MINERAL LAND ASSESSMENT OF YAKOBI ISLAND AND ADJACENT PARTS OF CHICHAGOF ISLAND, SOUTHEASTERN ALASKA

by Arthur L. Kimball, Alaska Field Operations Center, Juneau, Alaska

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James G. Watt, Secretary

BUREAU OF MINES

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MINERAL LAND ASSESSMENT OF YAKOBI ISLAND AND ADJACENT PARTS OF CHICHAGOF ISLAND, SOUTHEASTERN ALASKA

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Arthur L. Kimball[1]

ABSTRACT

The Bureau of Mines examined Yakobi Island and adjacent parts of Chichagof Island in Tongass National Forest, Southeast Alaska, in 1978 and 1979, as one part of the studies mandated by the Wilderness Act (Public Law 88-577). More than 1,800 lode mining claims had been recorded on several types of mineralized zones in the 460 square mile area. Nickel-copper-cobalt magmatic segregations occur in norite in Bohemia Basin on Yakobi Island and at Mirror Harbor on the west coast of Chichagof Island. Reserves of 20 million tons averaging 0.31 percent nickel, 0.18 percent copper, and 0.04 percent cobalt have been announced. Both areas are being explored but the full extent of the mineralized zones remains unknown. Gold-silver-tungsten fissure veins occur on Apex Mountain west of Lisianski Inlet, where the Apex-El Nido Mines produced 17,000 oz. gold before 1940. These veins and similar veins in the surrounding area have some potential for further small scale mining. A partially explored zone containing high grade copper in Goon Dip Greenstone on Mt. Baker north of Goulding Harbor also has some potential for development. Exploration targets with unknown potential are copper associated with the Goon Dip Greenstone elsewhere in the area, fault controlled copper and zinc bearing zones in older amphibolite east of Mine Mtn., copper bearing magnetite skarns near Stag Bay, and gold and uranium in stream sediments from a granodiorite body at Deep Bay.

1/ Physical Scientist, Alaska Field Operations Center, Juneau, Alaska

INTRODUCTION

Purpose and Scope

The Wilderness Act (Public Law 88-577, September 3, 1964) and the Joint Conference Report on Senate Bill 4, 88th Congress, provide that the U.S. Geological Survey and the Bureau of Mines jointly assess the mineral resources and reserves of areas under consideration for wilderness designation as one aspect of the suitability studies. A joint mineral assessment of the 405,000 acre "Western Chichagof - Yakobi Islands wilderness study area" was made in 1978 and 1979. Before the assessments were completed, the 265,000 acre "West Chichagof - Yakobi Wilderness Area" was created within the Western Chichagof - Yakobi Islands wilderness study area by the Alaska National Interest Lands Conservation Act (ANILCA, Public Law 96-487, December 2, 1980). A joint Bureau of Mines/U.S. Geological Survey report (Johnson, Kimball and Still, 1981), briefly summarizes the results of these investigations. This is one of two reports that describe Bureau of Mines investigations and present the results in detail.

The western Chichagof - Yakobi Islands wilderness study area (figure 1) was divided into two sections for Bureau of Mines study and assessment. This report concerns 160,000 acres of the 265,000 acres of new wilderness and nearly all of the remaining 140,000 acres of non-wilderness within the original 405,000 acre wilderness study area. The remaining one-fourth of the study area is covered by Bureau of Mines Open File Report 89-81 "Mineral Land Assessment of the West Portion of Western Chichagof Island, Southeast Alaska". Figure 2 shows the original wilderness study area, the West Chichagof - Yakobi Wilderness Area, the area covered by Open File Report 89-81 and the area covered by this report.

