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INVESTIGATION OF THE BAILEY COPPER PROSPECT,
WILLOW CREEK MINING DISTRICT, SOUTH-CENTRAL
ALASKA

by Raymond P. Maloney

***** open-file report

UNITED STATES DEPARTMENT OF THE INTERIOR

Stewart L. Udall, Secretary

BUREAU OF MINES

Walter R. Hibbard, Jr., Director

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Raymond P. Maloney^{1/}

ABSTRACT

This prospect is in the southwest corner of the Talkeetna Mountains about 45 airline miles northeast of Anchorage. Numerous gold mines and gold and molybdenum prospects in the area make it potentially important.

Bornite, chalcopyrite, covellite, molybdenite, gold, and silver occur in a shear zone in quartz diorite. The shear zone appears to be about 200 feet wide and at least 1,500 feet long; glacial debris, rubble, and talus cover most of it; disseminated mineralization can be observed in bedrock exposed over an area about 50 feet wide, 500 feet long, and over a vertical distance of about 300 feet. A drilling program would be necessary to determine the size, grade, and character of the deposit.

INTRODUCTION

A reconnaissance examination was made in September 1963 of the Bailey copper prospect as part of the Bureau's program of mineral investigations. The area has been an important producer of lode gold, and numerous gold and molybdenum prospects have been reported by the Geological Survey. As far as can be ascertained, this prospect has not been examined before by the government.

ACKNOWLEDGMENTS

Acknowledgment is made to Norman Hartung and John Murphy, owners, for general information about this prospect.

LOCATION AND ACCESSIBILITY

The Bailey copper prospect is on Reed Creek in the northeast end of the Willow Creek mining district at latitude 61°50' N and longitude 148°11' W

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(figs. 1, 2, and 3). It is in the Little Susitna River basin, in the southwest corner of the Talkeetna Mountains, 45 airline miles northeast of Anchorage and 20 airline miles north of Palmer.

It is about 20 miles by gravel road from the Glenn Highway at Palmer to within about 2 miles of the Snowbird mine; an unimproved dirt road continues on to the mine and it is about 2-1/2 miles further by trail to the Bailey prospect. The Alaska Railroad and the Glenn Highway link Palmer and Anchorage.

PHYSICAL FEATURES AND CLIMATE

The prospect is in the southwest corner of the Talkeetna Mountains at about 4,500 feet altitude. The area has been glaciated and the topography is one of sharp peaks and ridges with steep slopes. The timberline is about 2,000 feet, vegetation is sparse, and bedrock exposures are numerous.

Palmer weather records from 1941 to 1950 show annual precipitation to be about 15 inches, and daytime temperatures from June to September average about 50° F. The Bailey prospect is over 4,000 feet higher than Palmer, and freezing temperatures could be expected at times every month.

HISTORY AND OWNERSHIP

The number of gold mines and prospects in the Willow Creek district indicates that it has been well prospected. Capps describes a Mogul prospect (1, p. 74)^{2/} in the upper Reed Creek valley that is probably near the Bailey prospect, but from the description given by Capps of the Mogul, it is unlikely that they are the same. The present owners of the Bailey prospect are John Murphy and Norman Hartung, and they have located and recorded one lode claim, the Bailey No. 1. They state that an adit 40 feet long which was driven on this claim carried gold values of over \$40 a ton. It is now caved, covered by slide rock, and inaccessible, but enough evidence remains to indicate that there probably was an adit..

DESCRIPTION OF THE DEPOSIT

General Geology

The following description is based on Geological Survey publications listed in the bibliography. The area has been subjected to intense glaciation and consequently its preglacial gold-bearing gravels have been removed by glacial ice. The area is underlain by intrusive rocks of late Mesozoic

^{2/} Underlined numbers in parentheses refer to items in the bibliography at the end of this report. Page references refer to pages in the items and not to pages in this report.

