	3.0	70.0
14	M125203	0.00N	0.N	7.	300.	1.0	0.N	1.0	2.0	20.0
15	M125201	0.00N	0.N	0.N	20.	0.0N	0.N	20.0	30.0	500.0
16	M125202	0.00N	0.N	0.N	20.	0.0N	0.N	20.0	50.0	500.0
17	M125199	0.00N	0.N	30.	7.	0.0N	0.N	100.0	700.0	70.0
18	M125200	0.00N	0.N	5.	300.	1.0	0.N	15.0	100.0	70.0
*19	M125212	0.00N	0.N	0.N	30.	0.0N	0.N	30.0	50.0	500.0
20	M125213	0.00N	0.N	5.	300.	1.0	0.N	1.5	0.0N	15.0
21	M125215	0.00N	0.N	2.	300.	5.0	0.N	0.0N	2.0	1.5
22	M125204	0.00N	0.N	0.N	200.	0.7	0.N	20.0	150.0	50.0
23	M125205	0.00N	0.N	0.N	300.	0.0N	0.N	20.0	70.0	70.0
24	M125207	0.00N	0.N	5.	1000.	5.0	0.N	3.0	20.0	1.5
25	M125206	0.00N	0.N	0.N	20.	0.0N	0.N	70.0	1000.0	50.0
*26	M125235	0.00N	0.N	3.	300.	5.0	0.N	10.0	20.0	20.0
27	M125157	0.00N	0.N	3.	200.	0.7	0.N	2.0	15.0	10.0
28	M125158	0.00N	0.N	0.N	50.	0.7	0.N	1.5	10.0	10.0
29	M125220	0.00N	0.N	70.	500.	1.0	0.N	15.0	70.0	100.0
30	M125221	0.00N	0.N	0.N	100.	0.0N	0.N	50.0	1000.0	50.0
31	M125234	0.00N	0.N	0.N	300.	0.0N	0.N	15.0	30.0	10.0
32	M125159	0.00N	0.N	3.	300.	1.5	0.N	5.0	15.0	7.0
33	M125194	0.00N	0.N	150.	300.	2.0	0.N	20.0	50.0	30.0
34	M125218	0.00N	0.N	0.N	10.	0.0N	0.N	0.0N	0.0N	1.5
35	M125219	0.00N	0.N	0.N	30.	0.0N	0.N	20.0	70.0	100.0
36	M125222	0.00N	0.N	0.N	300.	15.0	0.N	10.0	20.0	50.0
37	M125216	0.00N	0.N	0.N	1000.	5.0	0.N	15.0	50.0	100.0
38	M125217	0.00N	0.N	0.N	1500.	5.0	300.	5.0	5.0	3.0
39	M125208	0.10	0.N	0.N	2000.	3.0	500.	5.0	20.0	5.0
40	M125223	0.70	0.N	7.	500.	2.0	0.N	15.0	7.0	20.0
41	M125233	0.00N	0.N	0.N	1000.	1.0	0.N	7.0	30.0	10.0
42	M125160	0.00N	0.N	3.	700.	1.5	0.N	15.0	70.0	20.0

Table 1.-continued

	SAMPLE	Ga ppm-S	La ppm-S	Li ppm-S	Mn ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Pb ppm-S
1	M125228	30.0	15.	0.N	1500.	0.N	0.N	0.N	100.0	15.
2	M125224	20.0	50.	0.N	1000.	0.N	0.N	0.N	70.0	20.
3	M125225	30.0	50.	0.N	1000.	0.N	0.N	0.N	30.0	10.
4	M125226	30.0	70.	0.N	200.	0.N	15.	0.N	0.7	20.
5	M125227	20.0	50.	0.N	500.	0.N	0.N	0.N	20.0	20.
6	M125209	0.0N	0.N	0.N	1500.	0.N	0.N	--	500.0	0.N
7	M125231	20.0	30.	0.N	1500.	0.N	0.N	0.N	50.0	30.
8	M125230	20.0	30.	0.N	1500.	0.N	0.N	0.N	50.0	30.
9	M125232	20.0	100.	0.N	1000.	0.N	7.	0.N	1.5	20.
10	M125229	20.0	50.	0.N	500.	0.N	7.	0.N	1.0	30.
11	M125210	30.0	10.	0.N	5000.	0.N	0.N	0.N	50.0	0.N
12	M125211	30.0	0.N	0.N	1000.	0.N	0.N	--	30.0	0.N
13	M125214	50.0	10.	0.N	1500.	0.N	0.N	0.N	5.0	7.
14	M125203	20.0	10.	0.N	300.	0.N	0.N	0.N	0.7	0.N
15	M125201	20.0	0.N	0.N	1000.	0.N	0.N	--	30.0	0.N
16	M125202	20.0	0.N	0.N	1500.	0.N	0.N	--	30.0	0.N
17	M125199	3.0	0.N	0.N	1500.	0.N	0.N	--	500.0	0.N
18	M125200	20.0	10.	0.N	3000.	0.N	0.N	0.N	50.0	0.N
*19	M125212	20.0	0.N	0.N	1500.	0.N	0.N	--	30.0	0.N
20	M125213	20.0	0.N	0.N	300.	0.N	0.N	--	0.0N	0.N
21	M125215	50.0	15.	200.	100.	0.N	0.N	0.N	0.0N	100.
22	M125204	30.0	15.	0.N	1500.	0.N	0.N	0.N	30.0	10.
23	M125205	20.0	0.N	0.N	1500.	0.N	0.N	--	20.0	200.
24	M125207	50.0	20.	0.N	300.	0.N	0.N	0.N	7.0	70.
25	M125206	7.0	0.N	0.N	1500.	0.N	0.N	--	1000.0	0.N
*26	M125235	15.0	10.	0.N	1000.	0.N	7.	0.N	15.0	30.
27	M125157	3.0	7.	0.N	150.	0.N	10.	0.N	7.0	10.
28	M125158	0.0N	30.	0.N	500.	0.N	0.N	0.N	5.0	0.N
29	M125220	30.0	30.	0.N	1000.	0.N	0.N	0.N	30.0	50.
30	M125221	7.0	30.	0.N	1000.	0.N	0.N	0.N	700.0	15.
31	M125234	7.0	15.	0.N	1000.	0.N	7.	0.N	30.0	0.N
32	M125159	5.0	20.	0.N	300.	0.N	0.N	0.N	7.0	7.
33	M125194	15.0	20.	150.	2000.	0.N	0.N	0.N	30.0	15.
34	M125218	0.0N	20.	0.N	70.	0.N	0.N	0.N	0.0N	0.N
35	M125219	30.0	10.	0.N	1500.	0.N	0.N	0.N	30.0	0.N
36	M125222	10.0	50.	0.N	500.	0.N	0.N	0.N	20.0	50.
37	M125216	30.0	30.	0.N	700.	0.N	7.	0.N	30.0	30.
38	M125217	20.0	150.	0.N	700.	0.N	0.N	100.	1.0	15.
39	M125208	50.0	200.	0.N	1000.	0.N	0.N	100.	10.0	15.
40	M125223	30.0	70.	0.N	3000.	0.N	30.	0.N	10.0	0.N
41	M125233	20.0	20.	0.N	500.	0.N	0.N	0.N	15.0	30.
42	M125160	20.0	30.	0.N	700.	0.N	0.N	0.N	15.0	50.