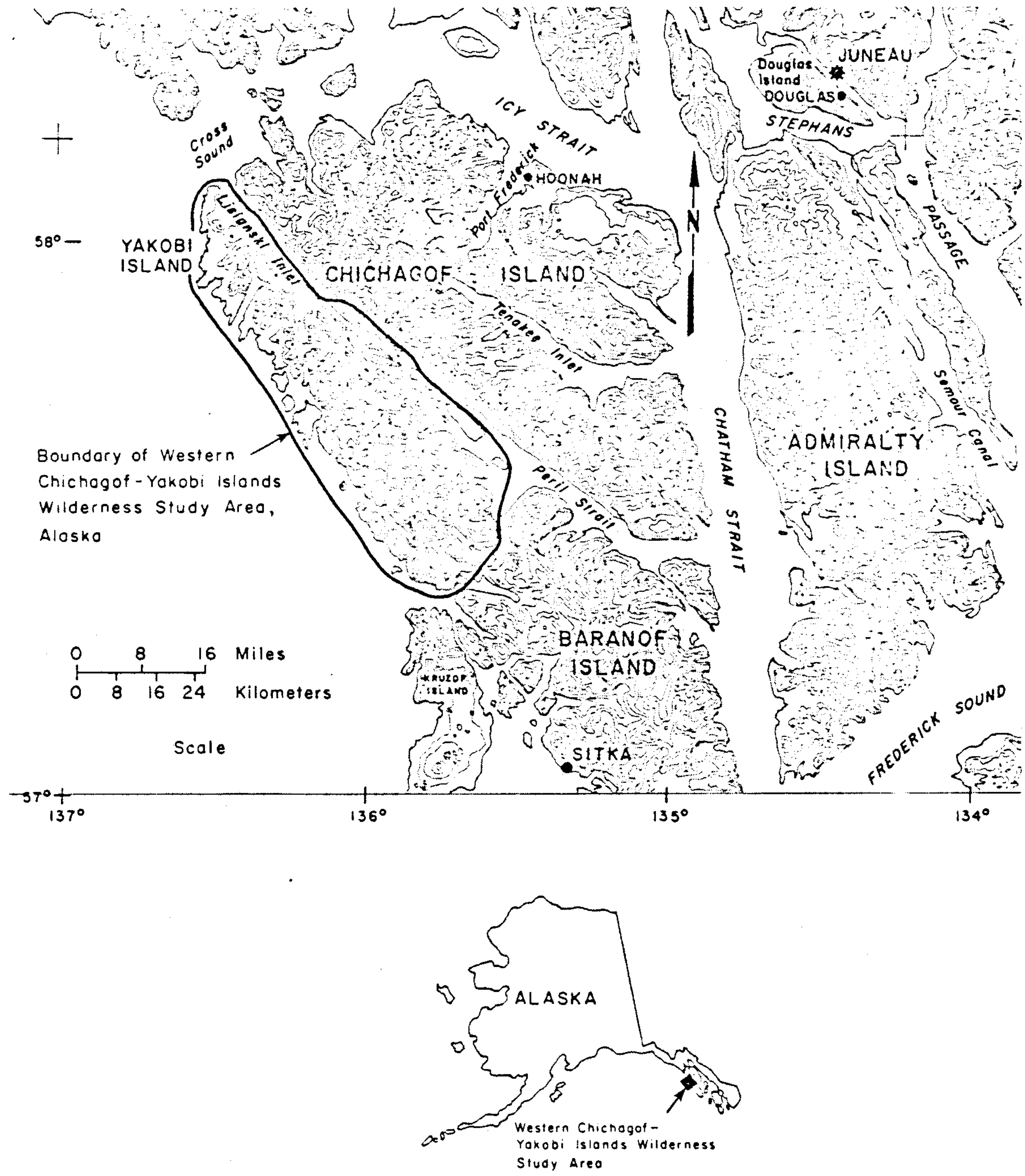

FIGURE 1. - Index map of Chichagof Island and vicinity, showing the Western Chichagof-Yakobi Islands Wilderness Study Area, Alaska

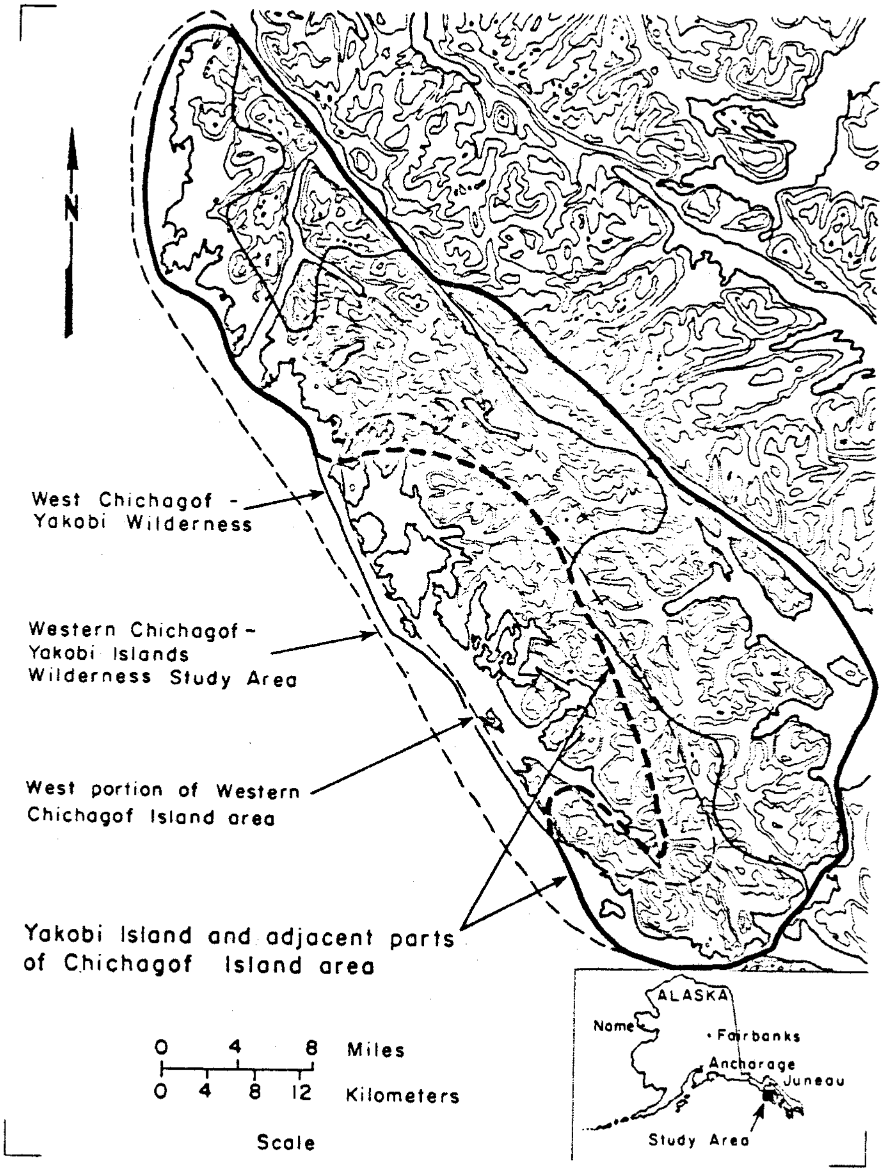

FIGURE 2. - Yakobi Island and adjacent parts of Chichagof Island area within the Western Chichagof-Yakobi Islands Wilderness Study Area

Setting

Yakobi Island and adjacent parts of Chichagof Island form the northwestern corner of Tongass National Forest, Southeast Alaska. Roughly it is an area 60 miles long and 5 to 20 miles wide, that includes more than 450 square miles bounded on the north, south, and east, (except for an 8 mile section), by saltwater fiords and estuaries, and on the west by the Pacific Ocean.

It is an area of moderately rugged mountains with a maximum relief of 3,600 feet. Most of the mountains and ridges that form the high country in the core of the area rise to elevations of 2,500 to 3,000 feet, and have generally rounded, somewhat subdued, glaciated topography. The higher peaks generally are much more rugged and probably have not been glaciated. The high country is characteristically intersected by long through valleys at low elevations which contain rivers and lakes. Most river systems are less than 10 miles long and drain directly into the sea. High country ridges and low valleys are commonly aligned with the northwesterly regional structure. An 8 mile section of lowland between the heads of Lisianski Inlet and Hoonah Sound joins the study area to the main body of Chichagof Island. Except where influenced by these fiords, the coastline of the study area is very irregular and especially so on the west side facing the open ocean.