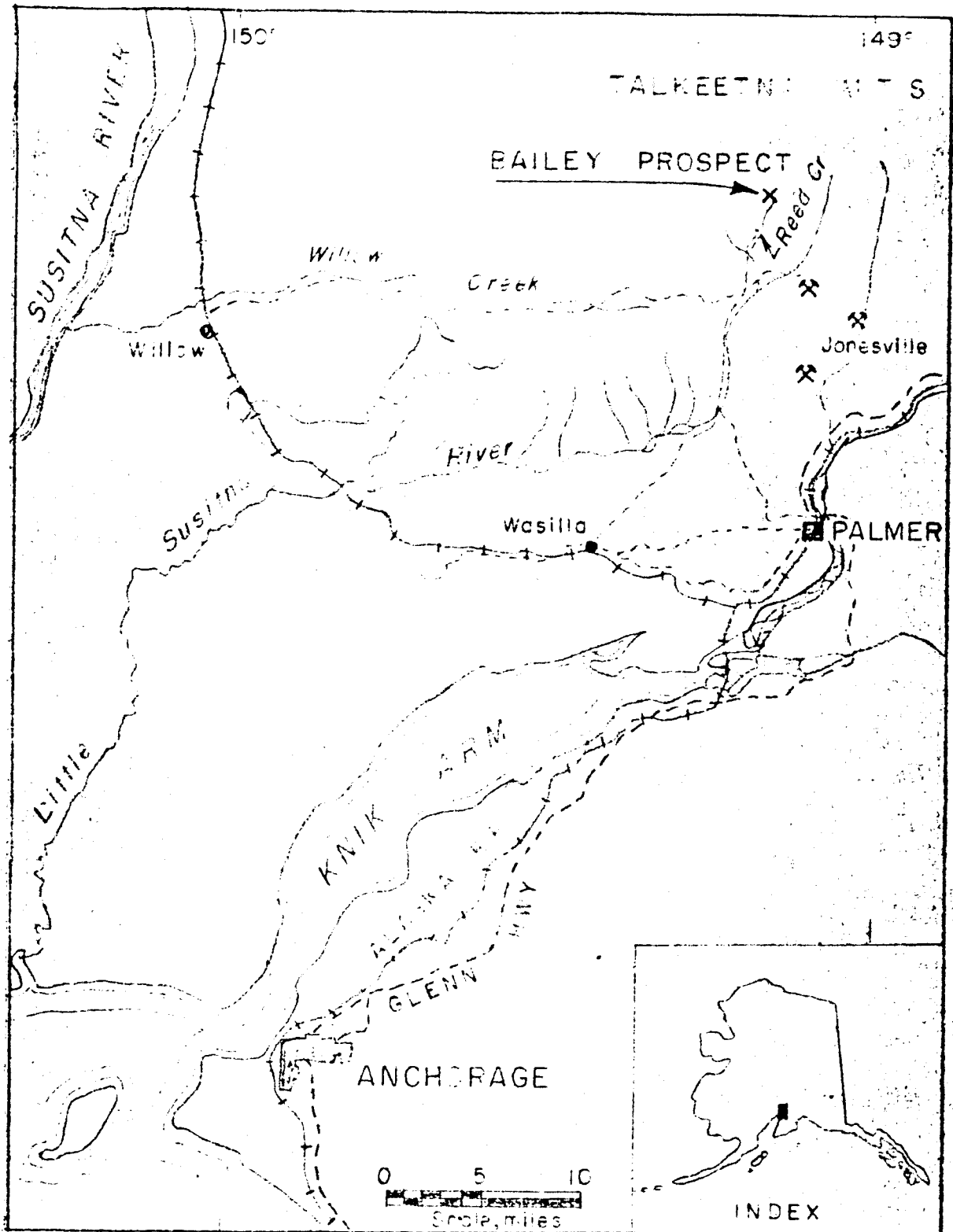


FIGURE I.- Index Map, Bailey Prospect, Alaska.