Table 1.-continued

	SAMPLE	Sc ppm-S	Sn ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zn ppm-S	Zr ppm-S	Hg ppm-inst
1	M125228	20.0	0.N	300.	200.	20.	5.0	200.	100.	0.08
2	M125224	20.0	0.N	150.	150.	20.	5.0	150.	100.	0.20
3	M125225	15.0	0.N	1000.	70.	10.	2.0	70.	50.	0.04
4	M125226	7.0	0.N	15.	0.N	50.	10.0	50.	300.	0.06
5	M125227	7.0	0.N	700.	70.	10.	2.0	100.	50.	0.04
6	M125209	5.0	0.N	10.	30.	0.N	1.0	100.	0.N	- -
7	M125231	10.0	0.N	1000.	70.	7.	1.5	100.	100.	0.06
8	M125230	7.0	0.N	1000.	50.	7.	1.0	200.	100.	0.04
9	M125232	5.0	0.N	300.	20.	20.	3.0	50.	200.	0.06
10	M125229	3.0	0.N	200.	30.	7.	3.0	70.	300.	0.04
11	M125210	20.0	0.N	100.	100.	10.	3.0	100.	50.	- -
12	M125211	30.0	0.N	700.	200.	0.N	1.0	30.	0.N	2.0
13	M125214	20.0	0.N	300.	200.	15.	3.0	100.	150.	0.10
14	M125203	10.0	0.N	200.	0.N	30.	7.0	20.	50.	0.06
15	M125201	20.0	0.N	500.	200.	0.N	1.0	50.	10.	- -
16	M125202	30.0	0.N	300.	300.	0.N	1.5	70.	10.	- -
17	M125199	5.0	0.N	20.	20.	0.N	1.5	100.	0.N	- -
18	M125200	15.0	0.N	70.	150.	10.	2.0	100.	50.	- -
*19	M125212	50.0	0.N	500.	300.	0.N	1.5	50.	0.N	- -
20	M125213	15.0	0.N	200.	10.	30.	5.0	15.	50.	- -
21	M125215	2.0	7.	150.	0.N	0.N	0.0N	20.	50.	0.04
22	M125204	20.0	0.N	500.	100.	10.	2.0	70.	20.	0.02
23	M125205	20.0	0.N	200.	150.	7.	2.0	150.	50.	- -
24	M125207	7.0	5.	300.	30.	7.	1.0	20.	70.	0.06
25	M125206	15.0	0.N	70.	70.	0.N	1.5	150.	20.	- -
*26	M125235	10.0	0.N	200.	70.	10.	3.0	70.	20.	0.08
27	M125157	3.0	0.N	30.	20.	7.	0.7	30.	20.	0.02
28	M125158	0.0N	0.N	1000.	10.	7.	0.0N	0.N	20.	0.02
29	M125220	30.0	0.N	100.	70.	70.	15.0	70.	70.	0.10
30	M125221	0.0N	0.N	20.	20.	0.N	0.7	70.	20.	0.06
31	M125234	10.0	0.N	200.	50.	20.	3.0	70.	50.	0.06
32	M125159	5.0	5.	150.	30.	15.	1.5	30.	50.	0.02
33	M125194	10.0	0.N	70.	50.	15.	3.0	100.	50.	0.08
34	M125218	0.0N	10.	70.	0.N	0.N	0.0N	0.N	0.N	0.06
35	M125219	20.0	0.N	100.	200.	15.	3.0	150.	100.	0.10
36	M125222	10.0	0.N	100.	30.	15.	3.0	50.	30.	0.04
37	M125216	15.0	0.N	100.	200.	15.	3.0	200.	200.	0.12
38	M125217	7.0	0.N	500.	30.	10.	1.5	30.	100.	0.04
39	M125208	7.0	0.N	1000.	20.	20.	3.0	50.	300.	0.04
40	M125223	7.0	0.N	300.	70.	15.	3.0	200.	300.	0.06
41	M125233	7.0	0.N	300.	30.	10.	3.0	30.	30.	0.10
42	M125160	20.0	0.N	500.	100.	15.	2.0	100.	70.	0.02