The climate of the study area is typically maritime. The precipitation is extremely heavy particularly in the northern part where most of the work was done. Weather records kept at Pelican, a small fishing village adjacent to the northern part of the study area, show annual precipitation of 88 to 180 inches during 15 years of record (180.36 inches in

1978 and 154.08 inches in 1979). Annual precipitation at Sitka 70 miles southeast of Pelican and well outside of the study area, is 96 inches. In 1978 and 1979 consistently better weather was found in the southern part of the area. Temperature variations are moderate with record extremes ranging from the high 70's to about 0°F. Freezing temperatures have occurred each of the months from November through May. The average annual temperature at Sitka is 43°F. Cloud and fog frequency are very high; low clouds and fog are typical near sea level throughout much of the year. Snowfall is heavy during winter months and in some localities lasts into late summer. During the 1979 season snow cover prevented the examination of several properties until early August. Precipitation and cloud frequency increase as the summer progresses.

Access to the study area is costly and time consuming. Some of the numerous channels, bays, and inlets provide good anchorages for motor vessels from which many miles of shoreline are accessible by outboard powered skiff. Ridge tops, where rounded and open are accessible by helicopter, as are certain beaches at low tide, and an occasional muskeg area in between. Vegetation is extremely dense between sea level and about 2,000 feet and is dominated by thick spruce and hemlock forest at lower elevations, gradually giving way with increased elevation to alder, willow thickets and low shrubs. Some shoreline sites at tide water and on a dozen or more of the larger fresh water lakes are accessible by small fixed wing aircraft equipped with floats. No landing strips for wheel equipped aircraft are within or near the study area. A three-mile long mine access road has been established on Yakobi Island from the beach to Bohemia Basin. No other roads are in use. On Chichagof Island, several short logging roads in the southern part of the area, and two surface tram routes to former gold mining operations are no longer maintained. Hardly a vestige remains of an eight-mile long wagon road once connecting Lisianski Inlet with Hoonah Sound.

One or two permanent inhabitants live within the study area at Greentop Harbor on Yakobi Island. The fishing village of Pelican of population 220 is across Lisianski Inlet from the area.

Previous Studies

Gold was discovered in the area in about 1887 near the eastern tip of Yakobi Island. Copper was discovered on Mt. Baker on Chichagof Island in 1907 and was found associated with nickel and cobalt at Mirror Harbor in 1911. In 1917, R. M. Overbeck of the U.S. Geological Survey examined these copper bearing occurrences in connection with war minerals investigations of copper and nickel deposits. The resulting report (Overbeck, 1919) is one of the early published reports on mineral deposits of the area. Other U.S. Geological Survey publications which describe mineral deposits, mining and prospecting activity include, but are not limited to the following: Chapin, 1916; Martin, 1919; Brooks, 1922; Buddington, 1925; Buddington and Chapin, 1929; Smith, 1930; Reed and Coats, 1941; Reed and Dorr, 1942; Pecora, 1942; Kennedy and Walton, 1946; Twenhofel and others, 1949; Rossman 1959; Berg and Cobb, 1967; Loney and others, 1963; Loney and others, 1975; and Berg and others, 1981.

Bureau of Mines publications describing detailed examinations of specific mineral deposits in the area include reports on Bohemia Basin (East and others, 1948), Mirror Harbor (Traver, 1948), Apex-El Nido mines (Thorne and others, 1948), and Baker Peak (Thorne, 1960).

Examinations by the Alaska Territorial Department of Mines were made between 1922 and statehood in 1959, and then under the succeeding organization body now named the Alaska Division of Geological and Geophysical Surveys. Examinations resulted in reports by Stewart in 1922 to 1941; Roehm from 1936 to 1953; Laney, 1942; Williams, 1955 and 1960, Asbury, 1964; and Eakins, 1975.

Unpublished reports have also contributed much information toward a better understanding of several of the mineral deposits described herein. Those specifically referenced in the text of this report are available for inspection at the Bureau of Mines library in Juneau and include: Holmes, 1941; Bush and Kenly, 1962; and Moerlein, 1971.

Acknowledgments

The crew of the U.S. Geological Survey R/V Don J. Miller II provided support during the 1978 field season. Many thanks are extended to R.L. Roebeck, Master, E.C. Magalhaes, Senior Engineer and Richard Loso, Seaman. The support of Paul Johnson and E.N. Davis, owner and operator, of the M/V Mowich is gratefully acknowledged as is the support of M.L. and W. Strahm of Pelican, Alaska, who extended aid to the field parties. Helicopter service was capably provided by Temsco Copter pilot Barry Roberts, and Livingston Copters pilots Ed Miller, Jim Jenkins, Walt Greives, Don Nepereny, and Bill Zeman. Consultant George A. Moerlein supplied a report on the Mt. Baker copper prospect. Information on mineral deposits of the area was furnished by various people having local knowledge including John Breseman, John and Ned Brockway, D.E. MacDonald, Pat Barrett, Mike Gallagher, Floyd Branson, Vance Thornsberry, Dick Jirik, and Bob DeArmond.

The Field Services Section of the U.S. Geological Survey, Branch of Exploration Research analyzed most of the 1978 and 1979 Bureau of Mines wilderness samples from the Chichagof - Yakobi area at no extra charge

to the Bureau of Mines, as they have done nearly every year since the cooperative program of wilderness studies began in Alaska in 1972. They provided rapid turn-around for special sample suites and made concessions to run a larger than usual number of Bureau of Mines samples in 1979. Analytical support was provided by the following U.S. Geological Survey Branch of Exploration Research personnel: J.C. Hoffman, G.W. Day, C. Forn, U.C. Lucus and F.N. Ward.

Samples were prepared at the Bureau of Mines facility in Juneau by Dave King, petrographic studies were made by W.L. Gnagy, W. Roberts, and J. Zamudio. Samples were fire-assayed by C.W. Merrill, Jr. and K. Weir. Additional analyses were run by the Bureau of Mines Reno Research Center, Skyline Labs, Wheatridge, CO, and Barringer Research, Inc., Wheatridge, CO. Jeanne L. Rataj, Geologist, Alaska Field Operations Center until May 1980 participated substantially throughout prefield and field studies, and also assembled most of the tables and illustrations for this report.

