Distribution of Gold, Copper and Some Other Metals in the McCarthy B-4 and B-5 Quadrangles, Alaska

By E. M. MacKevett, Jr., and James G. Smith

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Distribution of Gold, Copper, and Some Other Metals in the McCarthy B–4 and B–5 Quadrangles, Alaska

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Abstract

The main mineral commodities in the McCarthy B-4 and B-5 quadrangles, eastern Alaska, include copper, gold, silver, antimony, molybdenum, and arsenic. Analyses of stream-sediment and rock samples, and related geologic investigations, provide data on the metal contents of the previously known deposits, of several newly found deposits, of stream-sediment samples, and of many of the rocks and altered zones. Some of the newly found deposits probably merit more thorough examinations.

INTRODUCTION

Geochemical investigations were conducted during the summer of 1967 in the McCarthy B–4 and B–5 15-minute quadrangles, Alaska, and in small adjacent parts of the McCarthy A–4 and A–5 quadrangles, as part of the U.S. Geological Survey's Heavy Metals Program. The B–4 and B–5 quadrangles, which are centered about 250 miles east of Anchorage (fig. 1), include parts of the southern Wrangell Mountains and the contiguous Chitina Valley. The landforms of the B–4 and B–5 quadrangles have been strongly modified by glaciation and range in altitude from about 1,400 to 9,265 feet. Most of the mountainous regions are sparsely covered by vegetation and have good outcrops, but bedrock in the lowlands is generally obscured by diverse vegetation and extensive surficial deposits. The investigators utilized helicopter support concomitantly with other geologic studies in the region. The fieldwork consisted of collecting 105 stream-sediment samples and 146 samples from veins, altered zones, and rocks. G. R. Winkler ably assisted in the sampling. The samples were sieved to –180 mesh and analyzed in U.S. Geological Survey laboratories for gold by atomic absorption methods and for 33 other elements by semiquantitative spectroscopy. In addition to sampling virgin outcrops, numerous samples were collected from mines and prospects to augment the study of the region's mineral deposits and the interpretation of the general sampling. Results of previous geologic studies in the B–4 and B–5 quadrangles are mainly incorporated in reports by Moffit and Capps (1911), Moffit (1938), and MacKevett (1965).

GEOLOGY

Geologic Setting

The McCarthy B–4 and B–5 quadrangles are underlain largely by thick sequences of sedimentary and volcanic rocks that range in age from Permian and Permian(?) to Cretaceous and by diverse Quaternary surficial deposits (fig. 2). The older rocks are cut by Tertiary intrusive rocks, and near the northeast corner of the B–4 quadrangle are overlain by Tertiary continental sedimentary rocks that contain intercalated lava flows. The pre-Cretaceous rocks mainly occupy a northwest-trending belt along the south flank of the Wrangell Mountains. The southern part of this belt is overlapped by Cretaceous marine sedimentary rocks and by surficial deposits, the northern part by volcanic rocks of the extensive Wrangell Lava. The oldest rocks in the quadrangles are submarine lava flows and their derivative volcaniclastic rocks, which together constitute the Station Creek Formation of the Skolai Group (Smith and MacKevett, 1968). These rocks are slightly metamorphosed and are probably Permian in age. They are conformably overlain by slightly metamorphosed fossiliferous Permian rocks, the Hasen Creek Formation of the Skolai Group (Smith and MacKevett, 1968). Triassic rocks are represented by a local thin remnant of unnamed Middle Triassic sedimentary rocks; by extensive basalt flows, the Nikolai Greenstone of late Middle and (or) early Late Triassic age; by Late Triassic carbonate rocks, the Chitistone and Nizina Limestones; and by carbonaceous shales, cherts, and impure limestones of the Late Triassic part of the McCarthy Formation. Early Jurassic rocks, chiefly spiculites and shales, of the upper member of the McCarthy Formation are sparsely distributed in the northern parts of the B–4 and B–5 quadrangles. The pre-Cretaceous rocks were folded and faulted during the major orogeny of the region, near the close of the Jurassic or in the Early Cretaceous; most major structures are related to this period of deformation. Cretaceous clastic sedimentary rocks, largely of shallow marine origin, overlie the older rocks with a strong angular unconformity and are widely distributed throughout the southern parts of the B–4 and B–5 quadrangles (Jones and MacKevett, 1968). Quaternary surficial deposits, largely of fluvioglacial derivation, cover most low parts of the quadrangles.

Intrusive rocks in the quadrangles include gabbro, granodiorite, and altered felsic hypabyssal rocks. The gabbro is Permian or Triassic in age, and is confined to terrane underlain by Skolai Group rocks; it

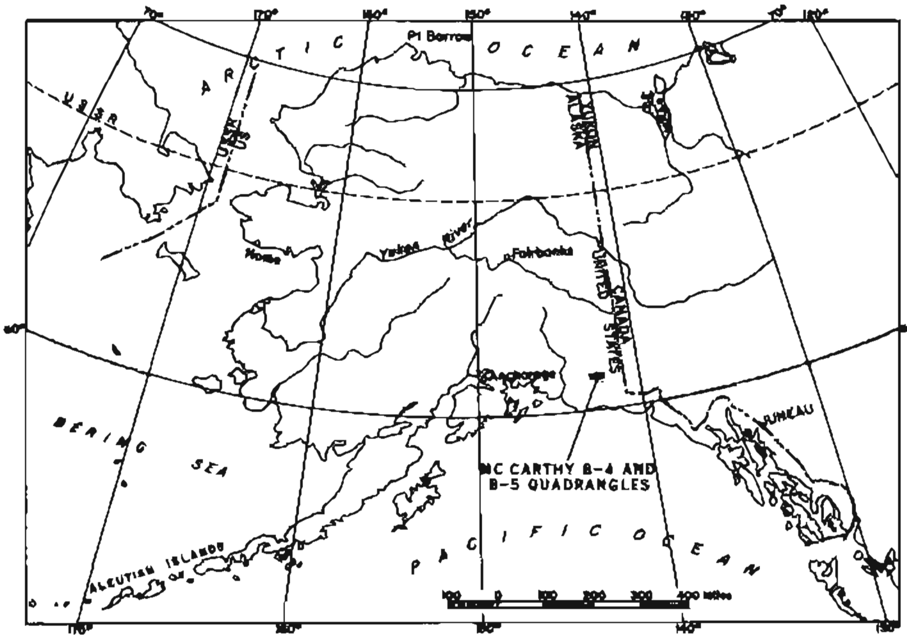


Figure 1.—Index map showing location of the McCarthy B-4 and B-5 quadrangles.

generally forms small discordant or concordant plutons. The granodiorite is Tertiary in age and forms small discordant stocks near Williams, Andrus, and Pyramid Peaks (fig. 2). The hypabyssal rocks, the youngest intrusives in the quadrangles, are also Tertiary. They form small stocks and numerous dikes and sills that commonly cut Cretaceous rocks. Most of the hypabyssal rocks are porphyritic rhyodacite and dacite that in places have been extensively altered to clay minerals, sericite, and chlorite. Intruded rocks near the gabbro, in particular those adjacent to the granodiorite, have been metamorphosed, chiefly to hornfels.

Hydrothermally altered zones, a few inches to 250 feet wide, are common in the eastern part of the B-4 quadrangle, where they are localized mainly along faults. The altered zones consist largely of copiously iron-stained yellowish- or reddish-brown leached or gougy material.

For the purpose of this report, formations that contain similar rock types have been grouped as follows in figure 2 regardless of their geologic ages:

1. All surficial deposits, such as alluvium, talus, rock glaciers, and diverse fluvioglacial deposits, and areas covered by glacier, snowfields, and water.
2. Volcanic and volcaniclastic rocks that include rocks of the Nikolai Greenstone and Station Creek Formation and basal flows of Wrangell Lava.
3. Detrital clastic rocks, mainly sandstone, shale, and mudstone. These rocks are largely Cretaceous, but they include subordinate Permian, Triassic, Jurassic, and Tertiary rocks.
4. Carbonate rocks of the Chitistone and Nizina Limestones.
5. Gabbro.
6. Intermediate intrusives, mainly granodiorite.
7. Felsic intrusive rocks of Tertiary age.

Summary of Economic Geology

The general region is best known for the massive copper sulfide lodes at the Kennecott mines, which are mainly in the nearby McCarthy C-5 quadrangle. For many years before 1938, when large-scale mining ceased at Kennecott, these mines were among the world's premier copper producers with a total production of about 1.2 billion pounds of copper and a significant byproduct of silver. The Kennecott lodes formed near the base of the Chitistone Limestone within a few hundred feet of its contact with the subjacent Nikolai Greenstone. Several small copper mines and prospects are localized in the basal Chitistone strata in the B-4 and B-5 quadrangles (fig. 2), but none have yielded significant production. Other copper deposits in these quadrangles consist of chalcopyrite, bornite, or chalcocite-rich veins in the Nikolai Greenstone, as exemplified by the Nikolai mine and the Radovan greenstone prospect, and of native copper and tenorite lodes localized between Nikolai Greenstone flows and in amygdules at the Erickson mine (fig. 2). Production from these deposits has been negligible. Native copper is sparsely distributed in a few of the Nikolai Greenstone amygdaloids, and copper sulfides are scattered along a fault zone that cuts Chitistone Limestone and Nikolai Greenstone at the Radovan low-contact prospect (fig. 2). Chalcopyrite is a minor to trace constituent at the Taylor, Porphyry Mountain, and Crumb Gulch prospects (fig. 2).

Gold valued at close to a million dollars has been recovered from the placers of Dan and Chititu Creeks and their tributaries. The few known gold lodes are in Tertiary intrusive rocks or in adjacent hornfelsed Cretaceous rocks.

Antimony has not been recovered from either the B-4 or the B-5 quadrangles, but stibnite is the major ore mineral of the Crumb Gulch lodes and a minor constituent of the Radovan low-contact prospect.

Molybdenite occurs in a lenticular quartz vein cutting Tertiary intrusive rocks at the Porphyry Mountain prospect (fig. 2) and as a sparse constituent of a few small quartz veins that cut Cretaceous rocks south of Dan Creek. Molybdenite-quartz float is widespread in the moraines of Canyon Creek Glacier, but its lode source probably is in the McCarthy B-3 quadrangle.

Silver is associated with the copper-sulfide and copper-iron-sulfide lodes and with the native copper and gold deposits. No commodities other than the aforementioned are known to exist in potentially recoverable quantities in the mines and prospects of the McCarthy B-4 and B-5 quadrangles.

Distribution of Metals

The significant metals in the quadrangles, gold, copper, silver, antimony, molybdenum, and arsenic, are discussed with regard to their distribution in (1) previously known deposits, (2) virgin outcrops, including veins, altered zones, and rocks, and (3) stream sediments. Analytical data for the rock, veins, and altered zone samples are given in table 1; similar data for the stream-sediment samples are given in table 2. The sample locations are shown in figure 2.

Samples from the known deposits do not necessarily represent the highest grade material available from the deposits. Several of these samples were taken to determine the extent of mineralized rock away from the lodes or to test structures that are not obviously mineralized. Most samples of rocks, altered zones, and veins were grab samples, although several chip or channel samples were taken at the mines and prospects and from the altered zones. The stream-sediment samples represent the finest grained material available at the sample site. Not enough sample information is available to determine adequately the background distribution of metals in the diverse rocks of the quadrangles. Consequently, the designation of anomalous values is somewhat arbitrary and is based on limited analytical data for the local rocks and on information obtained from the literature.

Gold

The highest concentration of gold, 66.0 ppm (parts per million), was detected in a channel sample (16)[1/] from the prospect north of Crumb Gulch. A few other samples from this prospect also contained anomalous amounts of gold. Samples from other known deposits that contained abnormal concentrations of gold are from the Taylor prospect (as much as 15.4 ppm (74)), and the Porphyry Mountain prospect.