Table 1.-continued

	SAMPLE	FIELD NO	Si%-S	Al%-S	Fe%-S	Mg%-S	Ca%-S	Na%-S	K%-S	Ti%-S
43	M125176	74ACH-160	10.00G	7.00	5.00	2.00	5.000	1.500	2.0	0.500
44	M125177	74ACH-161	10.00G	10.00	0.70	0.15	0.700	3.000	5.0	0.050
45	M125172	74ACH-156	10.00G	5.00	1.50	0.50	0.700	1.000	2.0	0.150
46	M125173	74ACH-157	10.00G	2.00	1.50	0.70	0.200	0.500	1.0	0.200
47	M125174	74ACH-158	10.00G	3.00	3.00	0.50	0.030	0.200	1.0	0.200
48	M125175	74ACH-159	10.00G	5.00	2.00	1.00	1.000	1.000	2.0	0.200
*49	M125236	74ACH-264	10.00G	10.00	2.00	0.30	0.700	3.000	5.0	0.150
50	M125163	74ACH-146	10.00G	7.00	1.50	0.20	1.000	3.000	3.0	0.150
51	M125164	74ACH-147	10.00G	7.00	5.00	1.00	1.500	2.000	2.0	0.300
52	M125165	74ACH-148	10.00G	7.00	3.00	1.00	0.500	2.000	5.0	0.200
53	M125171	74ACH-155	10.00G	7.00	2.00	1.00	1.500	2.000	2.0	0.150
54	M125162	74ACH-145	10.00G	7.00	3.00	0.70	5.000	2.000	3.0	0.500
55	M125161	74ACH-144	10.00G	7.00	7.00	5.00	3.000	1.500	0.7	0.500
56	M125170	74ACH-154	10.00G	7.00	1.50	0.30	0.700	3.000	5.0	0.100
57	M125195	74APA-119-1	10.00G	10.00	0.70	0.15	0.700	3.000	3.0	0.050
58	M125196	74APA-119-2	10.00G	10.00	2.00	1.50	0.700	2.000	2.0	0.700
59	M125168	74ACH-152	10.00G	7.00	1.50	0.10	0.500	3.000	5.0	0.050
60	M125154	74ACH-137	10.00G	5.00	2.00	0.70	0.500	1.500	1.0	0.300
61	M125155	74ACH-138	10.00G	7.00	1.50	0.50	1.000	2.000	2.0	0.200
62	M125156	74ACH-139	10.00G	10.00	1.00	0.15	0.500	3.000	5.0	0.150
63	M125167	74ACH-151	10.00G	5.00	1.50	0.70	0.200	0.700	2.0	0.150
64	M125166	74ACH-150	10.00G	5.00	2.00	0.70	0.500	2.000	3.0	0.150
65	M125191	74ACH-171	10.00G	7.00	3.00	1.00	3.000	2.000	3.0	0.200
66	M125150	74ACH-130	10.00G	5.00	2.00	2.00	3.000	0.700	1.0	0.300
67	M125139	74ACH-112	10.00G	7.00	1.00	0.15	1.000	2.000	5.0	0.100
68	M125137	74ACH-110	10.00G	7.00	2.00	1.00	0.500	2.000	1.5	0.200
69	M125153	74ACH-136	10.00G	7.00	2.00	1.00	0.070	0.150	3.0	0.300
70	M125152	74ACH-133	10.00G	7.00	1.50	0.50	0.700	3.000	5.0	0.200
71	M125186	74ACH-176	10.00G	5.00	3.00	1.50	0.700	1.500	1.5	0.150
72	M125185	74ACH-175	10.00G	5.00	1.00	1.00	1.500	1.000	2.0	0.070
73	M125187	74ACH-177	10.00G	7.00	1.50	0.10	0.700	3.000	5.0	0.050
74	M125188	74ACH-178	10.00G	7.00	1.00	0.07	0.500	2.000	3.0	0.050
75	M125189	74ACH-179	10.00G	1.00	0.50	0.07	0.007	0.050	0.7	0.070
76	M125138	74ACH-111	10.00G	5.00	3.00	1.00	0.020	0.700	2.0	0.300
77	M125149	74ACH-128	10.00G	5.00	5.00	5.00	1.500	1.500	0.0N	0.300
78	M125192	74ACH-182	10.00G	0.70	1.00	0.10	0.015	0.070	0.2	0.050
79	M125136	74ACH-109	10.00G	7.00	3.00	0.20	1.500	2.000	3.0	0.150
80	M125135	74ACH-107	10.00G	7.00	5.00	2.00	3.000	3.000	1.5	0.500
81	M125151	74ACH-132	10.00G	7.00	2.00	0.70	0.700	3.000	5.0	0.300
82	M125142	74ACH-116	10.00G	5.00	2.00	0.70	0.300	0.700	2.0	0.300
83	M125141	74ACH-115	10.00G	7.00	0.70	0.05	0.300	3.000	5.0	0.030
84	M125140	74ACH-113	10.00G	7.00	7.00	5.00	7.000	2.000	0.5	0.700