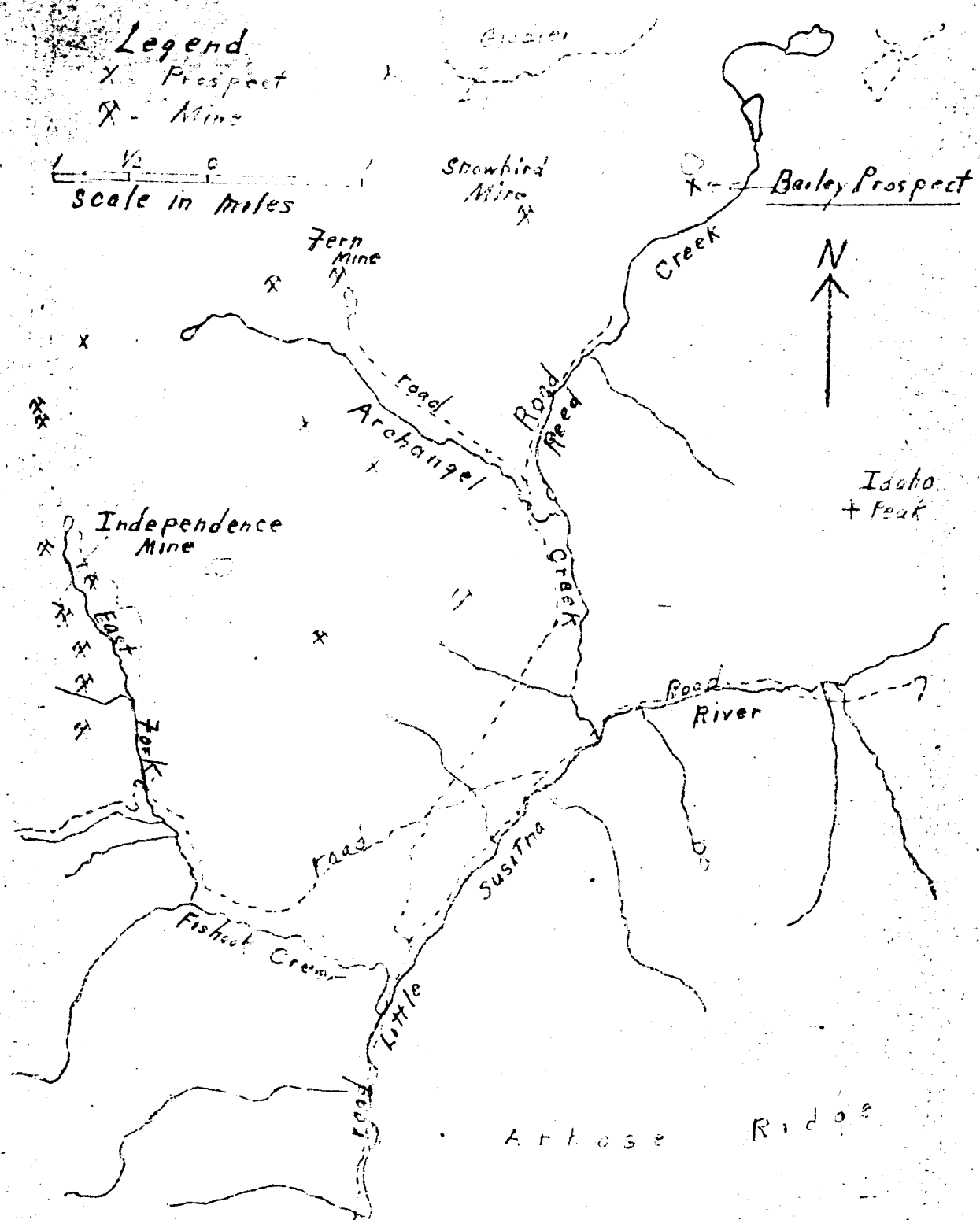
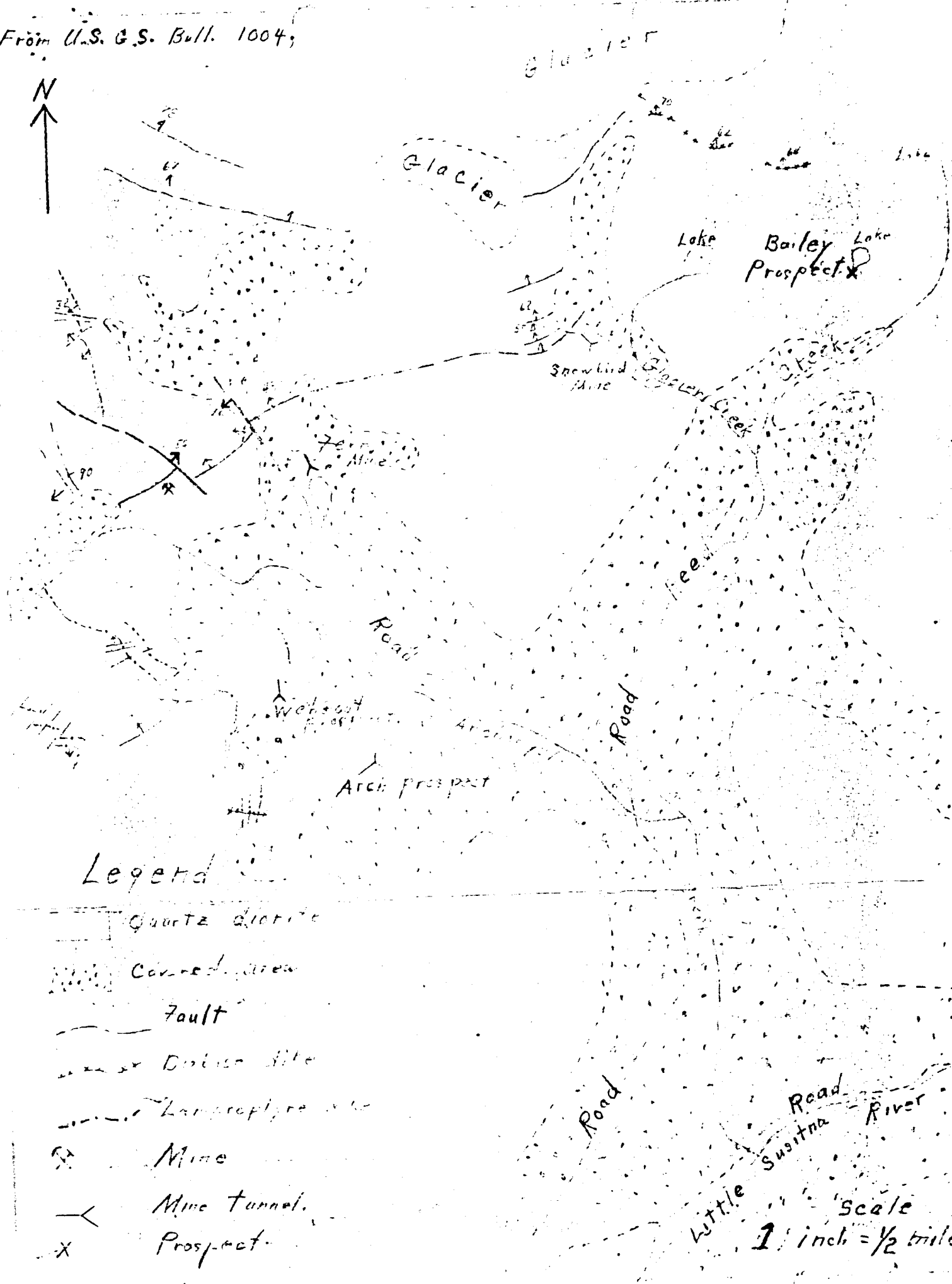
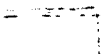
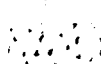
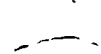
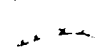
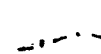