The richest sample from a deposit not previously known is from slightly altered Station Creek volcaniclastic rock collected northeast of Canyon Creek. This sample contained 5.2 ppm gold (103). Samples from altered zones near Canyon Creek (87, 108) and from stibnite-quartz veins north of Eagle Creek (63) contained gold in excess of 1 ppm. Several lesser gold anomalies, reflected by samples that contained between 0.1 and 1 ppm gold, are from altered zones elsewhere in the quadrangles.

Stream-sediment sampling detected small anomalous concentrations of placer gold in most of the main drainages. Samples from several of the streams that have been worked for placer gold and from which gold can be panned fairly readily yielded surprisingly low gold values. This is probably attributable to the vagaries of sampling and possibly to the size distribution of the placer gold.

Some drainages not previously known to contain placer gold, such as those of Canyon and Toby Creeks and the Chitistone River, showed minor gold anomalies in their stream sediments. The highest gold concentration detected in the stream-sediment samples, 9.6 ppm (86), was from a stream along the north side of the Glacier Creek Glacier west of the Erickson mine.

Copper

Copper is the major valuable metal at most mines and prospects in the quadrangles. Many samples from copper deposits contained copper in excess of 20,000 ppm, the upper limit reported in the analytical results. Undoubtedly, samples that contain similar quantities of copper could be obtained by selective sampling at any of the known copper deposits. Minor and probably insignificant amounts of copper were detected in samples from some of the prospects for other metals.

Four deposits that contain possibly significant amounts of copper were found in Nikolai Greenstone terrane in the southeastern part of the B-4 quadrangle. The first of these deposits consists of secondary copper minerals that locally coat fractures in sheared greenstone adjacent to an altered zone 250 feet wide. A sample from this deposit contained 15,000 ppm copper (91), but a composite grab sample from the altered zone revealed only negligible amounts of ore metals (90). At the second locality, several narrow shear zones contain sporadically distributed secondary copper minerals. A sample of the richest appearing material in these zones carried 20,000 ppm copper (94). The third deposit comprises chalcocite and secondary copper minerals that form intermittent fracture fillings throughout a fault zone 6 feet wide. A selected sample from this deposit carried more than 20,000 ppm copper (96). The fourth deposit contains secondary copper minerals throughout a mineralized zone 1-2 feet thick that is enclosed in a fault zone 15 feet thick. A sample from the mineralized zone contained more than 20,000 ppm copper (108).

[1/] Numbers in parenthese refer to sample numbers given in table 1 or 2.

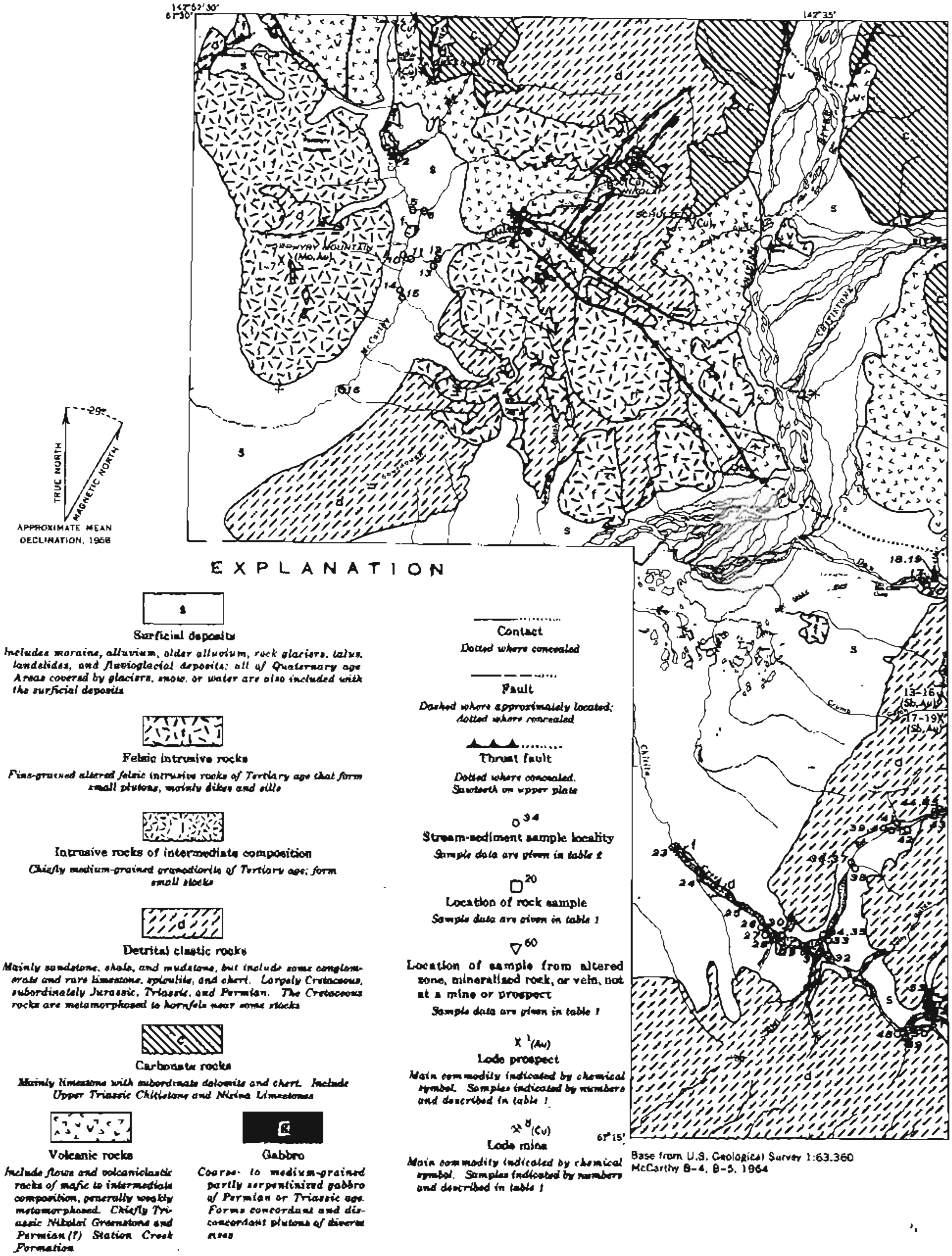
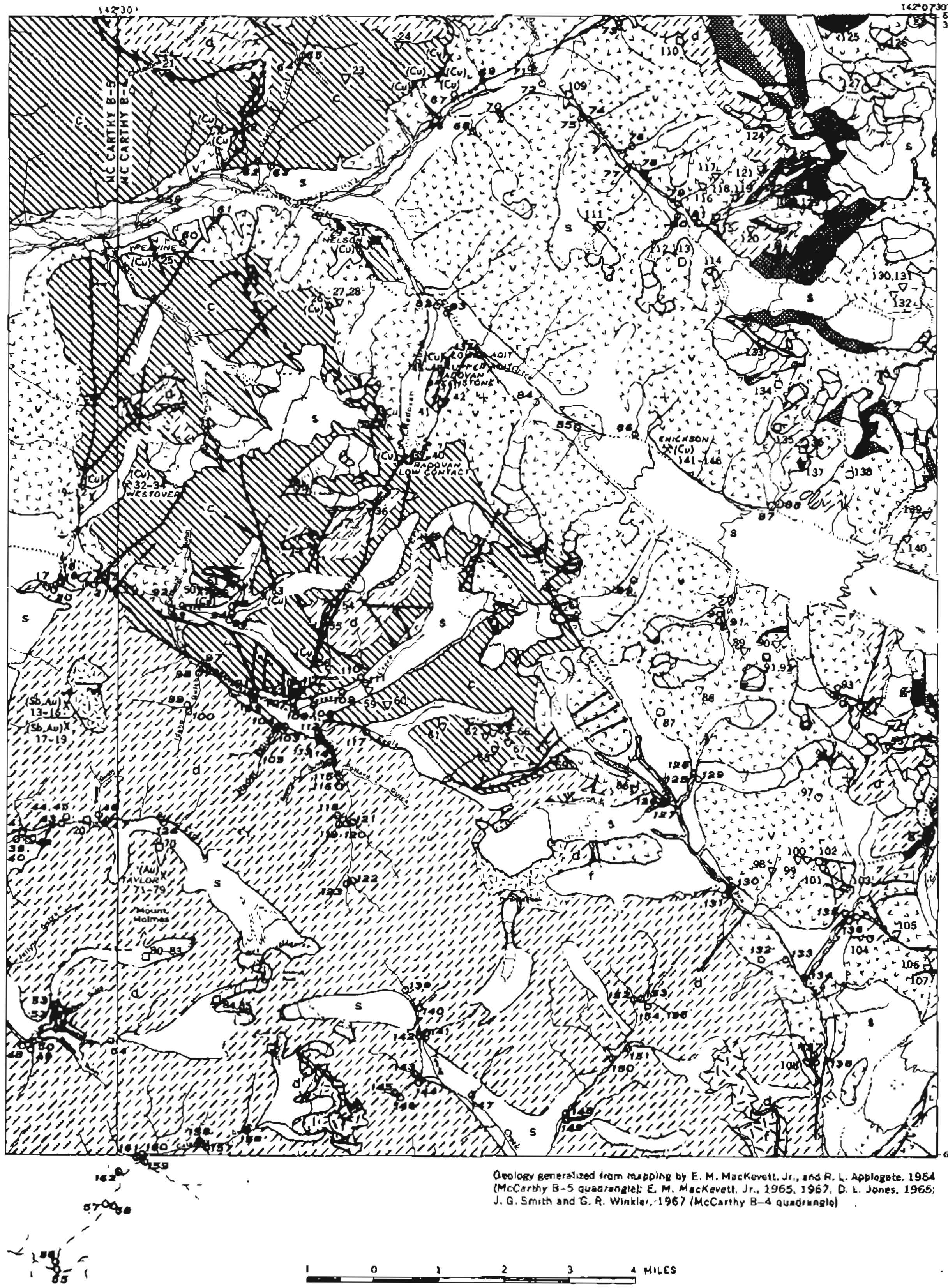


Figure 2.—Generalized geologic map showing quadrangles,



Geology generalized from mapping by E. M. MacKevett, Jr., and R. L. Applegate, 1964 (McCarthy B-5 quadrangle); E. M. MacKevett, Jr., 1965, 1967, D. L. Jones, 1965; J. G. Smith and G. R. Winkler, 1967 (McCarthy B-4 quadrangle)

sample locations in the McCarthy B-4 and B-5 Alaska.

Two copper deposits were found in the northeastern part of the B-4 quadrangle. One consists of spottily distributed azurite and malachite in a fault zone 1-4 feet thick that cuts the Nikolai Greenstone. A sample selected from the copper-enriched part of the fault zone contained 20,000 ppm copper (111). The other deposit consists of copper-stained patches that are scattered throughout an altered aureole of Station Creek volcaniclastic rocks contiguous to a gabbro pluton. A composite grab sample representative of the mineralized patches contained 20,000 ppm copper (129). A few other samples from altered zones in the B-4 quadrangle carried minor anomalous amounts of copper.

Native copper is concentrated in some of the gold placers of the region, generally in the form of small nuggets, but rarely as large slabs weighing from several tens to several hundred pounds. The placer deposits, however, probably do not contain enough copper to be exploited.

Many of the stream-sediment samples contained anomalous amounts of copper in concentrations of as much as 300 ppm. Most of the anomalous samples were from Toby Creek and from Glacier Creek and its tributaries.

Silver

Silver is chiefly associated with the copper deposits of the region. Except for the uncommon native silver associated with native copper, no discrete silver minerals were recognized in the deposits. The highest detected silver concentration, 100 ppm, was in a sample of float collected below the Radovan low-contact prospect (40). The second richest silver sample, from the native copper-tenorite lode at the Erickson mine, contained 70 ppm silver (142). Some samples from the Nelson prospect, Westover mine, the Radovan greenstone prospect, and the prospect west of Boulder Creek contained 50 ppm silver (29-33, 45, 46, 48). Other samples from these and other known copper deposits, from the prospect north of Crumb Gulch, and from the Taylor prospect carried lesser anomalous amounts of silver.