Table 1.-continued

	SAMPLE	P%-S	Ag ppm-S	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Cu ppm-S
43	M125176	0.00N	0.N	0.N	1000.	1.5	0.N	20.0	30.0	20.0
44	M125177	0.00N	0.N	700.	300.	3.0	0.N	0.0N	1.0	3.0
45	M125172	0.00N	0.N	3.	1000.	3.0	0.N	5.0	10.0	10.0
46	M125173	0.00N	0.N	3.	300.	0.0N	0.N	7.0	20.0	20.0
47	M125174	0.00N	0.N	3.	200.	2.0	0.N	10.0	50.0	50.0
48	M125175	0.00N	0.N	2.	500.	1.0	0.N	10.0	30.0	15.0
*49	M125236	0.00N	0.N	15.	500.	5.0	150.	7.0	15.0	7.0
50	M125163	0.00N	0.N	2.	300.	7.0	200.	1.5	3.0	0.7
51	M125164	0.00N	0.N	0.N	700.	5.0	150.	10.0	50.0	7.0
52	M125165	0.00N	0.N	0.N	1000.	1.5	150.	10.0	70.0	50.0
53	M125171	0.00N	0.N	2.	500.	5.0	0.N	10.0	30.0	10.0
54	M125162	0.00N	0.N	0.N	1000.	3.0	0.N	7.0	20.0	7.0
55	M125161	0.00N	0.N	0.N	150.	0.7	0.N	15.0	150.0	7.0
56	M125170	0.00N	0.N	3.	1500.	7.0	150.	1.5	70.0	1.5
57	M125195	0.00N	0.N	1500.	700.	0.7	0.N	0.0N	3.0	2.0
58	M125196	0.00N	0.N	15000.	700.	5.0	0.N	3.0	150.0	150.0
59	M125168	0.00N	0.N	10.	200.	10.0	100.	0.0N	5.0	2.0
60	M125154	0.00N	0.N	10.	300.	3.0	150.	7.0	20.0	15.0
61	M125155	0.00N	0.N	0.N	1000.	3.0	0.N	5.0	7.0	7.0
62	M125156	0.00N	0.N	3.	300.	3.0	150.	0.0N	2.0	1.0
63	M125167	0.00N	0.N	15.	500.	1.5	0.N	7.0	20.0	20.0
64	M125166	0.00N	0.N	2.	500.	2.0	0.N	7.0	20.0	30.0
65	M125181	0.00N	0.N	0.N	1500.	2.0	0.N	15.0	30.0	15.0
66	M125150	0.00N	0.N	3.	500.	1.0	0.N	7.0	30.0	7.0
67	M125139	0.00N	0.N	2.	500.	5.0	200.	1.0	3.0	1.0
68	M125137	0.00N	0.N	30.	700.	1.0	0.N	7.0	200.0	7.0
69	M125153	0.00N	3.	150.	2000.	5.0	0.N	7.0	70.0	50.0
70	M125152	0.00N	0.N	15.	700.	5.0	0.N	3.0	7.0	1.5
71	M125186	0.00N	0.N	30.	700.	3.0	0.N	10.0	100.0	50.0
72	M125185	0.00N	0.N	5.	300.	3.0	0.N	5.0	20.0	7.0
73	M125187	0.00N	0.N	200.	300.	10.0	100.	0.0N	3.0	0.7
74	M125188	0.00N	0.N	3.	200.	7.0	100.	0.0N	1.5	0.7
75	M125189	0.00N	0.N	30.	150.	1.5	0.N	0.0N	7.0	10.0
76	M125138	0.00N	0.N	20.	700.	3.0	0.N	3.0	50.0	70.0
77	M125149	0.00N	0.N	0.N	15.	0.0N	0.N	15.0	150.0	100.0
78	M125192	0.00N	0.N	20.	300.	0.0N	0.N	10.0	10.0	70.0
79	M125136	0.00N	0.N	0.N	1000.	5.0	100.	2.0	5.0	10.0
80	M125135	0.00N	0.N	5.	300.	1.5	0.N	10.0	70.0	70.0
81	M125151	0.00N	0.N	0.N	700.	5.0	100.	5.0	10.0	15.0
82	M125142	0.00N	0.N	5.	500.	1.5	0.N	7.0	30.0	20.0
83	M125141	0.00N	0.N	7.	100.	10.0	0.N	0.0N	1.0	5.0
84	M125140	0.00N	0.N	0.N	100.	2.0	0.N	20.0	100.0	7.0

Table 1,-continued

	SAMPLE	Ga ppm-S	La ppm-S	Li ppm-S	Mn ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Pb ppm-S
43	M125176	20.0	50.	0.N	1000.	0.N	0.N	0.N	10.0	10.
44	M125177	15.0	7.	0.N	150.	0.N	7.	0.N	0.0N	50.
45	M125172	10.0	50.	100.	300.	0.N	0.N	0.N	7.0	15.
46	M125173	3.0	15.	0.N	300.	0.N	0.N	0.N	15.0	7.
47	M125174	15.0	10.	0.N	200.	0.N	0.N	0.N	30.0	7.
48	M125175	7.0	30.	0.N	500.	0.N	0.N	0.N	20.0	7.
*49	M125236	20.0	100.	0.N	500.	0.N	7.	0.N	7.0	50.
50	M125163	20.0	100.	300.	300.	0.N	10.	70.	0.0N	30.
51	M125164	20.0	70.	0.N	700.	0.N	0.N	0.N	15.0	10.
52	M125165	20.0	70.	150.	1000.	0.N	0.N	0.N	15.0	30.
53	M125171	20.0	70.	0.N	500.	0.N	10.	0.N	15.0	20.
54	M125162	20.0	50.	0.N	500.	0.N	7.	0.N	7.0	15.
55	M125161	15.0	20.	0.N	1000.	0.N	0.N	0.N	50.0	30.
56	M125170	20.0	50.	200.	200.	0.N	0.N	0.N	1.5	70.
57	M125195	20.0	0.N	0.N	200.	0.N	0.N	--	3.0	30.
58	M125196	70.0	50.	0.N	500.	0.N	0.N	0.N	20.0	7.
59	M125168	30.0	50.	500.	300.	0.N	10.	0.N	1.0	50.
60	M125154	7.0	70.	0.N	500.	0.N	0.N	50.	15.0	10.
61	M125155	15.0	20.	0.N	300.	0.N	7.	0.N	2.0	10.
62	M125156	15.0	70.	0.N	200.	0.N	10.	50.	3.0N	10.
63	M125167	10.0	15.	100.	700.	0.N	0.N	0.N	15.0	20.
64	M125166	15.0	20.	0.N	700.	0.N	0.N	0.N	7.0	10.
65	M125181	20.0	70.	0.N	700.	0.N	0.N	0.N	10.0	15.
66	M125150	7.0	20.	0.N	700.	0.N	0.N	0.N	15.0	15.
67	M125139	15.0	70.	0.N	200.	0.N	10.	50.	0.0N	30.
68	M125137	10.0	15.	0.N	700.	0.N	0.N	0.N	50.0	50.
69	M125153	20.0	20.	0.N	70.	7.	0.N	0.N	20.0	30.
70	M125152	20.0	30.	0.N	500.	0.N	0.N	0.N	5.0	10.
71	M125186	15.0	30.	0.N	700.	0.N	0.N	0.N	50.0	10.
72	M125185	7.0	15.	0.N	300.	0.N	0.N	0.N	10.0	15.
73	M125187	20.0	50.	300.	300.	0.N	20.	0.N	0.0N	70.
74	M125188	20.0	70.	500.	200.	0.N	20.	0.N	0.0N	50.
75	M125189	2.0	30.	0.N	30.	0.N	7.	0.N	0.7	7.
76	M125138	15.0	10.	0.N	300.	0.N	7.	0.N	15.0	0.N
77	M125149	10.0	0.N	0.N	1000.	0.N	0.N	--	100.0	0.N
78	M125192	1.5	15.	0.N	1000.	0.N	0.N	0.N	20.0	0.N
79	M125136	15.0	50.	0.N	700.	0.N	0.N	0.N	2.0	20.
80	M125135	20.0	15.	0.N	1500.	0.N	0.N	0.N	30.0	7.
81	M125151	20.0	50.	0.N	500.	0.N	0.N	0.N	3.0	10.
82	M125142	10.0	20.	0.N	500.	0.N	7.	0.N	15.0	7.
83	M125141	15.0	0.N	0.N	70.	0.N	10.	--	0.0N	50.
84	M125140	30.0	20.	0.N	2000.	0.N	0.N	0.N	50.0	10.