A mine simulation study of the Apex mine was made by R. David Carnes, Alaska Field Operations Center.

Present Studies

Present studies embrace prefield research of known data, on-site collection of new data and synthesis of both into a report.

Field targets were initially identified through pre-field claim records and literature search; contact with exploration companies, consultants and prospectors; interchange with the U.S. Geological Survey regarding local and regional geology; identification of geochemically anomalous areas; and study of aerial photography. Priorities changed as new information from these and other sources including the field studies became available progressively throughout the course of the project. Some targets were identified only as this report was being written.

During field studies, claims, prospects, mines, workings, stained zones and geochemically anomalous localities were examined. Many of these sites were mapped and sampled in detail. Possible extensions of mineralized zones and structures, and potential source areas of certain anomalous geochemical samples were also investigated.

Field examinations were made during June, July and August of 1978 and 1979, and September 1979 by J.L. Rataj and A.L. Kimball, who were joined for one month by T.L. Pittman, for a total of 8 man-months of field study. About 15 percent of this work was based on the U.S. Geological research vessel Don J. Miller II and about 12 percent on the chartered motor vessel Mowich. The remainder of the work was conducted from field camps on Yakobi Island. The field studies were helicopter supported thoughout, however, outboard motor powered skiffs provided access to some localities that could only be reached by water. Nearly 35 percent of the field work was conducted in close cooperation with the U.S. Geological Survey team from the Don J. Miller and jointly operated shore based camps.

Post field work consisted of synthesizing information generated during this study with that from the other sources into this report and a Bureau of Mines/U.S. Geological Survey summary report under U.S. Geological Survey cover.

Sampling

Sample Types

About 500 representative rock samples were obtained from veins, mineralized zones, mineral-stained areas and anomalous sample sites on the surface, in open cuts and in underground workings. Representative samples were of four types: 1) channel sample -- moiled across a measured width; 2) chip sample -- uniform-sized chips taken continuously along a measured line; 3) spaced-chip sample -- chip samples taken at a uniform interval along a measured line; and 4) composite grab sample -- random or select fragments composited from small estimated or measured areas. Grab samples composed of single rock fragments, usually float, were sometimes collected as well.

Petrographic specimens were obtained from many of the sample sites to establish rock type and mineralogy. About 230 stream sediment samples and 75 water samples were collected to serve as geochemical indicators at or near specific sites for back-up or verification of previously obtained anomalous samples and to follow leads toward potential source areas of such anomalous samples.

Sample Tables and Analyses

Samples were analyzed by the U.S. Geological Survey (82 percent of the samples), Skyline Labs, Inc., and Barringer Research, Inc. Method of analysis, elements sought and the lower limit of detection are given in table 1. In addition, Bureau of Mines laboratories in Reno and Juneau provided analyses for gold and silver by fire assay and for tungsten by X-ray spectrometric and colorimetric analysis. The lower limit of quantitative measurability for fire assay analysis at Juneau is 0.0005 oz. gold per ton and 0.1 oz. silver per ton. Amounts down to a quarter or a half of these values can be detected, but not measured, and are reported as a trace. In some instances about half of these amounts can be estimated on a reasonable basis. Lower limits of detection for tungsten are 0.01 percent for X-ray spectrometric and 5 ppm for colorimetric analysis.

Spectrographic analysis normally requires 10 milligrams of sample, while atomic absorption normally requires 10 grams but may use 5 grams with a correspondingly higher detection limit. Fire assay uses an assay-ton or nearly 30 grams of sample and is considered the most reliable of the three methods for gold and silver determinations. Gold and silver values provided by fire assay are expressed in ounces per ton for rock samples, and in ounces per cubic yard for pan concentrate samples where the original volume of the sample is known. Atomic absorption values for gold and silver are expressed in parts per million. Table 2 gives the relationship between parts per million, percent, and ounces per ton.

Tables of analytical results that accompany individual prospect descriptions in the text report sample values for the elements considered important for the particular type of deposit sampled. Symbols used in the tables are defined as follows:

G	Greater than value shown
H	Interference
-	Not looked for
N	Not detected at limit of detection
L	Detected but below limit of determination (Tr for fire assay analysis)
INS	Indicates insufficient sample for analysis

Most of the Bureau of Mines samples from the area were analyzed by the U.S. Geological Survey by atomic absorption and semi-quantitative spectrographic analysis for the elements listed in table 1. Samples were analyzed in their mobile laboratory based temporarily during the 1978 and 1979 field seasons at the Bureau of Mines facility in Juneau. The analytical procedures are designed to provide rapid analyses of large numbers of field samples and to minimize sample turn-around time so as to provide analyses to field parties while they were still in the field area.

TABLE 1. Analytical detection limits

U.S. Geological Survey Branch of Exploration Research Analyses

1. Thirty-one element Semiquantitative Spectrographic Analysis

Element	Detection limit, %	Element	Detection limit,ppm	Element	Detection limit,ppm
Fe	0.05	Mn	10	Mo	5
Mg	.02	Ag	0.5	Nb	20
Ca	.05	As	200	Ni	5
Ti	.002	Au	10	Pb	10
		B	10	Sb	100
		Ba	20	Sc	5
		Be	1	Sn	10
		Bi	10	Sr	100
		Cd	20	V	10
		Co	5	W	50
		Cr	10	Y	10
		Cu	5	Zn	200
		La	20	Zr	10
				Th	100

2. Atomic Absorption analysis

Element	Detection limit,ppm	Element	Detection limit,ppm
Cu	5	Zn	5
Pb	5	Au	0.05 (may be higher for samples weighing less than 10 grams)

Skyline Labs, Inc. Analyses

1. Thirty-one element Semiquantitative Spectrographic analysis

Element	Detection limit,ppm	Element	Detection limit,ppm	Element	Detection limit,ppm
Ca	200	Cr	10	Sb	100
Fe	500	Cu	2	Sc	10
Mg	200	Ga	10	Sr	100
Ag	1	Ge	20	Sn	10
As	500	La	20	Ti	20
B	10	Mn	10	V	10
Ba	10	Mo	2	W	50
Be	2	Ni	5	Y	10
Bi	10	Nb	20	Zn	200
Cd	50	Pb	10	Zr	20
Co	5				