The highest silver content detected in the newly found deposits, 50 ppm, was from a copper deposit in the southeastern part of the B-4 quadrangle (108). Samples from the other copper deposits found in the eastern part of the B-4 quadrangle carried subordinate amounts of silver.

Four of the stream-sediment samples contained anomalous amounts of silver. The highest silver concentration, 5 ppm, was in a sample from Glacier Creek below the Erickson mine (85). Samples that contained 0.7 ppm silver were collected from the Chitistone River near the northern border of the B-4 quadrangle (73), from Toby Creek (79), and from Rader Gulch, a tributary of Dan Creek (105).

Antimony

Stibnite is the major ore mineral at the prospects north and south of Crumb Gulch. It occurs mainly in veins localized in a contact-metamorphic aureole of Cretaceous shales that have been converted to hornfels, or less extensively, in veins that cut granodiorite. Several samples representative of the veins at the Crumb Gulch prospects contained more than 10,000 ppm antimony, the upper limit that was reported in the analyses (13, 14, 17-19). Stibnite has been reported from veins at the Radovan low-contact prospect (Sainsbury, 1951, p. 15), and tetrahedrite probably is a rare constituent of many of the copper lodes.

Several subparallel stibnite-quartz veins as much as 2 feet thick and a few antimony-bearing altered zones as much as 6 feet thick were found cutting Nizina Limestone north of Eagle Creek. The stibnite forms scattered needlelike crystals or local high-grade masses in the veins. The extent of the veins along their strikes could not be determined because of surficial cover. Samples representative of the higher grade parts of these deposits contained more than 10,000 ppm antimony (62, 65, 66). A sample of altered material from a fault zone, 10 feet wide, cutting Nizina Limestone north of Texas Creek contained 1,500 ppm antimony (55). Samples from several other altered zones and from a few mines and prospects contained between 100 and 200 ppm antimony. A sample of mineralized breccia float collected from Texas Creek contained more than 10,000 ppm antimony (59). No anomalous concentrations of antimony were found in any of the stream-sediment samples.

Molybdenum

The only significant concentrations of molybdenum were in samples from the Porphyry Mountain molybdenum-gold prospect. At this prospect, molybdenite forms large flakes that generally are localized along selvages of a lenticular quartz vein that cuts Tertiary intrusive rocks. Most samples from the Porphyry Mountain prospect contained molybdenum in excess of 2,000 ppm, the highest concentration reported in the analyses (1-3, 6, 7). Molybdenum in amounts between 7 and 50 ppm was reported in samples from many of the mines, prospects, and altered zones of the region. A float sample of altered hornfels laced with quartz veinlets that was collected on a rock glacier southeast of Andrus Peak contained 100 ppm molybdenum (83).

Five of the stream-sediment samples contained 5 or 10 ppm molybdenum. Two of these samples are from tributaries of the Chitistone River near the western boundary of the B-4 quadrangle (60, 64). One is from a tributary of Canyon Creek (136), and the two others are from the headwaters of Young Creek (141, 142).

Arsenic

Anomalous amounts of arsenic were detected in samples from many of the known mines and prospects and from a few of the altered zones. Several samples from the Crumb Gulch antimony-gold prospects, where realgar and subordinate orpiment are localized in the veins, contained arsenic in excess of 10,000 ppm, the highest concentration reported in the analyses (14-17, 19). A sample from the Nelson prospect also contained more than 10,000 ppm arsenic and probably indicates enargite and tennantite in the deposits (31). Other high concentrations of arsenic were found in samples from the Westover mine, where arsenic probably is a constituent of sulfosalts, from the Radovan low-contact prospect, which contains realgar, and from a copper prospect south of Nikolai Butte (52).

The richest arsenic sample from a deposit not previously known contained 7,000 ppm arsenic; this sample was from a copper deposit in sheared Nikolai Greenstone (91). Only two of the stream-sediment samples revealed anomalous amounts of arsenic. One, from Toby Creek near its junction with the Chitistone River, contained 700 ppm arsenic (72); the other, from Rader Gulch, contained 300 ppm arsenic.

Other metals

Minor anomalous concentrations of many of the other metals that were sought in the semiquantitative spectrographic analyses were found both in mineralized rock samples and stream-sediment samples. Probably the most significant of these anomalous concentrations is tungsten that is associated with antimony deposits at the Crumb Gulch prospects and north of Eagle Creek. A sample from the prospect south of Crumb Gulch contained 10,000 ppm tungsten (19), and a sample from the stibnite-rich veins north of Eagle Creek contained 7,000 ppm tungsten (65).

A selected sample from a narrow altered zone in basal Chitistone Limestone at a copper prospect south of Nikolai Butte yielded 15,000 ppm lead, 10,000 ppm zinc, and 300 ppm cadmium (52).

SUMMARY AND SUGGESTIONS FOR PROSPECTING

The McCarthy B-4 and B-5 quadrangles contain numerous copper deposits, many of which carry subordinate amounts of silver, and a few deposits of gold, antimony, molybdenum, and arsenic. The geochemical and related geological investigations in the quadrangles provide additional information on the distribution of metals in known deposits as well as data on the newly found deposits. The investigations also indicate a few areas that probably merit additional examination.

Samples from some of the known deposits revealed concentrations of a few metals not previously reported, such as tungsten at the Crumb Gulch prospects and lead and zinc at a prospect south of Nikolai Butte. The apparently most significant of the previously unknown deposits are the copper lodes in the eastern part of the B-4 quadrangle and the stibnite lodes north of Eagle Creek. Our investigations do not provide adequate data on the size and grade of these deposits nor accurate appraisals of their potentials. Some of these deposits may justify further examinations. Other potential exploration targets in the B-4 quadrangle are the numerous altered zones, some of which are extensive, and the basal conglomerate of the Nikolai Greenstone, which contains abundant pyrite. Most of our samples from the altered zones and the conglomerate had low metal contents, but detailed sampling might disclose altered zones or parts of the conglomerate that have economic potential.

The minor gold anomalies in streams not previously known to contain placer gold, such as Toby and Canyon Creeks and the Chitistone River, and in altered rocks from near Canyon Creek, might warrant additional study as possible clues to large, low-grade bedrock gold sources. Likewise, more thorough stream-sediment sampling of the drainages of Toby, Canyon, and Glacier Creeks may lead to the discovery of additional copper deposits. Additional sampling and a thorough assimilation of all available sample data could conceivably disclose pathfinder elements that would aid in prospecting the region.

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Table 1.--Analyses of rocks, altered zones, and lodes

[Analyses by semiquantitative spectrographic methods, except for Au which was analyzed by
0.5, 0.3, 0.2, 0.15, 0.1, and so forth. N, not detected; L, detected but below limit of
by C. L. Forn, D. J. Grimes, R. T. Hoskins, and E. L. Moiser. Atomic absorption analyses
Looked for, but not detected: Cd, Hg, La, Pd, Pt, Ta, and Te; exceptions: Cd, 300 ppm in
and 140; 20 ppm in several other samples. Sample locations shown in fig. 2. Sc was

Sample	Lab. No. ACI-	Field No.	Parts per million												
			Ag	As	Au	B	Ba	Be	Bi	Co	Cr	Cu	Mo	Mn	Nb
1	027	67AMK55	L	200	0.2	L	20	N	N	N	N	15	>2,000	10	10
2	028	56	L	L	.3	L	200	L	N	N	N	20	>2,000	100	L
3	029	57	0.5	L	<.02	10	200	1	10	5	N	50	>2,000	70	L
4	030	58	L	200	.2	10	30	N	10	N	N	15	2,000	20	L
5	031	59	L	200	.6	10	10	N	L	N	N	30	500	30	L
6	032	60	1	200	2.4	10	30	N	10	N	N	50	>2,000	50	L
7	033	61	1	L	.9	10	30	N	N	N	N	100	>2,000	15	L
8	009	.2+23	N	N	<.02	15	70	N	N	50	500	50	7	1,000	10
9	082	67ASj228	3	N	.02	10	50	L	N	50	30	10,000	N	1,000	L
10	083	229	5	N	.04	L	20	N	N	70	30	>20,000	N	1,000	L
11	084	230	L	N	<.02	10	N	N	N	15	10	100	N	500	L
12	115	67AWK60	50	N	.1	10	70	N	N	70	30	>20,000	10	1,000	L
13	061	67AMK99	1	7,000	3	150	700	L	N	10	70	20	7	700	10
14	062	100	2	>10,000	11	50	500	N	N	5	30	30	5	50	L
15	063	101	15	>10,000	2.8	50	500	N	N	50	50	200	N	500	L
16	064	104	1.5	>10,000	66.0	150	700	1	N	5	70	30	10	70	10
17	058	93	N	>10,000	.08	70	700	1	N	15	50	50	10	700	10
18	059	95	N	10,000	.1	70	700	1	N	20	30	50	20	700	10
19	060	98	N	>10,000	.2	70	500	1	N	5	30	20	30	1,000	70
20	146	67ASj294A	N	N	<.02	30	700	1	L	10	20	100	N	1,000	L
21	126	67AMK230	N	2,000	.03	N	>5,000	N	N	100	50	100	N	1,500	L
22	144	67AWK120	N	N	<.02	20	50	N	N	70	200	300	5	1,500	10
23	140	67AMK242	1	200	.03	N	15	N	N	N	20	500	N	700	N
24	143	271	L	N	.04	150	150	N	N	10	70	200	5	100	10
25	136	237	N	500	<.02	N	10	N	N	5	N	1,500	N	200	L
26	094	188	1	1,000	.1	N	20	N	N	10	30	2,000	N	500	N
27	092	186	N	N	<.02	10	50	N	N	70	200	100	N	700	L
28	093	187	1.5	N	<.02	L	50	N	N	50	100	500	N	700	L
29	137	248	50	N	.2	N	N	N	N	N	N	>20,000	5	50	L
30	138	250	50	3,000	.1	N	N	N	N	N	N	>20,000	10	100	L
31	139	252	50	>10,000	.1	N	20	N	N	5	10	>20,000	5	200	L
32	068	130	50	2,000	.2	10	10	N	N	30	7	>20,000	5	200	L
33	069	131	50	2,000	.1	N	<10	N	N	100	N	>20,000	5	200	L
34	070	132	20	500	.1	15	30	L	N	15	15	>20,000	N	50	L
35	065	110	L	500	.2	N	20	N	N	N	30	20	N	150	N
36	034	69	N	1,000	.2	10	30	N	N	N	20	7	20	150	L
37	163	302	N	N	N	50	15	N	N	50	150	500	N	500	L
38	164	303	3	2,000	N	20	30	N	N	10	70	>20,000	7	300	L
39	165	304	N	700	N	70	30	N	N	30	150	700	N	500	L
40	166	305	100	N	N	L	70	N	N	30	150	>20,000	N	1,000	L
41	156	278	N	N	N	L	10	N	N	30	200	30	N	700	L
42	155	277	N	N	N	L	7	N	N	20	100	70	N	700	L
43	128	67ASj277	3	N	.01	20	L	N	N	30	30	10,000	N	1,500	L
44	129	278	3	N	<.02	20	20	N	N	50	50	>20,000	N	2,000	L
45	095	67AMK196	50	N	<.02	10	N	N	N	30	30	>20,000	N	700	L
46	096	197	50	N	.05	20	L	N	N	50	50	>20,000	5	1,000	L
47	097	199	30	N	.03	50	N	N	N	10	5	>20,000	N	700	L
48	098	201	50	N	.07	15	L	N	N	30	30	>20,000	5	1,000	L
49	025	49	N	N	.2	N	N	N	N	N	10	10	N	200	N
50	180	347	1	N	<.02	10	7	N	N	150	200	>20,000	N	1,000	10