Table 1.-continued

	SAMPLE	Sc ppm-S	Sn ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zn ppm-S	Zr ppm-S	Hg ppm-inst
43	M125176	15.0	0.N	500.	70.	15.	3.0	100.	100.	0.04
44	M125177	3.0	10.	150.	0.N	15.	0.7	15.	15.	0.04
45	M125172	5.0	0.N	200.	20.	7.	0.7	50.	70.	0.02
46	M125173	7.0	0.N	50.	30.	10.	1.5	50.	70.	0.04
47	M125174	7.0	0.N	30.	70.	7.	2.0	100.	150.	0.06
48	M125175	7.0	0.N	200.	30.	15.	3.0	70.	70.	0.04
*49	M125236	7.0	0.N	300.	30.	20.	5.0	70.	30.	0.06
50	M125163	7.0	10.	200.	20.	50.	5.0	30.	100.	0.02
51	M125164	15.0	0.N	300.	70.	20.	3.0	70.	150.	N(.02)
52	M125165	15.0	0.N	300.	70.	15.	3.0	100.	70.	0.02
53	M125171	7.0	0.N	300.	70.	10.	3.0	70.	150.	0.02
54	M125162	7.0	0.N	500.	30.	15.	2.0	70.	100.	N(.02)
55	M125161	20.0	0.N	200.	200.	15.	3.0	100.	70.	0.02
56	M125170	5.0	0.N	200.	20.	15.	2.0	20.	100.	L(.02)
57	M125195	10.0	10.	200.	3.	30.	7.0	30.	15.	0.08
58	M125196	20.0	0.N	300.	200.	15.	5.0	70.	200.	0.06
59	M125168	7.0	20.	70.	0.N	70.	10.0	0.N	70.	0.02
60	M125154	7.0	0.N	150.	50.	20.	2.0	100.	50.	0.04
61	M125155	7.0	0.N	300.	30.	10.	1.5	50.	50.	0.02
62	M125156	3.0	0.N	100.	0.N	10.	1.0	0.N	30.	0.02
63	M125167	7.0	0.N	100.	30.	10.	2.0	50.	70.	0.02
64	M125166	7.0	0.N	200.	50.	10.	2.0	70.	150.	0.02
65	M125181	15.0	15.	500.	100.	20.	3.0	100.	30.	0.04
66	M125150	10.0	0.N	150.	50.	15.	1.5	70.	70.	0.02
67	M125139	5.0	0.N	200.	5.	20.	1.5	0.N	30.	L(.02)
68	M125137	10.0	0.N	150.	50.	10.	1.5	100.	100.	0.04
69	M125153	15.0	0.N	30.	300.	15.	3.0	100.	150.	0.04
70	M125152	7.0	0.N	200.	20.	15.	2.0	70.	30.	0.02
71	M125186	10.0	0.N	150.	100.	10.	3.0	100.	50.	0.45
72	M125185	7.0	0.N	200.	20.	10.	1.5	30.	70.	0.02
73	M125187	7.0	7.	100.	0.N	100.	15.0	0.N	100.	N(.02)
74	M125188	3.0	5.	70.	0.N	70.	7.0	20.	100.	0.02
75	M125189	3.0	0.N	5.	10.	0.N	0.0N	0.N	50.	0.02
76	M125138	15.0	0.N	70.	100.	7.	1.0	100.	50.	0.02
77	M125149	20.0	0.N	70.	150.	7.	1.5	100.	20.	0.04
78	M125192	7.0	0.N	10.	10.	0.N	0.0N	30.	15.	0.06
79	M125136	7.0	0.N	300.	20.	15.	2.0	50.	70.	N(.02)
80	M125135	15.0	0.N	200.	100.	10.	1.5	100.	70.	0.02
81	M125151	7.0	0.N	200.	30.	20.	3.0	70.	50.	L(.02)
82	M125142	10.0	3.	70.	30.	10.	2.0	70.	70.	0.04
83	M125141	0.0N	7.	70.	0.N	15.	2.0	0.N	7.	0.02
84	M125140	30.0	0.N	300.	200.	20.	3.0	150.	100.	0.04

Table 1.-continued

	SAMPLE	FIELD NO	Si%-S	Al%-S	Fe%-S	Mg%-S	Ca%-S	Na%-S	K%-S	Ti%-S
*85	M125197	74ACH-126	10.00G	7.00	3.00	1.00	1.000	2.000	2.0	0.500
86	M125148	74ACH-125	10.00G	5.00	5.00	5.00	5.000	1.500	0.2	0.700
87	M125191	74ACH-181	10.00G	7.00	2.00	0.50	0.030	2.000	1.0	0.200
88	M125190	74ACH-180	10.00G	7.00	3.00	1.00	0.100	1.000	1.5	0.150
89	M125193	74ACH-183	10.00G	5.00	2.00	1.00	0.070	1.500	1.5	0.150
90	M125182	74ACH-172	10.00G	7.00	5.00	1.50	0.700	2.000	1.0	0.500
91	M125183	74ACH-173	10.00G	7.00	3.00	1.00	0.030	0.700	3.0	0.200
92	M125184	74ACH-174	10.00G	3.00	5.00	3.00	0.700	1.500	0.0N	0.500
93	M125144	74ACH-119	10.00G	5.00	3.00	1.00	0.150	0.500	2.0	0.300
94	M125145	74ACH-120	10.00G	7.00	5.00	1.50	0.100	1.000	2.0	0.500
95	M125146	74ACH-122	10.00G	3.00	7.00	5.00	3.000	1.000	0.0N	0.200
96	M125147	74ACH-124	10.00G	5.00	3.00	1.50	0.700	1.000	1.5	0.300
97	M125143	74ACH-118	10.00G	5.00	3.00	1.50	0.150	0.500	2.0	0.300
98	M125169	74ACH-153	10.00G	3.00	3.00	5.00	0.300	0.700	1.0	0.150