FIGURE 2- Locator Map, Bailey Prospect, Alaska

From U.S. G.S. Bull. 1004;



Legend

-  Quartz diorite
-  Covered area
-  Fault
-  Drain site
-  Land prospect
-  Mine
-  Mine tunnel
-  Prospect

Scale
1 inch = 1/2 mile

age which form the southern margin of the great Talkeetna batholith of south-central Alaska. Quartz diorite is the predominant intrusive with small local masses of gabbro and granite. It is thought that the igneous rocks now exposed are not from the original periphery of the intrusive mass. Dikes of lamprophyre, diabase, aplite, and pegmatite occur in the quartz diorite. Tertiary sediments of sandstone, shale, arkose, and conglomerate occur about 6 miles south of the prospect as do schists of unknown age, but older than the intrusives.

Mineralization usually is associated with quartz veins occurring in shear zones in the quartz diorite. Gold, copper, sulfides, molybdenite, stibnite, pyrite, and arsenopyrite are the chief minerals found.

The Deposit

Mineralization occurs in a shear zone in quartz diorite at about 4,500 feet altitude (fig. 4). This shear zone appears to be about 200 feet wide, at least 1,500 feet long, strikes east and west, and dips approximately 75° to 80° to the north. Granite and granodiorite were also identified in the zone. Bornite, chalcopyrite, covellite, molybdenite, gold, and silver were erratically disseminated in a zone 50 feet wide, 500 feet long, and about 300 feet in vertical depth along the south side and upper or west end of the shear zone. The rest of the shear zone was covered or filled with large boulders, often as much as 6 by 10 feet in size.

Float was not found at the bottom in Reed Creek or elsewhere, but the area has been intensely glaciated and bedrock outcrops are usually at or near the higher peaks and cliffs. Copper stain was seen on a vertical cliff about 4,000 feet north of the prospect. Mineralization was found in about the only section of exposed bedrock in the shear zone which appeared to continue east across Reed Creek for at least 5,000 feet. Mineralization was not seen adjacent to either side of the shear zone.

Assays and spectroscopic analyses of samples are in tables 1 and 2. These are chip samples of the bedrock and float samples of material probably taken from the now caved adit. The molybdenite occurred as small blebs, some as large as one-half inch in diameter and one-quarter inch thick associated with the copper sulfides.

TABLE 1. - Chemical analyses of samples

Sample No.	Description	Percentage		Ounce per ton	
		Cu	Mo	Au	Ag
76	Light gray unaltered diorite with bornite....	7.96	0.03	0.41	0
77	Light gray unaltered diorite with Mo, no copper visible.	.47	1.29	.15	0.53
78	Light gray unaltered diorite with bornite....	7.94	.03	.38	.12
79	Quartz, diorite, minor bornite.....	.71	.03	.10	.18
80	Composite of numerous small samples over area	4.58	2.06	.60	1.81