See description of samples on pages 14–16.

from the McCarthy B-4 and B-5 quadrangles, Alaska

atomic absorption methods. Analyses reported to the nearest number in the series 1, 0.7,
determination; >, greater than; <, less than. Semiquantitative spectrographic analyses
by W. L. Campbell, A. L. Meier, R. L. Miller, M. S. Rickard, T. A. Roemer, and R. B. Tripp.
sample 52; La, 50 ppm in samples 127, 132, and 138; 30 ppm in samples 63, 85, 87, 103, 125,
detected in amounts between 5 and 30 ppm in most samples]

Parts per million--Continued										Percent				Sample
Ni	Pb	Sb	Sn	Sr	V	W	Y	Zn	Zr	Mg	Fe	Ca	Ti	
L	N	N	30	N	10	100	N	N	N	0.02	0.1	0.1	0.02	1
L	N	N	30	100	20	100	N	N	30	.2	.7	.3	.1	2
5	L	N	30	100	20	L	N	N	30	.05	1	.3	.1	3
L	N	N	20	N	10	N	N	N	N	.02	.07	.1	.01	4
L	N	N	N	N	10	N	N	N	N	.02	.1	.05	.01	5
L	N	N	30	N	15	100	N	N	N	.02	.15	.5	.02	6
L	N	N	15	N	15	N	N	N	N	.02	.2	.07	.02	7
100	N	100	N	N	300	N	15	N	50	5	15	1	.7	8
30	L	N	N	N	200	N	20	N	50	3	10	7	1	9
50	10	N	N	N	300	N	30	N	70	3	15	7	1	10
15	N	N	N	100	70	N	10	N	30	1	3	7	.3	11
50	20	N	N	150	300	N	20	N	50	2	15	5	1	12
30	15	>10,000	N	200	200	50	15	N	70	1	7	2	.5	13
10	15	>10,000	N	150	70	N	N	N	30	.2	3	.7	.2	14
50	20	700	N	150	100	N	10	200	50	1	15	3	.2	15
15	15	5,000	N	100	150	N	15	N	70	.5	10	.2	.5	16
30	L	>10,000	N	150	100	50	20	200	70	1	5	.5	.3	17
30	L	>10,000	N	100	100	300	15	N	50	.2	3	.2	.2	18
15	N	>10,000	N	200	100	10,000	15	N	20	.3	5	.15	.2	19
15	15	N	N	500	70	N	10	N	100	1.5	5	5	.2	20
500	30	N	N	500	30	N	10	N	N	2	>20	>20	.2	21
50	N	N	N	150	300	N	30	N	70	5	15	7	1	22
10	L	N	N	700	30	N	N	N	20	1.5	.1	>20	.03	23
20	10	N	N	2,000	200	L	50	N	150	.5	10	.5	>1	24
10	10	N	N	500	30	N	N	N	20	.7	1	>20	.03	25
10	L	N	N	500	150	N	15	N	20	1	2	>20	.07	26
50	L	N	N	200	500	N	30	200	70	5	10	7	.7	27
50	20	N	N	100	200	N	15	N	30	2	15	2	.5	28
N	10	N	N	200	15	N	N	N	N	3	.2	20	.01	29
N	10	N	N	300	15	50	N	N	10	5	.5	20	.01	30
10	15	N	N	N	50	50	N	N	15	.7	.2	3	.05	31
30	15	N	N	N	30	N	N	200	20	.07	5	2	.05	32
100	20	N	N	N	30	N	N	500	30	.02	7	.2	.03	33
15	10	N	N	N	50	N	N	N	70	.2	2	1	.15	34
10	L	100	N	300	50	N	L	N	10	>10	2	>20	.05	35
5	N	150	N	1,000	50	N	15	N	N	.3	.7	20	.03	36
70	N	N	20	100	200	70	20	N	70	1.5	7	2	.5	37
30	N	N	15	50	100	N	15	N	30	.7	15	1.5	.3	38
70	N	N	30	70	300	50	30	N	70	.5	15	2	.7	39
70	N	N	30	70	150	N	15	N	30	2	7	2	.5	40
70	N	N	N	100	200	N	15	N	70	2	7	5	.5	41
30	N	N	N	100	70	N	15	N	20	1.5	5	10	.2	42
30	L	N	N	N	300	N	15	N	30	1.5	10	10	.7	43
50	L	N	N	100	300	N	20	N	30	7	20	10	1	44
30	N	N	N	N	150	N	15	N	30	1	7	3	.3	45
50	L	N	N	N	200	N	20	N	30	2	10	5	.3	46
10	N	N	N	N	70	N	L	N	10	.7	3	10	.1	47
20	L	N	N	N	150	N	15	N	50	1.5	10	7	.3	48
5	L	N	N	700	30	N	L	N	10	1	1	>20	.02	49
100	70	N	N	70	300	N	30	N	70	1.5	10	2	.7	50

Sample	Lab. No. ACI-	Field No.	Ag	As	Au	B	Ba	Be	Bi	Co	Cr	Cu	Mo	Mn	Nb
			Parts per million												
51	179	67AMK346	N	N	<0.02	100	70	1.5	N	10	150	500	N	500	N
52	178	345	10	7,000	<.02	L	20	L	N	150	15	1,000	30	200	N
53	045	67AWK42	30	N	<.02	L	L	N	N	20	30	>20,000	10	500	L
54	022	67AMK39	N	200	<.02	10	50	N	N	N	30	5	N	100	N
55	023	41	N	300	<.02	10	30	N	N	N	30	7	N	100	N
56	175	340	N	N	<.02	20	20	N	N	20	100	300	N	700	10
57	176	341	N	N	<.02	50	30	N	N	15	200	200	15	1,000	N
58	177	342	N	N	<.02	20	30	N	N	50	150	500	5	700	N
59	019	31	N	500	<.02	10	30	N	N	N	15	15	10	150	L
60	018	29	L	200	<.02	15	100	N	N	N	50	10	N	200	L
61	017	22	.5	N	<.02	L	15	N	N	15	30	20	N	500	L
62	015	11	N	700	.1	10	300	N	N	N	30	20	7	100	10
63	035	67AWK40-1	N	N	1.2	15	700	L	N	7	30	15	20	500	L
64	036	40-2	N	L	.2	20	300	L	N	15	20	20	10	500	L
65	013	67AMK9	N	700	.2	10	50	N	N	N	10	10	15	50	20
66	014	10	N	500	.1	10	50	L	N	N	5	70	30	100	10
67	012	8	N	N	<.02	30	70	N	N	N	70	30	N	30	15
68	026	52	N	500	.2	30	30	N	N	N	20	10	N	30	10
69	010	3	N	N	<.02	20	200	L	N	50	30	150	N	1,500	L
70	147	67ASj297	2	N	.03	20	500	1	L	5	15	700	N	200	L
71	049	174	.5	N	<.02	10	200	L	10	20	50	500	20	1,500	L
72	050	175	.7	N	<.02	L	20	L	10	50	30	2,000	10	1,000	L
73	051	176	N	N	<.02	10	500	1	N	20	30	50	5	700	L
74	052	177	.5	N	15.4	10	150	L	50	10	100	200	30	1,500	L
75	053	178	5	N	5.0	10	70	L	N	15	30	2,000	10	1,500	L
76	054	179	N	N	3.2	10	150	L	N	10	100	50	20	2,000	L
77	112	67AMK212	1	N	<.02	10	700	L	N	15	30	200	10	500	L
78	113	213	1	N	.1	20	200	L	70	50	50	1,500	20	2,000	10
79	114	214	5	N	6.8	10	100	N	20	5	20	500	10	1,000	L
80	122	67AWK99A	N	N	<.02	10	500	1	N	20	70	30	N	1,000	10
81	123	99B	N	N	.03	15	1,000	1	N	15	70	50	N	700	10
82	124	99C	N	N	.03	10	700	L	N	15	100	50	7	500	10
83	125	99D	N	N	.1	1,000	1,000	1	N	50	100	100	100	700	10
84	120	98E	N	N	.07	10	1,000	L	N	30	70	70	N	700	L
85	121	98H	N	N	<.02	50	700	1.5	N	5	5	20	N	700	10
86	011	67AMK6	N	500	<.02	20	10	N	N	50	30	30	N	1,500	L
87	021	67ASj95C	N	N	<.02	150	300	1.5	N	N	5	10	N	700	10
87*	038	95C	N	N	3.6	50	70	L	N	10	L	30	N	700	L
88	008	19B	N	N	<.02	20	100	N	N	50	300	30	N	1,500	L
89	057	182	N	N	.02	30	20	N	N	70	300	100	N	1,000	L
90	055	180B	N	N	.04	10	15	L	N	20	70	70	N	1,000	L
91	056	180C	2	7,000	.04	70	10	N	N	30	70	15,000	N	700	L
92	078	186B	N	N	<.02	50	150	L	N	50	50	300	5	1,000	10
93	048	171	N	N	<.02	50	50	L	N	50	150	100	N	700	L
94	047	169B	2	300	<.02	30	200	L	N	20	50	20,000	N	700	L
95	042	161	N	N	.02	70	300	1	N	70	200	200	N	1,000	L
96	004	15A	7	1,000	<.02	10	10	N	N	30	100	>20,000	N	1,000	10
97	005	16	N	N	.4	30	10	N	N	30	70	200	N	1,000	10
98	003	13	N	N	<.02	L	20	L	N	50	70	200	N	1,000	L
99	002	11	N	200	<.02	70	100	L	N	70	200	70	N	2,000	10
100	001	9	N	N	<.02	30	1,000	L	N	50	200	50	N	1,000	10
101	007	18C	N	N	<.02	50	3,000	N	N	50	150	70	N	1,000	L
102	006	18A	.5	200	<.02	20	1,000	L	N	5	15	50	50	1,000	10
103	020	8S	L	N	5.2	30	500	2	N	20	30	20	N	700	10
103*	037	8S	N	N	.8	50	500	2	N	15	15	30	5	700	10

*Duplicate.