Table 1,-continued

	SAMPLE	P%-S	Ag ppm-S	B ppm-S	Ba ppm-S	Be ppm-S	Ce ppm-S	Co ppm-S	Cr ppm-S	Cu ppm-S
*85	M125197	0.00N	0.N	70.	700.	5.0	100.	10.0	70.0	30.0
86	M125148	0.00N	0.N	0.N	100.	0.0N	0.N	20.0	50.0	30.0
87	M125191	0.00N	0.N	50.	300.	0.0N	0.N	7.0	30.0	10.0
88	M125190	0.00N	0.N	200.	700.	5.0	0.N	10.0	50.0	50.0
89	M125193	0.00N	0.N	100.	700.	3.0	0.N	7.0	30.0	20.0
90	M125182	0.00N	0.N	5.	700.	1.0	0.N	7.0	30.0	50.0
91	M125183	0.00N	0.N	100.	1000.	5.0	0.N	3.0	70.0	50.0
92	M125184	0.00N	0.N	0.N	30.	0.0N	0.N	30.0	10.0	50.0
93	M125144	0.15	0.N	150.	2000.	3.0	0.N	1.5	70.0	70.0
94	M125145	0.00N	0.N	70.	3000.	3.0	0.N	10.0	50.0	200.0
95	M125146	0.00N	0.N	0.N	50.	0.0N	0.N	20.0	150.0	100.0
96	M125147	0.00N	0.N	50.	1000.	3.0	0.N	5.0	50.0	100.0
97	M125143	0.00N	0.N	50.	300.	2.0	0.N	7.0	50.0	20.0
98	M125169	0.00N	0.N	20.	300.	1.0	0.N	15.0	500.0	50.0

Table 1.-continued

	SAMPLE	Ga ppm-S	La ppm-S	Li ppm-S	Mn ppm-S	Mo ppm-S	Nb ppm-S	Nd ppm-S	Ni ppm-S	Pb ppm-S
*85	M125197	20.0	70.	0.N	1000.	0.N	0.N	0.N	30.0	30.
86	M125148	15.0	0.N	0.N	1500.	0.N	0.N	--	50.0	0.N
87	M125191	10.0	30.	0.N	200.	0.N	0.N	0.N	20.0	0.N
88	M125190	10.0	20.	0.N	300.	0.N	7.	0.N	30.0	7.
89	M125193	10.0	30.	0.N	200.	0.N	0.N	0.N	30.0	7.
90	M125182	20.0	15.	0.N	700.	0.N	0.N	0.N	10.0	10.
91	M125183	20.0	10.	0.N	500.	0.N	0.N	0.N	20.0	20.
92	M125184	15.0	10.	0.N	1500.	0.N	0.N	0.N	50.0	0.N
93	M125144	15.0	20.	0.N	1000.	0.N	0.N	0.N	10.0	30.
94	M125145	20.0	0.N	0.N	1500.	0.N	0.N	--	50.0	7.
95	M125146	10.0	0.N	0.N	2000.	0.N	0.N	--	50.0	10.
96	M125147	20.0	10.	200.	1000.	0.N	0.N	0.N	30.0	7.
97	M125143	15.0	20.	0.N	300.	0.N	0.N	0.N	20.0	15.
98	M125169	10.0	0.N	0.N	700.	0.N	0.N	--	200.0	0.N

Table 1.-continued

	SAMPLE	Sc ppm-S	Sn ppm-S	Sr ppm-S	V ppm-S	Y ppm-S	Yb ppm-S	Zn ppm-S	Zr ppm-S	Hg ppm-inst
*85	M125197	15.0	0.N	200.	100.	20.	5.0	100.	150.	0.14
86	M125148	20.0	0.N	200.	150.	7.	1.0	100.	20.	L(.02)
87	M125191	10.0	0.N	70.	30.	10.	2.0	70.	200.	0.02
88	M125190	10.0	0.N	70.	70.	30.	5.0	100.	70.	0.04
89	M125193	10.0	0.N	150.	100.	20.	3.0	70.	150.	0.10
90	M125182	15.0	0.N	200.	150.	15.	3.0	150.	70.	0.02
91	M125183	15.0	0.N	100.	150.	10.	3.0	200.	70.	0.02
92	M125184	15.0	0.N	100.	200.	10.	3.0	200.	70.	0.02
93	M125144	15.0	0.N	100.	100.	15.	3.0	150.	100.	0.02
94	M125145	15.0	0.N	100.	100.	15.	5.0	200.	150.	0.02
95	M125146	30.0	0.N	100.	150.	10.	1.0	150.	0.N	0.02
96	M125147	15.0	0.N	200.	70.	10.	1.0	150.	50.	0.02
97	M125143	10.0	0.N	30.	70.	7.	1.5	150.	70.	0.02
98	M125169	10.0	0.N	15.	100.	0.N	1.5	100.	50.	0.06

Table 2.--*Semiquantitative spectrographic analyses of 14 rock samples*

[Analyst: J. L. Harris. Sample sites shown on figure 1 as +[A]. Other elements that were not found at lower limit of detection are given in table 4. Analytical values are reported in the series 0.1, 0.15, 0.2, 0.3, 0.5, 0.7, 1.0, 1.5 and so on. The standard deviation of any value is approximately +50 percent and -33 percent]