TABLE 1 (continued)

2. Fluorimetric analysis of water sample for U, detection limit of 0.5 ppb.

Barringer Research, Inc. analyses

1. Twenty-three element argon plasma emission spectrometry

Oxide	Detection limit, %	Element	Detection limit, ppm	Element	Detection limit, ppm
TiO_2	0.001	Cu	0.5	Sr	1
Al_2O_3	.01	Pb	15	Th	5
MnO	.001	Zn	2	Mo	20
CaO	.01	Ni	2		
Na_2O	.02	Co	5		
K_2O	.02	Cd	5		
P_2O_5	.02	Be	.1		
MgO	.01	Cr	5		
Total Fe	.01	Ag	3		
(expressed as Fe_2O_3)		V	1		

2. Fluorimetric analysis with solvent extraction for U

Sample type	Acid leach	Detection limit, ppm
Rock	hydrofluoric-perchloric-nitric	0.2
Stream sediment	nitric	.2

3. Atomic absorption

Element	Detection limit, ppm	Element	Detection limit, ppm
Cu	1	Mo	1
Pb	1	Au	0.02
Zn	1		

2. Colorimetric analysis for W, detection limit of 4ppm; for WO_3, 5 ppm

TABLE 2. - Conversion Between Parts Per Million (ppm), Percent (%), and Ounces Per Ton (Oz./ton).

(Ounces per ton = Ounces Troy per 2000lb. short ton)

[1 ppm = 0.0001% = 0.0291667 oz./ton
1 % = 10,000 ppm = 291.667 oz./ton
1 oz./ton = 34.3 ppm = 0.00343 %
1 lb. avoirdupois = 14.583 ounces troy]

PPM	(to)	Percent	(to)	Oz./Ton
0.01		0.0000001		0.0003
.02		.0000002		.0005
.05		.0000005		.0015
.10		.00001		.003
.20		.00002		.006
.30		.00003		.009
.40		.00004		.012
.50		.00005		.015
.60		.00006		.017
.70		.00007		.020
.80		.00008		.023
.90		.00009		.026
1.0		.0001		.029
10.0		.001		.292
20.0		.002		.583
50.0		.005		1.458
100.0		.01		2.917
500.0		.05		14.583
1,000.0		.10		29.167
10,000.0		1.00		291.667

Oz./Ton	(to)	Percent	(to)	PPM
0.01		0.00003		0.3
.02		.00007		.7
.05		.00017		1.7
.10		.00034		3.4
.20		.00069		6.9
.30		.00103		10.3
.40		.00137		13.7
.50		.00171		17.1
.60		.00206		20.6
.70		.00240		24.0
.80		.00274		27.4
.90		.00309		30.9
1.0		.00343		34.3
10.0		.03429		342.9
20.0		.06857		685.7
50.0		.17143		1,714.0
100.0		.34286		3,429.0
500.0		1.71		17,143.0
1,000.0		3.43		34,286.0
10,000.0		34.29		342,857.0

The rapid methods are not intended for the analysis of samples for precise detailed mine valuation, however, they served well in providing much of the analytical support needed for this study.

Mining Claims

A search was made of the Sitka Recording District office whose records date back to 1890. Certificates of location and any affidavits of annual assessment work for all recorded claims in the study area were examined.

More than 1,800 lode claims and 4 placer claims have been recorded in the study area. Of this number, 9 lode claims have been patented and 466 lode and 3 placer claims were active in 1979.

Courthouse records show more claims than were actually found in the field. Claim locations sometimes referenced a mountain or bay with a local name that has not been preserved. Monuments or possible workings on the old claims may have been obliterated. Many claims are relocations of formerly held ground. The distribution of claims within the study area is shown on plate 1. The staking history of selected prospects and mines is given in the Appendix, which also lists groups of claims active in 1979.

Exploration Activity

Gold was discovered in about 1887 near the east end of Yakobi Island. Apex and El Nido gold veins, discovered on Chichagof Island in 1919 and 1920 respectively, produced about 17,000 ounces of gold and 2,400 ounces of silver before 1940. Small quantities of gold are reported to have come from three other properties, the Bon Tara, Goldwin, and Cobol prospects. About 18,000 ounces of gold are thought to have come from the area. These prospects are shown on plate 1.

The copper-nickel-cobalt occurrences at Mirror Harbor were discovered in 1911 and a 175 foot shaft was sunk in 1915. By 1919 the Bohemia Basin occurrences were known and the first claim was staked in 1920. During World War II the Strategic Minerals Program was responsible for examining the Bohemia Basin occurrences and diamond drilling about 5,000 feet of drill holes. During the 1950's International Nickel Company explored the property with 16,000 feet of diamond drill holes. From 1972 until the present, Inspiration Development Company completed 29,000 feet of diamond drilling and has announced an ore reserve of at least 20 million tons of nickel-copper-cobalt ore in measured and inferred catagories.

GEOLOGY

Geologic Setting

The study area is underlain by sedimentary and metamorphic rocks having dominant northwest structural alignment (plate 2). The rocks are successively younger southwestward. A major tectonic boundary, the Border Range Fault extends through the core of the study area on the same structural trend and divides these rocks into two diverse terranes. Triassic greenstone and marble on the east side (Wrangellia Terrane) of the fault, and older Mesozoic and Paleozoic(?) metamorphic rocks farther east have been extensively intruded by foliated Cretaceous and Jurassic diorite bodies having strong northwesterly elongation and alignment. Mesozoic intrusive rocks do not occur west of the fault. Westward of the fault highly deformed upper Jurassic and Cretaceous metasedimentary and metamorphic rocks (Chugach Terrane) give way to younger less deformed and metamorphosed Cretaceous sedimentary rocks. Tertiary(?) intrusive bodies of diorite to gabbro in composition are distributed throughout the area and post date the Border Range Fault movement. Topography has been strongly influenced by Pleistocene glaciation which helped shape all but the highest peaks.