Parts per million--Continued										Percent				Sample
Ni	Pb	Sb	Sn	Sr	V	W	Y	Zn	Zr	Mg	Fe	Ca	Ti	
100	50	N	N	L	200	N	50	1,000	150	1	7	0.2	1	51
300	15,000	N	N	L	20	N	N	10,000	20	.15	15	3	.07	52
10	100	N	N	150	70	N	N	N	20	.3	15	2	.15	53
10	L	N	N	1,500	70	N	10	N	10	.3	.7	>20	.05	54
15	L	1,500	N	1,000	50	N	10	N	20	.3	1.5	>20	.07	55
50	30	N	N	150	70	N	10	N	30	5.0	3.0	10	.3	56
100	L	N	N	200	300	N	30	N	70	1.5	5.0	5	.5	57
70	10	N	N	300	300	N	20	N	70	1.5	7.0	5	.5	58
10	10	>10,000	N	500	20	N	N	N	10	.5	.7	20	.02	59
15	L	150	N	300	70	N	10	N	20	.5	1.5	20	.07	60
50	L	N	N	500	100	N	20	N	20	.5	10	20	.1	61
10	N	>10,000	N	200	70	500	10	N	30	.05	2	.2	.5	62
20	L	N	N	500	100	N	15	N	100	1.5	3	3	.3	63
30	L	100	N	200	70	N	10	N	20	2	3	7	.2	64
5	N	>10,000	N	300	10	7,000	10	N	10	.03	1	1	.1	65
7	N	>10,000	L	150	10	500	N	N	10	.03	.7	.2	.03	66
7	L	N	N	300	200	50	10	N	150	.15	10	1.5	>1	67
10	N	200	N	500	50	100	N	N	100	.07	2	.5	.3	68
50	L	N	N	150	200	N	20	L	30	3	15	20	.5	69
5	10	N	10	200	50	N	N	N	70	1	5	.1	.2	70
30	N	N	N	150	100	50	15	N	30	1.5	15	7	.2	71
50	N	N	N	100	50	N	15	N	20	1.5	>20	5	.1	72
20	L	N	N	500	100	N	15	N	150	1.5	5	5	.3	73
20	L	N	20	300	200	N	20	N	70	2	15	15	.3	74
15	N	N	N	N	50	50	10	N	20	1.5	15	10	.1	75
20	L	N	N	200	150	N	20	N	50	2	15	15	.3	76
30	10	N	N	500	100	N	L	N	200	2	5	3	.3	77
30	N	N	N	150	100	N	10	N	30	1.5	20	20	.2	78
5	N	N	N	N	70	N	L	N	30	.7	20	7	.15	79
20	15	N	N	200	150	N	15	N	70	3	7	5	.5	80
20	15	N	N	500	150	N	15	N	100	2	7	2	.5	81
50	L	N	N	300	200	N	20	N	100	3	10	5	.5	82
50	N	N	N	700	200	N	20	N	150	2	10	3	.5	83
20	L	N	N	200	150	N	15	N	70	2	7	2	.3	84
5	15	N	N	500	50	N	10	N	100	1.5	5	3	.3	85
50	L	100	N	150	200	N	30	N	30	1.5	10	20	.5	86
5	10	100	N	300	20	N	20	N	200	.7	3	5	.3	87
15	10	N	N	150	30	N	L	N	50	2	3	7	.1	87*
100	L	100	N	150	200	N	15	N	20	5	10	10	.5	88
50	L	150	N	150	200	N	20	N	30	3	10	15	.5	89
30	L	100	N	150	100	N	10	N	30	7	7	15	.3	90
30	N	N	N	150	200	N	20	N	50	2	10	10	.7	91
50	L	150	N	150	200	N	20	N	50	5	10	15	.7	92
50	N	150	N	N	200	50	20	N	50	1.5	10	7	1	93
30	N	N	N	700	200	N	15	N	30	1.5	10	10	.5	94
70	L	200	N	100	300	70	20	N	70	2	15	5	1	95
70	N	100	N	N	200	N	15	N	50	3	10	7	.7	96
70	N	N	N	100	200	L	20	N	70	2	15	10	1.0	97
70	L	150	30	150	200	N	15	N	10	5	10	20	.2	98
100	L	200	N	100	300	N	30	N	100	1.5	15	2	1	99
70	L	150	N	150	200	N	15	N	50	2	15	7	1	100
70	N	N	N	200	300	N	20	N	50	2	10	3	1	101
50	20	N	N	150	200	N	20	200	30	.15	2	.5	.15	102
20	10	100	N	100	150	N	30	N	150	.7	10	3	.5	103
5	L	L	N.	100	70	N	30	N	150	.7	7	5	.5	103*

*Duplicate

Table 1.--Analyses of rocks, altered zones, and lodes from

Sample	Lab. No. ACI-	Field No.	Parts per million												
			Ag	As	Au	B	Ba	Be	Bi	Co	Cr	Cu	Mo	Mn	Nb
104	039	67ASj97	N	N	<0.02	20	70	N	N	30	100	100	N	700	L
105	046	96	N	N	< .02	70	100	N	N	50	70	300	N	1,000	L
106	161	315	N	N	N	30	150	N	N	20	70	150	N	1,000	L
107	162	316	N	N	.02	50	700	N	N	30	200	100	N	700	L
108	040	133	50	N	1.3	15	50	N	N	20	100	>20,000	N	500	L
109	016	67AMK19	L	N	<.02	10	300	N	N	50	300	100	5	1,000	L
110	079	67ASj196A	L	N	<.02	20	70	N	N	70	200	100	5	1,000	10
111	116	67AWK64	2	500	<.02	10	10	L	N	10	50	20,000	N	700	L
112	118	87	N	N	<.02	30	20	L	N	100	50	100	N	3,000	L
113	119	88	N	N	<.02	100	10	N	N	70	70	100	N	1,000	L
114	145	127A	N	N	.03	70	700	1	N	50	70	50	7	1,000	10
115	109	67ASj267	N	500	<.02	200	700	L	N	70	300	100	5	3,000	L
116	135	293	N	N	.02	100	70	N	N	70	100	300	N	2,000	10
117	134	292	L	N	<.02	50	1,000	N	N	70	15	500	N	2,000	L
118	107	266B	N	N	<.02	70	500	L	N	15	N	20	N	2,000	L
119	108	266C	N	N	<.02	30	300	L	N	70	300	150	N	2,000	10
120	110	268A	N	N	<.02	70	3,000	L	N	10	N	20	N	2,000	L
121	130	280	N	N	.04	70	1,500	N	N	50	100	100	N	1,500	L
122	104	247	N	N	<.02	50	200	L	N	30	70	100	N	2,000	L
123	103	246A	N	N	<.02	15	2,000	L	N	50	30	50	N	2,000	L
124	132	285A	L	N	<.02	100	2,000	L	N	70	100	100	N	2,000	10
125	127	274B	1	N	.06	50	500	5	N	50	150	30	N	1,500	10
126	133	290A	N	N	<.02	20	200	2	N	70	50	50	5	3,000	L
127	111	270C	N	N	<.02	10	700	3	N	15	20	100	N	1,000	50
128	099	232B	N	N	.04	50	70	L	N	50	7	200	5	1,500	L
129	117	67AWK77	2	N	.06	30	200	L	N	100	5	20,000	N	2,000	L
130	150	67ASj303A	N	N	<.02	70	500	L	N	20	300	50	5	1,000	10
131	151	303B	N	N	<.02	50	200	L	N	30	200	50	5	1,500	10
132	152	304A	N	N	<.02	50	700	3	N	10	5	300	5	2,000	20
133	131	282	.5	N	<.02	30	500	L	N	70	100	100	5	1,500	10
134	043	164	L	N	<.02	20	500	L	N	30	70	150	N	1,000	L
135	044	165	N	N	.02	30	200	L	N	30	70	150	N	1,000	L
136	100	236	L	N	<.02	20	700	L	N	50	100	100	7	1,000	10
137	101	237	N	N	<.02	20	1,000	L	N	50	70	100	N	2,000	L
138	102	240B	L	N	<.02	20	700	1.5	N	10	20	100	N	1,000	20
139	105	264B	N	N	<.02	10	2,000	L	N	15	20	50	N	1,000	L
140	106	265	N	N	<.02	10	1,000	L	N	10	5	50	15	500	L
141	148	298	L	N	<.02	20	50	N	N	70	300	500	N	2,000	10
142	172	325	70	N	N	N	30	N	N	30	150	>20,000	N	1,000	L
143	173	326	20	N	N	N	20	N	N	30	200	>20,000	N	1,500	L
144	174	327	7	N	<.02	10	L	N	N	50	300	20,000	N	1,500	10
145	167	67AMK318A	15	N	N	N	10	N	N	50	300	>20,000	N	2,000	L
146	168	318B	30	L	N	N	20	N	N	20	150	>20,000	N	1,500	L
Limit of															
			0.5	200	0.02	10	5	1	10	5	5	5	5	10	10

the McCarthy B-4 and B-5 quadrangles, Alaska--Continued

Parts per million--Continued										Percent				Sample
Ni	Pb	Sb	Sn	Sr	V	W	Y	Zn	Zr	Mg	Fe	Ca	Ti	
50	N	100	N	100	300	N	20	N	70	2	10	7	>1	104
50	N	N	N	100	300	N	20	N	30	1.5	10	7	.7	105
30	N	N	N	70	200	N	15	N	70	1.5	7	3	.7	106
70	N	N	N	200	300	N	20	N	100	1.5	7	3	.7	107
50	L	100	N	100	150	N	20	N	70	1.5	5	3	.7	108
100	L	100	N	150	300	N	20	N	30	3	10	5	.5	109
70	L	N	N	100	200	N	20	N	70	3	15	10	1	110
20	N	N	N	700	200	N	20	N	50	3	10	20	.5	111
100	N	N	N	200	150	N	20	N	30	7	20	20	.2	112
70	L	N	N	N	500	N	20	N	50	3	15	7	1	113
50	10	N	N	500	150	N	30	200	100	3	10	10	.7	114
100	L	N	N	300	200	N	30	N	50	5	20	20	.7	115
100	L	N	N	200	500	N	20	200	50	7	15	10	1	116
100	20	N	N	300	300	N	20	L	50	7	15	10	.5	117
5	L	N	N	500	100	N	30	N	100	2	10	7	.5	118
100	L	N	N	200	700	N	30	N	200	5	15	10	>1	119
5	15	N	N	500	70	N	20	500	30	5	7	15	.2	120
50	L	N	N	200	300	N	20	L	50	2	15	10	.5	121
30	10	N	N	150	150	N	20	N	50	5	10	10	.5	122
50	N	N	N	150	150	N	15	N	20	3	15	10	.2	123
70	10	N	N	300	500	N	20	200	70	7	20	15	.7	124
50	150	N	N	N	200	N	30	N	150	3	10	20	.5	125
30	20	N	N	700	200	N	20	200	50	7	15	10	.3	126
15	20	N	L	100	100	N	70	N	1,000	.2	10	.5	.5	127
15	L	100	N	150	200	N	20	L	50	3	15	10	.7	128
50	10	N	N	200	300	N	20	N	30	5	15	10	.7	129
70	10	N	N	150	100	N	10	N	100	3	7	10	.3	130
100	15	N	N	700	70	N	L	N	50	3	7	10	.3	131
10	20	N	N	200	20	N	30	L	300	1.5	10	7	.15	132
70	20	N	N	N	500	N	20	200	100	3	15	7	1	133
50	L	N	N	200	200	N	20	N	50	3	10	7	.7	134
30	L	N	N	150	200	N	20	N	50	3	10	7	.5	135
50	L	N	N	100	200	N	20	N	70	3	10	5	.7	136
30	L	N	N	200	150	N	10	N	30	5	10	20	.3	137
15	50	N	20	150	100	N	30	N	300	.5	5	.7	.15	138
15	10	N	N	N	100	N	15	N	70	1.5	5	2	.15	139
5	15	N	N	N	70	N	20	N	150	1	5	.5	.5	140
100	10	N	N	N	500	N	20	N	70	7	15	7	>1	141
70	N	N	N	N	300	N	20	N	70	3	7	1.5	.7	142
70	N	N	N	N	300	N	15	N	50	3	7	.7	.7	143
100	L	N	N	N	300	N	20	N	70	3	7	2.0	.7	144
70	N	N	N	50	300	N	20	N	150	3	10	1.5	.7	145
50	N	N	N	N	300	N	15	N	50	2	7	1.5	.7	146

determination

2	10	100	10	50	10	50	10	200	20	0.02	0.05	0.05	0.001

Description of samples given in table 1

[Unless otherwise noted, all samples are grab samples. Sample locations are shown in fig. 2]