Map No.	Sample No.	Field No.	Si-pct	Al-pct	Fe-pct	Mg-pct	Ca-pct	Na-pct	K-pct	Ti-pct	P-pct	B-ppm	Ba-ppm	Be-ppm	Ce-ppm	Co-ppm	Cr-ppm	Cu-ppm	Er-ppm	Eu-ppm	Ga-ppm	Gd-ppm	La-ppm	Mn-ppm	Mo-ppm	Nb-ppm	Nd-ppm	Ni-ppm	Pb-ppm	Pr-ppm	Sc-ppm	Sm-ppm	Sr-ppm	Th-ppm	V-ppm	Y-ppm	Yb-ppm	Zn-ppm	Zr-ppm
A	M124750	68AMm-50	>30	3	0.3	0.05	0.15	3.0	5.0	0.05	0.1	20	100	3	<50	<1	<1	<1	<5	<1	15	<5	15	70	<1.5	20	<70	1	20	<3	1.5	<5	10	30	<1.5	15	3	<15	70
B	M124749	68AMm-25	20	5	5.0	5.0	7.0	>0.3	>1.5	0.3	0.15	<15	1500	<1	<70	50	300	70	<5	1	10	<15	30	1500	<1.5	<10	<70	100	10	5	70	<5	300	<20	200	20	3	70	70
C	M124748	68APa-12	>30	3	0.3	0.1	0.5	5.0	5.0	0.05	0.07	10	50	7	<50	<1	1.5	<1	<5	<1	15	< 5	30	300	3	15	<70	1	30	5	1.5	<5	15	30	3	15	3	<15	100
D	M124744	68AMm-15	30	7	2.0	1.5	5.0	>0.3	>1.5	0.3	0.1	10	1500	1.5	70	15	50	30	<5	1.5	20	<15	50	500	2	<10	<70	50	15	5	10	7	1000	50	100	10	1.5	30	200
E	M124743	68APa-18	>30	7	2.0	0.5	3.0	>0.3	3.0	0.2	0.15	10	2000	2	<70	10	20	30	<5	<1	20	<15	50	500	2	<10	<70	15	20	7	10	<5	700	30	70	10	1.5	20	150
F	M124747	68APa-9	30	7	3.0	2.0	5.0	>0.3	1.5	0.3	0.15	5	2000	1.5	100	20	100	50	<5	<1	20	<15	70	700	1.5	<10	<70	100	20	10	15	7	1500	<20	100	10	1.5	50	150
G	M124746	68APa-97	30	7	3.0	2.0	3.0	>0.3	1.0	0.2	0.1	20	1000	1.5	<50	10	50	70	<5	<1	20	<15	30	500	<1.5	<10	<70	30	15	<3	10	<5	1000	30	70	10	1	20	150
H	M124745	68APa-2	>30	7	3.0	1.0	3.0	>0.3	>1.5	0.3	0.15	10	2000	2	70	10	30	15	<5	<1	15	<15	70	300	<1.5	10	<70	1.5	30	10	10	7	2000	<20	70	10	1.5	<15	200
I	M124751	68AMm-62	20	5	7.0	3.0	7.0	>0.3	0.0	1.0	0.2	<15	30	1.5	<70	50	200	50	<5	3	20	<15	30	1500	<1.5	15	<70	100	7	10	30	<5	500	<20	200	20	5	70	200
J	M124738	68AMm-84	>30	7	3.0	1.5	3.0	>0.3	2.0	0.3	0.15	5	1500	2	100	15	30	70	<5	1.5	20	15	70	700	1.5	<10	<70	30	20	10	10	7	1500	<20	100	10	1.5	30	100
K	M124737	68AMm-67	>30	5	1.5	0.15	1.5	>0.3	5.0	0.1	0.07	7	500	5	200	2	3	<1	<5	1	15	15	150	300	<1.5	<10	70	50	20	15	5	15	200	50	10	20	3	<15	200
L	M124740	74APa-81	>30	5	1.5	0.2	2.0	>0.3	5.0	0.1	<0.07	15	300	7	150	2	3	<1	5	<1	20	<15	100	100	<1.5	15	100	1.5	50	15	5	10	150	50	10	50	7	<15	200
M	M124741	68AMm-72	>30	7	3.0	1.0	3.0	>0.3	5.0	0.3	0.15	10	1000	5	200	10	20	15	5	2	20	<15	150	300	<1.5	<10	<70	7	30	20	10	15	700	70	70	20	2	<15	200
N	M124739	74APa-53A	>30	7	3.0	0.7	2.0	>0.3	3.0	0.2	<0.07	20	700	5	70	7	20	7	<5	1	20	<15	50	700	<1.5	<10	<70	7	15	5	10	7	300	50	50	10	2	<15	100

Table 3.--*Ranges of amounts of 31 elements in samples from the Melozitna quadrangle*

[All analyses by semiquantitative spectrographic method, except Hg by mercury-vapor detector method. N(2) = not detected at the value shown]

Element	Background amounts (ppm); number of samples bracketed		Anomalous amounts (ppm); number of samples bracketed	
Ag	N(0.7)	[111]	3	[1]
B	N(2) - 200	[108]	700 - 15,000	[4]
Ba	3-2,000	[108]	3,000	[2]
Be	N(0.7) - 5	[102]	7 - 15	[10]
Ce	N(50) - 100	[97]	150 - 500	[15]
Co	N(1) - 100	[112]	---	[0]
Cr	N(0.7) - 500	[109]	700 - 1,000	[3]
Cu	N(1) - 100	[106]	150 - 500	[6]
Er	N(5)	[12][1]	5	[2]
Eu	N(1) - 3	[14][2]	---	[0]
Ga	N(0.7) - 30	[107]	50 - 70	[5]
Gd	N(15) - 15	[18]	---	[0]
Hg	N(0.02) - 0.10	[83]	0.12 - 2	[5]
La	N(7) - 100	[108]	150 - 200	[4]
Li	N(100)	[87]	100 - 500	[11]
Mn	30-1,500	[106]	2,000 - 5,000	[6]
Mo	N(2) - 3	[111]	7	[1]
Nb	N(10) - 20	[111]	30	[1]
Nd	N(20) - 50	[91][3]	70 - 100	[5]
Ni	N(0.7) - 200	[108]	500 - 1,000	[4]
Pb	N(7) - 50	[107]	70 - 200	[5]
Pr	N(3) - 15	[95][4]	20	[1]
Sc	N(0.7) - 30	[110]	50 - 70	[2]
Sm	N(5) - 15	[14][5]	---	[0]
Sn	N(2)	[85][6]	3 - 20	[13]
Sr	5-1,000	[109]	1,500 - 2,000	[3]
V	N(1) - 200	[109]	300	[3]
Y	N(7) - 50	[108]	70 - 100	[4]
Yb	N(0.7) - 7	[108]	10 - 15	[4]
Zn	N(15) - 150	[105]	200	[7]
Zr	N(3) - 300	[112]	---	[0]

[1]Does not include 4 samples reported as N(30).
[2]Does not include 98 samples reported as N(50).
[3]Includes 12 samples reported as <70.
[4]Includes 82 samples reported as N(20).
[5]Does not include 82 samples reported as N(50).
[6]Does not include 14 samples reported as <15.