The oldest rocks in the study area, in its easten part, are Mesozoic and Paleozoic(?) metasediments, metavolcanics, and metamorphics, and include hornfels, schists, gneiss, marble, amphibolite, and greenstone. Just west of these rocks are Triassic(?) Goon Dip Greenstone and younger conformable Triassic(?) Whitestripe Marble. The latter is the youngest of the layered rocks in the eastern part of the area and is situated immediately east of the Border Range Fault. The terrane west of the Border Range Fault is composed of Mesozoic rocks of the Kelp Bay and Sitka

Graywacke groups of upper Jurassic to upper Cretaeous age. The first group consists of a complex assemblage of metasedimentary and metavolcanic rocks including greenschist, phyllite, greenstone, marble, chert, graywacke, metatuff, and argillite which are highly deformed and which are described as a melange of chaotic fault bound blocks. The second, the Sitka Graywacke, consisting of sandstone, siltstone, mudstone turbidite, and massive graywacke, is weakly metamorphosed and is classed as flysch.

The two terranes separated by the Border Range Fault had entirely different geologic histories until mid-Cretaceous time when they came in contact with one another via the Border Range Fault. This fault is considered to be a major tectonic boundary constituting a continental plate margin subduction zone.

Jurassic and Cretaceous dioritic rocks have extensively intruded the layered rocks east of the fault. They do not occur west of the fault. They dominate the terrain east of the Goon Dip Greenstone especially along the eastern margin of the study area and are bounded by the Peril Strait Fault on the east. Tertiary(?) intrusive bodies are less extensive, but more widespread, and are distributed throughout the study area. They occur in the terranes on both sides of the Border Range Fault and straddle the fault as well. The largest Tertiary(?) plutons occur at the south end of the study area and in the northwestern part, on Yakobi Island.

The foregoing geologic setting has been drawn largely from the following sources of information: Rossman, 1959; Loney and others, 1975; Plafker and others, 1976; Berg and others, 1978; Johnson and Karl, 1981;

and Karl and others, 1981. The following mineral deposit geology section largely reflects observations made during the present study by the Bureau of Mines in combination with information from the reports cited above and from the property owners.

Mineral Deposit Geology

The Border Range Fault separates two diverse mineral terranes. Nickel-copper-cobalt deposits occur as magmatic segregations in Tertiary(?) gabbro-norite which has intruded the melange west of the fault. Still and Weir (1981) describe gold-quartz vein deposits in sedimentary rocks also west of the fault. East of the fault gold-quartz veins strike northeast in diorite and adjacent metamorphic rocks. These veins strike normal to the regional structural grain while those west of the fault strike with the grain. Copper deposits east of the fault, to the extent they are known, often have fault and stratigraphic control and usually occur in or near greenstone or older metamorphic rocks. One small(?) high grade fault controlled copper deposit occurs in greenstone near a marble contact. Another copper deposit with high zinc values consists of a selectively mineralized fault crossing high grade metamorphic rocks between large diorite plutons. Copper occurs elsewhere in the greenstone mostly in normal geochemical amounts, however, copper bearing float and field geochemistry indicate that other copper deposits which have not been identified may occur in or near the greenstone. Nickel is not known to be associated with the copper deposits east of the fault. Geochemically anomalous gold and uranium occur in a small drainage area in Tertiary(?) granodiorite east of the fault. The nature of these occurrences is not known.

Gold deposits within the area studied consist of gold bearing quartz veins except possibly at Deep Bay, where the mode of occurrence is not yet known. Virtually all known gold-bearing quartz veins within the area are fault controlled, strike northeast, and occur in intrusive igneous and adjacent metamorphic rocks, whereas those west of the area studied near the coast, tend to strike northwest and occur in sedimentary (graywacke) rocks. Dips are steep to vertical in both areas.

Gold-quartz veins occur in Jurassic and Cretaceous diorite at the El Nido mine and in the amphibolite of a roof pendant in diorite of the same age at the Apex Mine. The Bon Tara and Goldwin prospects are also situated in the same diorite, as was the mined section of the Cobol vein. The unmined portions of the Cobol vein are in Mesozoic (or older) greenstone, which also hosts the veins at the Koby prospect. Gold occurs at Deep Bay in trace amounts in Tertiary granodiorite and in significant quantities in stream sediments of the local drainage. There the most visible features with which gold might be associated are pegmatite and aplite dikes on the mountain above the anomalous gold samples. The dikes strike northeasterly and dip steeply in attitudes similar to the gold-quartz veins in the Mesozoic diorite.

Except for the occurrence at Deep Bay all of the known gold bearing deposits occur in the eastern part of the northern half of the area.

The most persistent gold bearing vein structures occur at the Apex and El Nido Mines. Although the vein sections mined at the Apex were in amphibolite, the same or other veins occur along strike in the diorite. Potential for gold reserves appears to be greater near these mines than elsewhere in the area studied.

Tertiary(?) gabbro-norite bodies host nickel-copper-cobalt deposits at Bohemia Basin and at Mirror Harbor. They occur with other Tertiary(?) plutonic rocks largely of dioritic composition, which have intruded the melange of Cretaceous sediments, and Cretaceous and Jurassic metasediments and metavolcanics. They come in contact with the dioritic rocks of Cretaceous and Jurassic age on the east.

The deposits are considered magmatic segregations of sulfide minerals in the igneous rocks having scattered to massive sulfide mineral distribution. Similar host rocks occur elsewhere in the study area, mainly on the western part of Yakobi Island, however no significant concentrations of nickel-copper sulfides have been found except in or near the two areas noted.

Copper occurs in several geologic settings other than in association with nickel in the Tertiary(?) gabbro-norite bodies. Triassic(?) greenstone volcanic rocks host a small(?), but high grade copper bearing zone on Mt. Baker having fault and stratigraphic control. Strong similarities in lithology and stratigraphy of the Triassic(?) Goon Dip Greenstone and Whitestripe Marble with the Nikolai Greenstone and Chitistone Limestone in the Wrangell Mountains is suggested (Plafker and others, 1976), however no indicators of the Kennecott type of deposits were recognized on Chichagof Island. Goon Dip Greenstone hosts widely distributed trace amounts of copper over its many square miles within the study area.