Sample	Prospect or mine	Description
1	Porphyry Mountain molybdenum-gold prospect	12-in. channel sample across molybdenite-quartz vein.
2	-----do-----------------	18-in. channel sample across molybdenite-quartz vein.
3	-----do-----------------	Molybdenite-quartz vein.
4	-----do-----------------	12-in. channel sample across molybdenite-quartz vein.
5	-----do-----------------	9-in. channel sample across molybdenite-quartz vein.
6	-----do-----------------	10-in. channel sample across molybdenite-quartz vein.
7	-----do-----------------	Molybdenite-quartz vein.
8	Nikolai mine ------------	12-in. channel sample across altered zone.
9	Copper prospect west of Boulder Creek.	9-in. channel sample across mineralized shear zone.
10	-----do-----------------	Chip sample, 12-in. long, spaced at 2-in. intervals across mineralized shear zone.
11	-----do-----------------	12-in. channel sample across quartz-calcite vein.
12	-----do-----------------	Bornite-rich pod in shear zone.
13	Antimony-gold prospect north of Crumb Gulch.	12-in. channel sample across vein and gouge.
14	-----do-----------------	3-in. channel sample across vein.
15	-----do-----------------	12-in. channel sample across shear zone.
16	-----do-----------------	-----do-----------------
17	Antimony-gold prospect south of Crumb Gulch.	12-in. channel sample across vein.
18	-----do-----------------	16-in. channel sample across vein.
19	-----do-----------------	Vein.
20	------------------------	Felsic dike.
21	------------------------	Altered zone, 30 ft thick, cutting Chitistone Limestone.
22	Prospect north of Chitistone River.	Altered Nikolai Greenstone.
23	------------------------	Altered zone cutting Nizina Limestone.
24	------------------------	Altered zone, 8 ft thick, cutting Nizina Limestone.
25	Peavine prospect --------	Vein 4 in. wide.
26	Prospect southwest of Nelson prospect.	Composite grab sample from calcite-rich altered zone, 3 ft thick, in Chitistone Limestone.
27	------------------------	Altered zone, 2 ft thick, at Nikolai Greenstone-Chitistone Limestone contact.
28	------------------------	Altered and leached Nikolai Greenstone.
29	Nelson prospect, No. 4 adit.	Chip sample, 12-in. long, spaced at 1-in. intervals across vein.
30	-----do-----------------	Chip sample, 24 in. long, spaced at 1-in. intervals across vein.
31	-----do-----------------	Vein 2 in. thick vein.
32	Westover mine No. 1 adit.	24-in. channel sample across lode.
33	-----do-----------------	18-in. channel sample across lode.
34	North of portal of Westover No. 1 adit.	Chip sample, 15 ft long, spaced at 1-ft invervals across copper-stained altered zone.
35	------------------------	Altered zone, 2 ft thick, cutting Chitistone Limestone.
36	------------------------	Altered zone, 10 ft thick, cutting lower member of McCarthy Formation.
37	Radovan low-contact prospect.	Altered zone, 12 in. thick, in basal Chitistone Limestone.
38	-----do-----------------	Float from main shear zone.
39	-----do-----------------	Main shear zone 10 ft wide.
40	-----do-----------------	High-grade float.
41	------------------------	Chip sample, 8 ft long, spaced at 6-in. intervals across altered zone cutting Nikolai Greenstone.
42	------------------------	Altered zone, 15 ft thick, cutting Nikolai Greenstone.
43	Radovan greenstone prospect lower adit.	12-in. channel sample across mineralized fault zone cutting Nikolai Greenstone.
44	-----do-----------------	15-in. channel sample across mineralized fault zone cutting Nikolai Greenstone.
45	Radovan greenstone prospect upper adit.	14-in. channel sample across vein.
46	-----do-----------------	8-in. channel sample across vein.
47	-----do-----------------	6-in. channel sample across vein.
48	-----do-----------------	12-in. channel sample across vein.
49	------------------------	Altered zone, 10 ft wide, cutting Nizina Limestone.
50	Prospect south of Nikolai Butte.	Chip sample, 10 ft long, spaced at 6-in. intervals across mineralized zone.
51	-----do-----------------	Thin altered zone along contact between Nikolai Greenstone and Chitistone Limestone.
52	-----do-----------------	Altered zone a few inches thick in basal Chitistone Limestone.
53	Prospect east of Nikolai Butte.	Scattered copper minerals in sheared Nikolai Greenstone.
54	------------------------	Altered fault zone 50 ft thick.
55	------------------------	Altered zone, 10 ft thick, cutting Nizina Limestone.
56	Prospect in thick altered zone north of Hancock Pass.	
57	Prospect south of Hancock Pass.	Chip sample, 12 ft long, spaced at 4-in. intervals across altered zone.

Description of samples given in table 1—Continued

Sample	Prospect or mine	Description
58	Prospect south of Hancock Pass.	Composite grab sample from an altered zone, 8 ft wide.
59	------------------------	Breccia float.
60	------------------------	Fault zone, 10 ft wide, cutting Nizina Limestone.
61	------------------------	Altered fault zone, 20 ft thick, cutting Nizina Limestone.
62	------------------------	Altered zone, 6 ft thick, cutting Nizina Limestone.
63	------------------------	Quartz vein, 6 in. thick, cutting Nizina Limestone.
64	------------------------	-----do-----------------
65	------------------------	Stibnite-quartz-calcite vein, 6 in. thick, cutting Nizina Limestone.
66	------------------------	Stibnite-bearing quartz vein and silicified zone, 3 ft thick, cutting Nizina Limestone.
67	------------------------	Altered zone, 6 ft thick, cutting Nizina Limestone.
68	------------------------	Altered zone, 8 ft thick, cutting Nizina Limestone.
69	------------------------	Altered fault zone, 15 ft thick, separating Chitistone Limestone and Nikolai Greenstone.
70	------------------------	Felsic dike cut by quartz veinlets.
71	Taylor prospect ---------	Chip sample, 20 ft long, spaced at 9-in. intervals across altered zone.
72	-----do-----------------	Composite grab sample selected from altered zone 20 ft wide.
73	-----do-----------------	Felsic dike.
74	-----do-----------------	Chip sample, 30 ft long, spaced at 9-in. intervals along exposed length of altered zone.
75	-----do-----------------	Quartz-rich pod in altered zone.
76	-----do-----------------	Chip sample, 10 ft long, spaced at 6-in. intervals across weakly altered hornfels.
77	-----do-----------------	Pyritized intrusive rock.
78	-----do-----------------	Altered zone, 6-in. wide, in hornfels.
79	-----do-----------------	Gossan.
80	------------------------	Hornfels, float.
81	------------------------	Tertiary intrusive rock, float.
82	------------------------	Hornfels, float.
83	------------------------	Altered hornfels cut by quartz veinlets, float.
84	------------------------	Hornfels, float.
85	------------------------	Tertiary intrusive rock, float.
86	------------------------	Altered zone, 6 ft thick, in Nikolai Greenstone.
87	------------------------	Altered dike.
88	------------------------	Chip sample across altered zone, 10 ft wide, spaced at 6-in. intervals; altered zone cuts Nikolai Greenstone.
89	------------------------	Altered fault zone, 10 ft thick, cutting Nikolai Greenstone.
90	------------------------	Composite grab sample from altered zone about 250 ft wide that cuts Nikolai Greenstone.
91	------------------------	Copper minerals in sheared Nikolai Greenstone adjacent to altered zone of sample 90.
92	------------------------	Sheared Nikolai Greenstone in altered fault zone.
93	------------------------	Altered fault zone, 4 ft wide, separating Nikolai Greenstone and volcanic rocks of the Station Creek Formation.
94	------------------------	Thin mineralized shear zone in Nikolai Greenstone.
95	------------------------	Altered zone, 20 ft wide, cutting Station Creek volcanic rocks.
96	------------------------	Copper minerals in fault zone, 6 ft thick, cutting Nikolai Greenstone.
97	------------------------	Altered zone, 10 ft wide, cutting Nikolai Greenstone.
98	------------------------	-----do-----------------
99	------------------------	Altered zone, 2 ft thick, cutting Nikolai Greenstone.
100	------------------------	Altered zone, 50 ft thick, cutting Nikolai Greenstone.
101	------------------------	Thin altered zone near base of Nikolai Greenstone.
102	------------------------	Black shale of Hasen Creek Formation.
103	------------------------	Altered Station Creek volcaniclastic rock.
104	------------------------	Altered zone, 5 ft wide, in Nikolai Greenstone.
105	------------------------	Chip sample spaced at 6-in. intervals across altered zone 20 ft wide cutting Nikolai Greenstone.
106	------------------------	Altered zone, 6 ft thick, cutting Nikolai Greenstone.
107	------------------------	Composite grab sample from altered fault zone, 20 ft wide, separating Nikolai Greenstone and rocks of the Hasen Creek Formation.
108	------------------------	Composite grab sample representative of copper-bearing zone 1–2 ft wide within an altered zone 15 ft wide.
109	------------------------	Conglomerate from basal Nikolai Greenstone.
110	------------------------	-----do-----------------
111	------------------------	Mineralized fault zone, 1–4 ft thick, cutting Nikolai Greenstone.
112	------------------------	Altered Nikolai Greenstone.
113	------------------------	-----do-----------------
114	------------------------	Altered zone, 10 ft wide, in Nikolai Greenstone.

Description of samples given in table 1—Continued

Sample	Prospect or mine	Description
115	----------------------	Shear zone, 1 ft wide, near contact between Nikolai Greenstone and Hasen Creek Formation.
116	----------------------	Altered zone, 10-20 ft thick, in Nikolai Greenstone.
117	----------------------	Composite grab sample from altered zone, 50 ft thick, near base of Nikolai Greenstone.
118	----------------------	Thin calcite-quartz veinlets in altered zone in basal conglomerate of Nikolai Greenstone.
119	----------------------	Basal conglomerate of Nikolai Greenstone.
120	----------------------	Thin altered zone along contact of felsic sill cutting Hasen Creek Formation.
121	----------------------	Composite grab sample of altered zone, 20 ft thick, near contact between Middle Triassic rocks and Nikolai Greenstone.
122	----------------------	Altered zone, 10 ft wide, cutting gabbro sill.
123	----------------------	Altered zone, 3 ft wide, cutting gabbro.
124	----------------------	Composite grab sample from altered zone, 20 ft thick, cutting basal conglomerate of Nikolai Greenstone.
125	----------------------	Thin altered zone cutting gabbro.
126	----------------------	Altered zone, 10 ft wide, cutting Tertiary lavas.
127	----------------------	Altered Station Creek volcaniclastic rock.
128	----------------------	Altered contact zone, 3-10 ft wide, between gabbro and Hasen Creek rocks.
129	----------------------	Composite grab sample from altered contact zone, 3-10 ft wide, between gabbro and Hasen Creek rocks.
130	----------------------	Altered felsic dike.
131	----------------------	-----do---------------
132	----------------------	Chip sample, 6 ft long, spaced at 6-in. intervals, of altered Station Creek volcanic rock.
133	----------------------	Basal conglomerate of Nikolai Greenstone.
134	----------------------	-----do---------------
135	----------------------	-----do---------------
136	----------------------	-----do---------------
137	----------------------	Altered zone, 3 in. thick, cutting basal conglomerate of Nikolai Greenstone.
138	----------------------	Volcaniclastic rock from Station Creek Formation.
139	----------------------	Altered zone, 6 in. wide, cutting Station Creek rocks.
140	----------------------	Composite grab sample from altered zone, 50-200 ft wide, that cuts Station Creek volcaniclastic rocks.
141	Erickson mine----------	Nikolai Greenstone that contains mineralized amygdules.
142	-----do---------------	Rubbly basal part of a Nikolai Greenstone flow that contains native copper and tenorite.
143	-----do---------------	Copper-rich lode from stope.
144	-----do---------------	Copper minerals in basal part of a Nikolai Greenstone flow.
145	-----do---------------	Native copper-bearing Nikolai Greenstone.
146	-----do---------------	-----do---------------

Table 2.--Analyses of stream-sediment samples from

[Analyses by semiquantitative spectrographic methods, except Au which was analyzed by atomic
0.1, and so forth. N, not detected; L, detected but below limit of determination; >, greater
Forn. Atomic absorption analyses by A. L. Meier, R. A. Miller, and T. A. Roemer. Looked for,
5 ppm in sample 85, 0.7 ppm in samples 73, 79, and 105; As, 700 ppm in sample 72, 300 ppm in
sample 124; Zn, 300 ppm in sample 105, 200 ppm in samples 73, 85, 99, 100, and 137. Where
are shown in parentheses]