Table 4.--*Elements not found, except as noted, in the semiquantitative spectrographic analyses*

[N(7) = Not found at lower limit of detection; value in ppm]

Element	Samples in table 1*	Samples in table 2
As	N(100)	N(70)
Au	N(7)	N(10)
Bi	N(5)	N(5)
Cd	N(7)	N(10)
Dy	N(20) [4 samples]	N(7)
Er	N(30) [4 samples]	See table 2
Eu	N(50)	--------Do.---------
Gd	N(5) [4 samples]	--------Do.---------
Ge	N(7)	N(3)
Hf	N(50)	N(20)
Ho	N(5) [4 samples]	N(3)
In	N(1.5)	N(5)
Ir	Not determined	N(7)
Lu	N(15) [4 samples]	N(3)
Os	Not determined	N(7) [12 samples; N(20) [2 samples]
Pd	--------do.--------	N(0.7)
Pr	N(20) [82 samples]	See table 2
Pt	N(5)	N(7)
Re	N(7)	N(10)
Rh	Not determined	N(0.7) [13 samples]; N(3) [1 sample]
Ru	--------do.--------	N(0.7)
Sb	N(20)	N(70)
Sm	N(50) [82 samples]	See table 2
Sn	See table 1	N(15)
Ta	N(50)	N(500)
Tb	N(100) [4 samples]	N(10) [13 samples]; N(50) [1 sample]
Te	N(300)	N(500)
Th	N(150)	See table 2
Tl	N(3)	N(5)
Tm	N(2)	N(3)
U	N(50)	N(150)
W	N(10)	N(10)

* Analyses for 98 samples, except as noted.

Table 5.--*Samples that contain elements in anomalous amounts grouped by geologic map units*

[See geologic map (Patton and others, 1978) for map units]

Map No.	Rock type	Elements present in anomalous amounts
	Unit Qfy -- YOUNGER FLOOD-PLAIN DEPOSITS	
19	Stream sediment; mafic and granitic rocks	Cu, Sc, V
49	Stream sediment; granite and quartzitic schist	Ce
85	Stream sediment; granitic rocks	Hg
	Unit TKv -- VOLCANIC ROCKS	
B	Basalt, flow	Sc
C	Rhyolite, flow or tuff	Be
	Unit Kg -- GRANODIORITE	
J	Granodiorite	Sr
4	Felsic flow	Be, Ce, Yb
9	Granitic rock	Ba, Ce
	Unit Kgm -- VOLCANIC GRAYWACKE AND MUDSTONE	
1	Sedimentary hornfels	Zn
2	Sedimentary hornfels	Hg
71	Conglomerate, grit	Hg
	Unit Km -- QUARTZ MONZONITE	
K	Quartz monzonite	Ce, La, Nd
L	Quartz monzonite	Be,Ce,Er,Nd
M	Quartz monzonite	Ce, Er, La, Pr
38	Granitic rock	Ce, La, Nd
39	Granitic rock	Ce, Ga, La, Nd
44	Granitic rock with tourmaline	B, Sn
50	Quartz monzonite/granite	Be, Ce, Li, Nd, Sn
59	Granitic rock	Be, Li, Sn, Y, Yb
62	Granitic rock	Ce
67	Quartz monzonite/granite	Ce
73	Granitic rock	Be, Li, Pb, Sn, Y, Yb
74	Granitic rock	Be,Li,Sn,Y
83	Granitic rock	Be, Sn

	Unit Kv -- ANDESITIC VOLCANIC ROCKS	
F	Andesite	Sr
H	Dacite, flow or hypabyssal	Sr
8	Altered volcanic, dacitic(?)	B, Zn
	Unit JPu -- ULTRAMAFIC ROCKS	
15	Gabbro	Cu
16	Gabbro	Cu, V
17	Hornblende anorthosite	Cr, Ni
30	Ultramafic rock, altered	Cr, Ni
	Unit JPb -- BASALT AND DIABASE	
6	Basalt or andesite(?)	Ni
11	Diorite	Mn
12	Basalt	Cu, Hg
13	Basalt/andesite	Ga
18	Basalt	Mn
23	Hornfelsic greenstone at granite contact	Pb
	Unit Pzm -- MARBLE	
34	Dolomitic marble at contact with gneiss	Sn
69	Quartz-mica schist interbedded with marble	Ag,Mo,V
	Unit Pz p€s -- PELITIC SCHIST	
25	Hornfelsic basalt	Cr, Ni
57	Quartz-tourmaline intrusive	B, Sn
58	Altered schist and greenstone	B, Cu, Ga
60	Hornfelsic quartzite at granite contact	Ce
65	Gneiss and granitic rock	Sn
84	Pyroxene hornfels	Mn
91	Quartz-mica schist	Zn
92	Basaltic greenstone	Zn
94	Quartz-mica schist	Ba, Cu, Zn
95	Calc-chlorite greenschist	Mn
96	Quartz-mica schist	Li
	Unit Pz p€q -- QUARTZITE	
82	Hornfels and quartzite	Sn

Unit Pz pЄn -- GNEISS AND QUARTZITE		
21	Gneiss and granitic rock, contact	Ga, Li, Pb, Sn
24	Granitic gneiss, quartzitic	Ga,Pb,Sn
29	Hornfelsic schist and granitic rock, contact	Y, Yb
32	Hornfelsic quartzite and quartz monzonite	Sn
33	Garnet-quartz-feldspar schist	Li, Mn
36	Granitic rock and gneissic schist	Be
37	Quartz-biotite schist	Hg, Zn
40	Quartzite schist, banded	Mn, Nb, Zn
45	Granitic gneiss	Li
51	Gneiss and granitic rock	Ce
52	Gneissic granitic rock	Ce, Li
56	Granite(?), near contact with gneiss	Be, Ce, Li, Pb
63	Gneiss	Li