Copper and zinc sulfides occur in selective horizons in Mesozoic and Paleozoic(?) amphibolite and other metamorphic rocks on a prominent fault at the Cable Prospect east of Mine Mountain. Chalcopyrite with magnetite occurs in Tertiary(?) diorite in a fault contact skarn zone between the diorite and Triassic(?) greenstone which is reported to contain minor limestone lenses south of Stag Bay. Copper minerals are also present in small shear zones in Cretaceous graywacke on the west coast at the Slim and Jim prospect and in Canoe Pass.

Geochemically anomalous copper has been reported elsewhere, however the metal sources have not been isolated or sufficiently well defined to permit the type of occurrence or the precise geologic setting to be determined during this study. One large area south of Patterson Bay (more than 25 square miles) underlain by Cretaceous and Jurassic granodiorite, but also containing a wide variety of other rocks, may have some potential for copper deposits. Metamorphic rocks on Moser Island of Mesozoic and Paleozoic(?) age presented similar geochemical anomalies however; although looked for during this study, no specific source was found.

Pegmatite dikes are considered as a possible source of uranium found in stream sediments and water from the base of a mountain of Tertiary(?) granodiorite cut by numerous pegmatite dikes at Deep Bay. Brief reconnaissance of the pegmatites did not, however, reveal the presence of uranium either by surface radiometric surveys or by analysis of reconnaissance samples, nor was the potential source of significant gold, detected in local stream sediments, revealed.

MINERAL DEPOSITS

Gold Occurrences[2/]

Most of 18,000 ounces of gold produced in the area came from the Apex and El Nido gold mines. Minor production is also reported from the Bon Tara, Goldwin, and the Cobol property on Mine Mountain. These and nearly all of the other known gold occurrences within the study area are grouped in the northeastern part, west of Lisianski Inlet, here-in called the Lisianski gold area (plate 1).

Occurrences having surface or underground workings, or other evidence of mining or of exploratory activity, and/or having had reported production are discussed under individual headings using the current property name in the text to identify the property on plate 1. Isolated sample sites are shown in the figures cited.

Apex - El Nido Mines

Introduction and History

The Apex and El Nido gold mines are situated on northwestern Chichagof Island west of Lisianski Inlet opposite the city of Pelican (Plate 1). Gold bearing quartz veins exposed in the walls of a large cirque near the head of Cann Creek on the northeastern slope of Apex Mountain, were mined. The configuration of the underground workings is shown on Plate 3, and includes the 4 levels of the Apex mine and the 2 of the El Nido mine. The mines are about 2,000 feet apart. They are not connected

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2/ Properties are indexed to tables and illustrations in Table 3.

TABLE 3. - Correlation of Occurrence with Plate, Figure, Table, and Text.

Name of Occurrence	Commodity	Plate	Figure	Table	Text Page
Apex Mine	Au, Ag, W	1,3,5,6		6,7,8,10 11	24
Basin Body	Ni, Cu, Co	1,8	10,11		78
Bohemia Basin	Ni, Cu, Co	1,8	10,11		78
Bon Tara prospect	Au, Ag	1	3,4	12,13	46
Brenda vein	Au(?)	1	8	18	67
Cable prospect	Cu, Zn	1	23,24	34	126
Canoe Pass	Cu		27		144
Cobol mine	Au, Ag	1,7	6	16	58
Copper in greenstone	Cu (Also see Mt. Baker prospect)	11	20,22	29,30,31, 33	90,113
Deep Bay	Au, U	1	31		76
El Nido mine	Au, Ag, W	1,3,4		4,5,9,10, 11	24
Falls claims	Cu(?)	1	21	32	114
Flapjack body	Ni, Cu, Co	8	10		81
Fleming Island	Ni, Cu, Co		12		84
Goldwin prospect	Au, Ag	1	5	14	53

TABLE 3. - Correlation of Occurrence with Plate, Figure, Table, and Text. (cont.)

Name of Occurrence	Commodity	Plate	Figure	Table	Text Page
Koby prospect	Ag, Au, Bi	1		15	54
Lost Cove	Ni, Cu	1	13	21	87
Lucky Devil claims	(See Mt. Baker prospect)				
Miner Island	Au				46
Mirror Harbor	Ni, Cu, Co	1	12		84
Moser Island	Cu (?)	1	29	38	144
Mt. Baker prospect	Cu	1,9,10	14,15,16, 17,18,19	22,23,24, 25,26,27 28	90
Mt. Fritz-Mt. Crowther	Cu	1	19	28	109
Ophir claims	Cu(?)	1		39	145
Pat claims	Cu(?)	1	22	33	114
Ram claims	Cu(?)	1	20	31	114
Sea Level prospect	(See Mirror Harbor prospect)				
Slim and Jim prospect	Cu	1	27,28	37	140
Squid Bay	Ni, Cu	1	13	21	87
Stag Bay	Au		7	17,19	67

TABLE 3. - Correlation of Occurrence with Plate, Figure, Table, and Text. (cont.)

Name of Occurrence	Commodity	Plate	Figure	Table	Text Page
Stag Bay copper prospect	Cu	1	25	35	133
Stag Bay gold prospect	Au, Ag	1	7	17	67
Stag Bay magnitite prospect	Fe	1	26	36	137
Stranger River placer	Au	1	9	20	72
Takanis body	Ni, Cu, Co	1,8	10		81
Uranium	U Au		30,31	40,41	145
Ushk claims	Cu (?)	1	20	30	114

underground. Aerial trams once connected both mines with a mill downstream on Cann Creek.

Both properties were originally discovered and located by John H. Cann and were controlled by the Cann family from 1919-1920 until the death of Mrs. Jenny Cann about 1953. The Apex property was relocated by Clell Hodson in 1954 and the El Nido mine by Joe Ott the same year. Later Joe Ott controlled both properties. The Apex and El Nido mines have been held by Apex-El Nido Gold Mines since 1968 listing a Juneau address with BLM. Forty-three unpatented lode and 3 placer claims were held in 1979.