Sample	Lab. No. ACP-	Field No.	Parts per million Au	B	Ba	Be	Co	Cr	Cu	La	Mn
1	243	67ASj56	L	50	700	L	15	100	50	L	500
2	242	55	L	50	700	L	5	70	50	N	300
3	229	42	L	70	1,500	L	10	70	50	L	500
4	228	41	L	70	700	L	15	70	50	N	300
5	241	54	L	50	700	L	15	70	50	L	700
6	240	53	L	30	300	L	10	70	50	N	700
7	232	45	L	50	2,000	L	15	70	300	N	700
8	231	44	L	70	3,000	L	15	70	300	N	700
9	230	43	L	50	700	L	15	70	50	N	500
10	236	49	L	50	700	L	15	70	30	N	700
11	235	48	L	50	700	L	20	100	70	N	500
12	234	47	L	50	700	L	20	100	70	N	500
13	233	46	L	30	700	L	10	50	30	N	700
14	238	51	L	50	700	L	15	100	50	N	700
15	237	50	L	30	700	L	20	150	70	L	700
16	239	52	L	20	700	L	10	100	50	N	700
17	287	101	L	20	300	N	15	200	70	50	700
18	285	99	L	30	200	N	20	300	200	N	1,500
19	286	100	L	50	700	N	15	200	100	N	700
20	288	102	L	50	500	N	20	200	150	N	700
21	289	103	L	50	500	N	20	300	100	N	700
22	290	104	L	100	300	L	15	200	150	N	1,000
23	208	8	L	50	1,000	N	15	150	70	N	500
24	207	7	L	50	700	N	20	150	70	N	500
25	206	6	L	50	2,000	N	20	150	70	L	500
26	205	5	L	30	500	N	15	150	100	N	500
27	204	4	L	50	1,000	L	20	100	70	N	700
28	203	3	L	50	700	L	20	100	70	L	700
29	201	1	L	30	1,000	N	20	150	70	L	700
30	202	2	N	70	500	L	20	100	70	L	500
31	244	57	L	100	3,000	L	15	150	30	70	1,000
32	245	58	0.06	100	1,500	L	15	200	30	70	700
33	246	59	.02	100	1,500	1	15	150	30	50	1,000
34	248	61	.02	150	1,500	L	20	200	30	70	1,000
35	249	62	L	100	1,000	L	15	200	30	50	7,000
36	219	32	L	70	1,000	1	20	100	70	L	700
37	220	33	.06	50	1,000	L	30	150	70	30	700
38	218	31	L	50	1,000	L	30	100	70	N	700
39	216	29	L	70	1,000	L	20	100	100	L	700
40	217	30	N	20	700	N	15	70	50	N	300
41	215	28	.04	50	1,000	L	20	150	100	20	700
42	214	27	L	50	1,000	L	20	150	70	L	700
43	211	24	L	50	1,000	1	20	150	70	L	700
44	212	25	.02	50	1,000	L	30	150	70	L	700
45	213	26	L	70	1,000	1	30	150	100	20	700
46	210	23	L	50	1,000	L	30	100	100	20	700
47	209	22	L (.1)	20	500	1	5	30	30	N	300
48	227	40	L	70	3,000	L	30	150	70	L	700
49	226	39	L (.1)	50	700	L	15	70	50	N	500
50	225	38	L	50	700	L	20	150	50	L	700

absorption. Analyses reported to the nearest number in the series 1, 0.7, 0.5, 0.3, 0.2, 0.15,
than. Semiquantitative spectrographic analyses by K. J. Curry, Arnold Farley, Jr., and C. L.
but not detected: Ag, As, Bi, Cd, Hg, Mo, Pd, Pt, Sb, Sn, Ta, Te, W, and Zn; exceptions: Ag,
sample 105; Mo, 10 ppm in sample 64, 5 ppm in samples 60, 136, 141, and 142; W, 100 ppm in
the limits of determination differ from those indicated at the end of the table, their values

Parts per million--Continued							Percent				
Nb	Ni	Pb	Sr	V	Y	Zr	Mg	Fe	Ca	Ti	Sample
L	30	15	300	100	20	150	1.5	3	2	0.3	1
L	30	10	1,000	70	15	70	.5	1.5	5	.2	2
L	30	15	200	100	15	100	.7	3	1.5	.3	3
L	30	15	150	100	15	100	.5	3	.5	.3	4
L	30	15	700	100	20	150	1.5	5	3	.5	5
L	30	10	300	100	15	100	1	3	3	.5	6
L	30	10	300	100	15	100	1	5	1.5	.5	7
L	30	15	200	100	15	150	.7	5	1	.5	8
L	30	15	300	70	15	100	.3	3	.5	.3	9
10	30	15	500	70	20	100	1.5	3	3	.5	10
L	30	15	500	150	20	150	1.5	5	1.5	.5	11
L	30	15	300	100	15	100	1.5	5	1.5	.5	12
L	30	10	300	70	10	100	.7	3	.7	.3	13
L	30	15	700	70	20	100	1.5	7	3	.3	14
L	30	15	500	100	15	150	1.5	5	3	.5	15
N	30	10	700	100	15	100	1	5	3	.3	16
10	70	10	300	300	15	70	3	10	20	.5	17
10	70	15	300	500	20	70	3	10	7	1.0	18
10	70	10	500	500	20	70	3	10	10	1.0	19
10	70	15	200	500	15	100	3	10	7	1.0	20
10	70	10	500	500	30	100	3	10	10	1.0	21
10	70	30	300	500	15	100	3	10	10	1.0	22
L	50	20	300	100	15	150	1.5	5	1	.3	23
10	50	20	300	150	20	150	1.5	7	2	.7	24
L	70	30	300	100	15	150	1.5	5	.7	.3	25
L	30	15	300	150	15	100	1.5	3	2	.5	26
L	50	20	300	150	20	150	1.5	5	1.5	.5	27
L	50	15	200	150	15	100	1.5	3	1.5	.5	28
L	50	30	200	100	20	150	1.5	3	.7	.3	29
L	30	20	100	100	15	100	1	2	1.5	.3	30
L (20)	50	10	300	150	15	150	1	7	1.5	.3	31
L (20)	50	L	300	100	15	200	1	7	.7	.7	32
L (20)	50	15	200	150	15	150	1	7	1.5	.7	33
L (20)	70	15	150	150	15	200	1.5	7	.7	.5	34
20	50	10	100	150	15	150	1.5	15	.7	.5	35
L	70	30	200	150	30	150	1.5	7	.5	.5	36
L	70	30	300	150	30	150	1.5	7	.7	.5	37
L	70	30	300	150	20	150	1.5	7	.7	.5	38
L	70	30	300	150	20	150	1.5	7	.5	.5	39
L	50	10	200	70	10	70	1	3	.1	.2	40
L	50	30	300	100	30	150	1.5	7	1	.5	41
L	50	20	300	100	15	150	1.5	7	.7	.3	42
L	30	20	200	100	15	150	1.5	5	.5	.3	43
L	70	30	200	150	15	150	1.5	7	.5	.3	44
L	70	30	200	150	20	150	1.5	7	.7	.5	45
L	70	70	200	100	30	150	1	7	.5	.5	46
L	20	30	50	70	15	70	.5	1	.7	.2	47
L	50	20	500	150	20	150	1.5	7	1	.5	48
L	30	20	100	70	15	70	.7	2	.7	.2	49
L	50	20	200	100	20	150	1.5	5	.7	.3	50

Table 2.--Analyses of stream-sediment samples from the

Sample	Lab. No. ACF-	Field No.	Parts per million Au	B	Ba	Be	Co	Cr	Cu	La	Mn
51	222	67ASj35	L	50	700	L	20	70	70	L	700
52	223	36	L (.1)	50	1,000	1	20	70	70	L	700
53	224	37	N	70	1,000	1	15	100	70	N	700
54	221	34	L	50	1,000	L	30	150	70	L	700
55	340	142	L	70	1,000	L	15	150	100	N	700
56	341	143	L	50	2,000	L	20	150	70	L	700
57	342	144	L	70	1,500	L	50	150	100	20	700
58	343	145	L	70	1,000	L	15	150	30	L	700
59	251	64	L	30	200	N	10	150	20	L	300
60	250	63	L	100	100	N	10	100	30	L	500
61	252	65	L	50	100	N	20	300	30	L	500
62	256	67	0.03	70	1,000	L	50	200	30	30	700
63	253	66	.2	20	300	N	15	200	30	20	500
64	376	67AWk65	L	70	700	L	15	150	30	20	700
65	377	66	L	100	700	1	20	150	70	20	1,000
66	255	67ASj68	.06	50	300	N	50	300	100	L	1,500
67	256	69	.03	50	500	L	50	300	70	L	1,500
68	257	70	L	20	200	N	70	300	150	L	1,500
69	259	72	L	70	700	N	70	300	70	L	700
70	258	71	.06	30	300	N	70	300	100	L	1,500
71	260	73	L	30	500	N	10	70	15	L	200
72	261	74	.04	50	700	N	70	150	70	L	1,000
73	378	67AWk67	L	150	1,500	N	50	300	200	20	1,500
74	263	67ASj77	L	20	200	N	20	300	70	N	1,000
75	284	94	L	30	70	N	150	500	300	N	2,000
76	280	88	L	50	100	N	50	200	300	N	1,500
77	279	87	L	100	30	N	50	150	150	N	1,000
78	278	86	.03	100	300	N	70	300	300	N	1,500
79	282	92	L	150	>5,000	L	15	150	300	N	1,500
80	283	93	L	70	150	N	70	300	300	N	2,000
81	281	90	.02	20	700	N	50	70	300	N	2,000
82	379	67AWk68	L	20	50	L	15	200	100	L	1,000
83	380	69	L	70	1,000	N	20	150	300	N	1,500
84	375	58	L	50	70	L	30	300	300	L	1,500
85	339	46	.03	100	1,500	N	30	300	300	N	1,500
86	381	70	9.6	50	500	L	30	150	200	L	1,500
87	382	71	L	70	700	L	30	300	150	20	1,000
88	383	72	L	30	500	N	50	300	300	N	1,500
89	338	45	L	70	100	N	50	300	300	N	1,000
90	374	54	L	200	50	N	50	300	300	20	1,500
91	373	53	L	200	70	N	70	300	150	20	1,500
92	291	67ASj105	L	30	50	L	15	150	150	N	700
93	292	106	L	L	10	N	N	30	15	N	100
94	294	108	L	10	20	N	N	50	20	N	100
95	295	109	L	L	10	N	N	20	15	N	70
96	293	107	L	L	10	N	N	30	30	N	100
97	297	111	L	20	200	N	15	200	100	N	700
98	296	110	L	70	700	L	20	150	100	N	1,000
99	352	154	L (.1)	150	1,000	1.5	20	150	150	20	1,500
100	355	155	L	70	1,000	1	30	150	100	20	1,500
101	308	116	L	100	L	N	30	300	30	N	500
102	309	117	L	100	700	N	30	100	50	30	500
103	299	113	L	50	1,000	L	15	150	100	N	700
104	298	112	L	50	1,000	L	20	100	100	N	700
105	384	67AWk73	.06	150	1,500	1	70	150	200	30	5,000