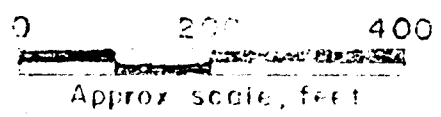
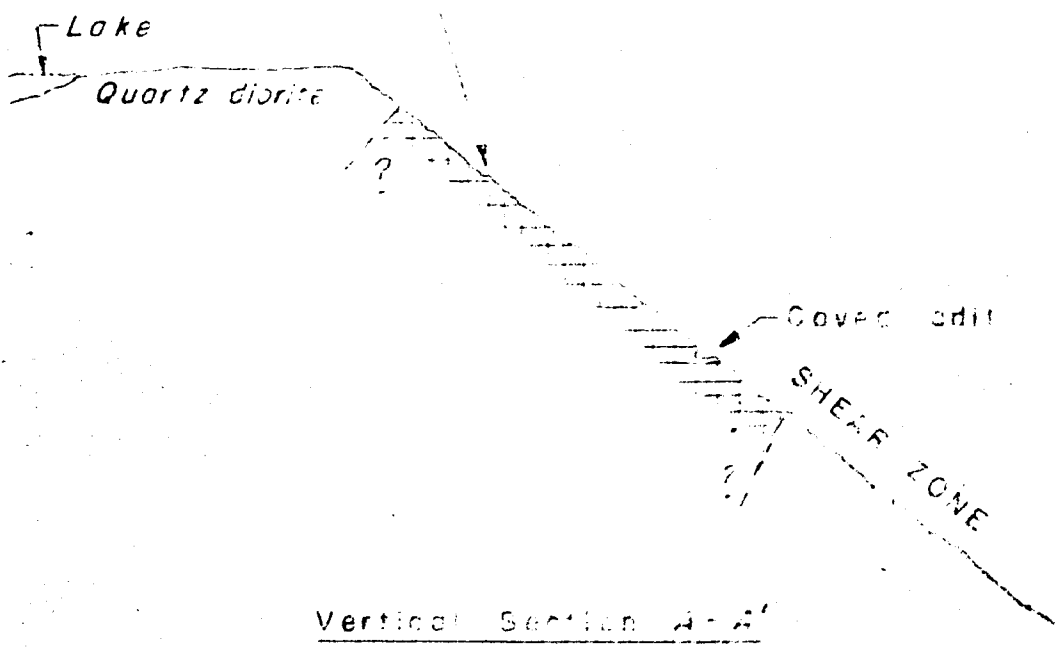
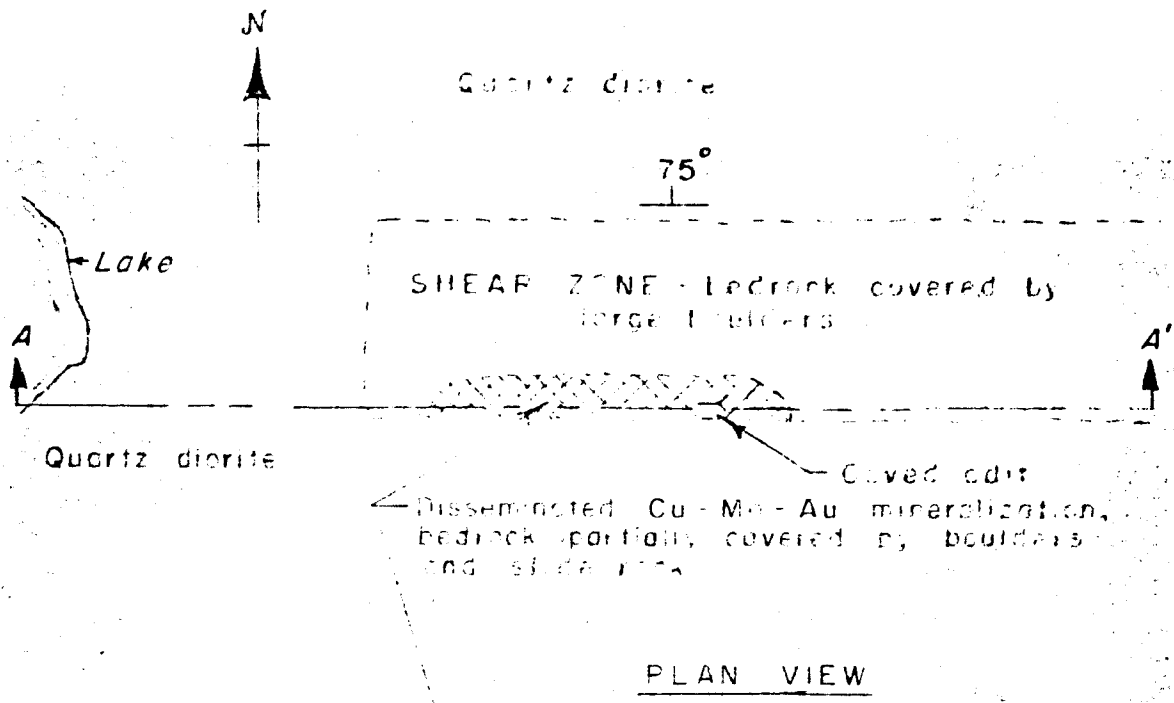


FIGURE 4 - Plan and Section of Bailey Prospect.

TABLE 2. - Spectroscopic and petrographic analyses

Sample No.	73	74	75
Spectroscopic:			
Ag	T	N	N
Bi, Cb, In, Sr, Pb, Y	N	N	N
Cu	X	T	N
Mo	N	X	N
Zn	N	T	T
Petrographic:			
Rocks			
Chlorite schist	-	-	C
Granite	-	-	C
Granodiorite	C	-	-
Quartz-diorite	-	C	-
Minerals			
Andesine	-	A	-
Biotite	-	S	A
Bornite	A	N	N
Chalcopyrite	S	T	N
Chlorite	A	F	A
Covellite	M	-	-
K-feldspar	A	-	A
Molybdenite	-	*M	-
Pyrite	-	T	-
Quartz	P	A	A

* One molybdenite grain with maximum diameter 2.0 cm and thickness 1/4 cm--
no MoS dissemination.

Legend: P - Predominant more than 50 percent C - Rock classification
 A - Abundant 10 - 50 percent X - Detected in sample
 S - Subordinate 2 - 10 percent N - Sought but not
 M - Minor .5 - 2 percent detected.
 F - Few .1 - .5 percent
 T - Trace less than .1 percent

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