McCarthy B-4 and B-5 quadrangles, Alaska--Continued

Parts per million--Continued							Percent				
Nb	Ni	Pb	Sr	V	Y	Zr	Mg	Fe	Ca	Ti	Sample
L	50	30	200	150	20	100	1.5	7	0.5	0.3	51
L	70	30	200	150	20	150	1.5	7	.5	.5	52
L	30	30	100	100	15	100	1.5	3	.7	.3	53
L	70	30	300	150	20	150	1.5	7	.7	.5	54
15	70	15	150	200	15	150	1	7	1	.5	55
15	70	20	150	200	20	150	1.5	7	1.5	.5	56
20	70	20	200	300	30	150	1.5	7	1.5	.7	57
15	50	15	150	200	20	150	1	7	1.5	.5	58
N (20)	30	N	500	70	10	70	10	3	>20	.15	59
N (20)	30	N	700	70	10	50	5	5	>20	.15	60
N (20)	70	N	700	150	7	70	2	7	>20	.2	61
L (20)	100	N	700	150	15	150	1	10	10	.7	62
N (20)	30	N	700	100	7	70	1.5	5	>20	.2	63
10	50	10	1,000	200	50	150	1.5	7	3	.7	64
15	70	10	500	300	20	150	1.5	7	.5	1.0	65
L (20)	150	N	500	150	15	100	2	15	20	1.0	66
L (20)	150	N	700	150	10	100	2	10	10	1.0	67
L (20)	150	N	100	150	15	100	2	15	7	1.0	68
20	150	N	700	200	7	200	1.5	15	>1	>1	69
20	150	N	150	200	10	150	1.5	15	>1	>1	70
L (20)	30	N	150	100	7	150	.7	3	.7	.3	71
20	70	N	200	200	15	150	1	7	.3	>1	72
L	100	15	300	300	30	70	3	10	10	1	73
N (20)	100	N	150	100	20	100	3	15	5	.7	74
10	150	L	100	700	30	100	3	10	7	>1	75
10	100	L	300	500	30	150	3	10	7	1	76
10	70	L	100	500	20	70	3	10	5	1	77
15	150	L	200	700	30	150	3	15	7	>1	78
10	100	15	200	700	30	150	3	10	5	1	79
10	150	10	200	700	30	150	3	10	7	>1	80
15	50	15	200	1,000	50	150	3	15	7	>1	81
L	50	L	300	200	20	50	7	5	20	.7	82
15	50	15	200	500	20	200	2	15	3	>1	83
10	100	10	200	500	30	100	3	10	10	1	84
15	70	30	300	700	30	100	2	15	3	>1	85
10	70	15	300	300	30	150	3	10	7	1	86
15	100	15	200	300	30	200	3	10	5	1	87
10	70	15	300	500	20	150	3	15	7	>1	88
15	100	L	200	500	20	100	3	10	7	1	89
L	100	10	150	500	30	150	3	15	10	>1	90
10	100	10	200	500	30	100	3	15	7	>1	91
10	30	L	700	150	10	30	7	7	15	.5	92
N	7	L	700	70	10	L	5	.7	20	.07	93
N	5	L	1,500	70	10	20	2	.5	20	.05	94
N	5	L	700	30	10	L	3	.3	20	.03	95
N	5	L	700	30	10	20	3	.3	20	.03	96
10	50	10	300	500	15	70	3	10	15	1	97
10	70	30	200	300	20	150	1.5	15	1.5	.7	98
15	70	50	200	200	30	150	1.5	10	1.5	.7	99
10	70	30	150	200	20	100	1.5	7	7	.5	100
N (20)	30	N	300	100	5	150	10	5	20	.5	101
N (20)	30	10	300	150	10	150	1	5	3	.5	102
10	50	30	150	300	20	150	2	10	5	.7	103
10	70	50	100	300	30	100	1.5	10	2	.7	104
15	100	70	300	200	30	150	2	15	.7	1.0	105

Table 2.--Analyses of stream-sediment samples from the

Sample	Lab. No. ACF-	Field No.	Parts per million Au	B	Ba	Be	Co	Cr	Cu	La	Mn
106	306	67AMk36	L	10	30	N	15	300	100	N	700
107	307	37	L	70	150	N	N	300	70	N	700
108	305	35	L	10	30	N	15	300	70	N	700
109	304	34	L	L	30	N	10	150	50	N	700
110	302	32	0.02	10	30	N	15	200	70	N	700
111	303	33	L	10	50	N	15	200	70	N	700
112	300	67ASj114	L	50	200	L	15	100	100	N	700
113	301	115	L	70	1,500	L	15	150	100	20	700
114	313	121	L	100	700	N	30	100	50	20	700
115	311	119	.02	70	500	3	30	150	30	L	500
116	312	120	L	100	1,000	N	20	100	30	20	500
117	310	118	L	70	700	N	30	150	50	20	500
118	318	126	L	30	1,000	L	50	150	50	50	1,000
119	317	125	L	50	1,000	N	70	150	70	30	700
120	316	124	L	100	1,500	1	20	150	30	20	500
121	315	123	L	100	1,500	N	50	150	30	30	500
122	319	127	L	50	1,000	N	30	150	50	30	1,000
123	320	128	L (.1)	50	1,000	L	30	150	100	30	700
124	351	153	L	70	1,000	1	30	150	200	20	1,000
125	268	67AWk5	L	100	N	N	70	500	70	N	1,500
126	267	4	L	100	700	N	30	300	70	20	700
127	266	3	.7	L	300	N	50	300	30	N	700
128	264	1	L	70	200	N	50	500	50	N	1,000
129	265	2	L	70	200	N	50	500	150	N	1,000
130	270	8	.05	15	300	N	50	300	30	30	1,000
131	269	7	.7	10	300	N	50	500	30	N	1,000
132	277	18	L	70	700	1	30	100	50	50	1,000
133	271	9	L	70	300	N	30	300	50	50	700
134	274	13	L	70	700	3	30	150	30	50	1,000
135	276	15	L	70	1,000	3	30	150	30	70	700
136	275	14	.03	100	1,000	3	30	150	100	70	1,500
137	272	10	L	70	300	N	30	150	50	50	1,000
138	273	11	.09	50	200	N	50	300	30	50	1,000
139	337	39	L	100	1,000	N	50	150	70	30	100
140	336	38	L	100	1,000	N	30	100	30	30	700
141	335	37	.08	70	700	N	30	150	70	50	1,000
142	334	36	L	100	1,000	N	50	150	30	30	1,000
143	333	35	L	70	1,000	N	70	150	70	50	2,000
144	332	34	L	70	1,000	N	50	150	70	30	2,000
145	331	33	L (.1)	70	1,000	N	50	150	70	30	1,500
146	330	32	L	70	1,000	N	50	150	50	30	1,000
147	329	31	L	30	1,000	N	20	150	30	20	1,000
148	328	30	L	70	1,000	N	50	150	30	30	1,000
149	327	29	L	50	1,000	N	50	150	30	30	1,000
150	326	28	L	50	700	N	50	150	30	20	1,000
151	325	27	L	50	500	1	50	150	30	20	1,000
152	321	23	L	50	1,000	L	50	150	50	30	700
153	322	24	1.5	30	500	L	30	150	30	L	700
154	323	25	L	30	500	N	50	150	30	L	1,000
155	324	26	L	50	500	N	50	150	100	L	1,000
156	348	67ASj150	L	100	1,000	L	20	150	150	L	700
157	349	151	L	100	1,500	L	50	150	150	20	1,000
158	350	152	L	100	1,500	L	20	150	100	20	1,000
159	346	148	L	70	700	L	15	200	70	20	700
160	345	147	L	70	2,000	L	15	150	50	20	700

McCarthy B-4 and B-5 quadrangles, Alaska--Continued

Parts per million--Continued							Percent				
Nb	Ni	Pb	Sr	V	Y	Zr	Mg	Fe	Ca	Ti	Sample
N	50	10	300	300	15	20	5	10	>20	0.5	106
N (20)	100	N	500	150	5	N	10	10	>20	.3	107
N	50	L	300	300	15	10	5	10	20	.5	108
N	30	L	300	150	15	10	5	3	20	.2	109
N	50	L	300	500	15	20	7	10	20	1.0	110
N	50	L	300	200	15	20	5	10	20	.5	111
10	50	30	150	200	20	100	2	10	5	.7	112
10	70	20	150	500	20	70	2	10	.15	.5	113
N (20)	30	30	150	150	10	150	1	5	.7	.5	114
N (20)	30	15	500	150	10	150	1.5	5	2	.5	115
N (20)	30	30	150	100	10	150	1	5	.7	.5	116
N (20)	30	N	300	150	7	150	1	7	5	.7	117
N (20)	50	30	150	150	30	150	1	7	.5	.3	118
N (20)	70	20	200	100	30	150	1.5	7	.7	.3	119
N (20)	30	30	100	100	15	150	1	5	.7	.5	120
N (20)	30	30	200	150	10	150	1	7	.5	.5	121
N (20)	30	20	150	100	20	150	1	7	.7	.3	122
N (20)	30	20	200	100	20	150	1	7	1	.5	123
15	100	70	150	200	30	150	1.5	10	1	.5	124
N (20)	70	N	150	150	10	70	3	15	7	1.0	125
N (20)	70	N	200	100	20	100	2	15	3	1.0	126
N (20)	50	N	700	200	N	100	3	15	5	1.0	127
N (20)	70	N	200	150	15	150	3	15	5	.7	128
N (20)	70	N	150	150	N	100	2	15	5	1.0	129
N (20)	70	N	700	150	15	150	3	10	7	.7	130
N (20)	70	N	500	150	N	150	3	15	7	1.0	131
N (20)	70	N	150	150	15	200	.7	10	.5	.5	132
N (20)	70	20	150	100	20	150	1	10	1	.7	133
30	70	20	150	100	20	200	1	7	3	.5	134
N (20)	70	10	200	150	30	200	.7	10	3	.5	135
30	70	N	150	100	30	200	1	10	2	.7	136
N (20)	70	N	150	100	20	150	1	10	1.5	.5	137
20	70	30	700	100	15	200	3	10	10	.7	138
N (20)	30	30	150	100	15	150	.7	10	.7	.5	139
N (20)	30	30	150	100	15	150	.7	7	.7	.3	140
N (20)	30	N	300	70	10	200	.7	15	1.5	1	141
N (20)	30	N	300	70	20	150	.7	7	.7	.5	142
N (20)	50	20	200	100	20	150	1.0	7	1	.5	143
N (20)	50	20	150	100	20	150	1.0	7	.5	.5	144
N (20)	70	30	200	100	20	150	1.0	7	.7	.5	145
N (20)	50	30	200	70	15	150	.7	7	.5	.3	146
N (20)	30	30	300	70	20	150	1.0	7	1	.5	147
N (20)	50	20	150	100	15	200	1.0	7	.7	.2	148
N (20)	50	20	200	100	20	150	.7	7	.7	.5	149
N (20)	50	20	150	100	15	150	.7	7	.7	.5	150
L (20)	50	20	200	100	15	150	1.0	7	.7	.5	151
N (20)	50	30	150	100	20	150	1.0	7	.7	.5	152
N (20)	50	20	100	100	15	150	.7	5	.7	.3	153
N (20)	30	30	150	100	15	150	.7	7	.7	.3	154
N (20)	50	30	150	100	15	150	.7	7	.7	.3	155
15	70	30	150	200	15	100	1.5	10	1	.5	156
15	70	20	200	300	30	150	1.5	10	1.5	.7	157
10	70	30	200	300	30	150	1.5	7	1.5	.7	158
15	50	20	200	200	20	150	1.5	7	1	.7	159
15	70	15	200	200	20	150	1	7	1	.5	160

Table 2.--Analyses of stream-sediment samples from the

Sample	Lab. No. ACF--	Field No.	Parts per million Au	B	Ba	Be	Co	Cr	Cu	La	Mn
161	347	67ASj149	L	70	5,000	L	100	300	70	L	1,000
162	344	146	L	70	2,000	L	20	150	70	L	700
											Limit of
			0.02	10	5	1	5	5	5	20	10

McCarthy B-4 and B-5 quadrangles, Alaska--Continued

Parts per million--Continued							Percent				
Nb	Ni	Pb	Sr	V	Y	Zr	Mg	Fe	Ca	Ti	Sample
15	100	15	300	300	30	150	1.5	10	1.5	0.7	161
15	50	30	150	200	20	150	1.5	7	1.5	.5	162
determination											
10	2	10	50	10	10	20	0.02	0.05	0.05	0.001	

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