The Apex-El Nido Mines produced nearly 17,000 ounces of gold and 2,400 ounces of silver in the period 1924-28, 1934-35, and 1937-39 according to interpretation of data recorded on a copy of U.S. Mint Service form 42D, Bullion memorandum, Apex-El Nido Mining Company accompanying an unpublished report on these properties by George L. Holmes (1941). According to Twenhofel, et al. (1949) George L. Holmes was directing an examination of these properties when the mines were visited by the U.S. Geological Survey in 1941. Data from the two mines are combined. However, based on the relative extent of workings, most production came from the Apex mine. The deposits consist of steeply dipping gold-bearing quartz veins localized in fault zones in diorite and amphibolite. Veins range from a fraction of a foot to four feet thick. Sulfide minerals are sporadically distributed in the veins. Pyrite and arsenopyrite are the most abundant. Erratically distributed scheelite also occurs in the veins on both properties. The scheelite occurs as small stringers in the veins and along vein walls. Some high grade scheelite pods have been reported in the El Nido mine, however, tungsten evidently was not recovered during mining. The main Apex vein strikes about N45°E and dips about 50° northwest and the El Nido vein strikes about N68°E and dips 30° to 80° southeast. The Apex mine is situated in a small roof pendant(?) of amphibolite which lies within a large diorite pluton that parallels Lisianski Inlet for more than 20 miles (plate 3). The El Nido workings are in the diorite about 1,000 feet from the amphibolite contact.

The Apex and El Nido veins or the fault systems containing them, if projected southwestward along strike, would converge in Apex Mountain. Since these structures dip away from one another, up dip projections would meet in a line sloping downward toward the southwest, a line which would be situated in the air between the mines, and which would intersect the topographic surface of the mountain at some point to the southwest of the workings. Rossman (1959) traced the Apex and El Nido vein systems to the southwest for about 1,500 and 2,000 feet respectively. It is not known whether they extend southwestward to some kind of intersection although this is suggested as a possibility, and geometrically could occur within a few hundred feet of a vein swarm exposed about 1,500 feet southwest of the portal of the main haulage level of the Apex mine and near the 2,000 foot elevation (plate 3). A nearly vertical fault, a straight line on aerial photographs, follows Cann Creek from its mouth to the summit of Apex Mountain and passes a few hundred feet easterly of the vein swarm noted. This fault offsets the diorite contact at the southwestern margin of the amphibolite body right laterally about 400 feet according to Rossman (1959, plate 12). This fault nearly bisects the angle between the Apex and El Nido systems. However, the relative age of movement on the three faults is not clear.

Development of the Apex and El Nido mines began in 1920. The Chichagof Mining Company took a bond on the Apex property and in 1920 and 1921 drove nearly 1,400 feet of tunnel at the 870 foot elevation. Accordding to Stewart (1922), this work was not sufficiently encouraging to operators expectations and the company released its option. They had evidently hoped to find the down dip projection of the Apex vein which was exposed in a drift at the 1,227 foot elevation. This drift was later known as the No. 2 level, and was the main working level during mining of this property. Mining comprised stoping the vein up dip for nearly 300 feet above that level, and for a similar distance along strike. The lower 870 foot level driven by Chichagof Mining Company in 1920 and 1921 became the main haulage (No. 1) level. In 1922 Jack Cann and associates extended the drift on the 1,227 foot level along the Apex vein. In 1923 they were preparing to drive a raise to intersect the vein (Buddington, 1925), evidently from the No. 1 level. This is probably the raise which now connects the No. 1 and No. 2 levels, and which became the main transfer raise through which the Apex ore was lowered to the main haulage level.

The vein was not reported on the No. 1 level and the only known mining below the No. 2 level occurred on a short sublevel 25 feet below the No. 2 level. This sublevel extends from the transfer raise about 100 feet to the portal area. A sharp geologic change of some kind evidently occurs a short distance below the No. 2 level. Faulting off of the vein is suggested. Other possibilities include the cut off of the vein by a dike, pinching out, or a sharp change in rock type. A fault was mentioned by Holmes (1941) as being about 70 feet below the No. 2 level. No information regarding its dip, strike, or relative movement, if any, were given.

While early development was occurring on the Apex vein under option to the Chichagof Mining Company, Jack Cann and his associates were developing the El Nido vein nearby. By 1923, when the owners of these properties formed the Apex-El Nido Mining Company to develop the two mines, most of the crosscuts, drifts and raises now present on the El Nido vein had been driven.

The El Nido vein has been developed on two levels which are connected underground with a small surface working. The 1,055 foot (lower) level, or haulage level, is connected with the 1,242 foot (upper) level by a transfer raise. A second raise joins the 1,242 foot level with a small open stope on a surface exposure of the vein in a steep gully at 1,350 feet in elevation. The vein has been opened along strike for 430 feet on the 1,242 foot level and has been explored by workings for about 370 feet up dip from the 1,055 foot level. Nearly all mining of the El Nido vein has occurred from or above the 1,242 foot level.

Although much of the earliest development on the Apex property was done under option, the Apex-El Nido Mining Company under the direction of Jack Cann, operated in the period, 1924 - 1928, and 1934 - 1935. The property was leased in 1932 to the Condor Mining Co. and some development work done. The lease was dropped later that year (Reed and Coats, 1941). No production is recorded for 1932. Although the operation of the mines in 1934 and 1935 was just after the rise in price of gold from $20.67 to $35.00 per ounce, the most productive years of operation as indicated by Holmes (1941) were 1925, 1926 and 1927.

In 1937 the property was leased to a person named Clothier, and in the following year, 1938, to John D. Littlepage. Littlepage had managed the Hirst-Chichagof mine 10 years earlier, and took over management of the Chichagof mine the following year. Both were well known as gold producers in Alaska before World War II, and are described by Still and Weir, (1981). According to Smith (1939) considerable prospecting was done in 1938 under lease on the Apex - El Nido Mining Company property, and some ore was recovered and milled. He also indicated that the lease was cancelled late that season and the owners planned to carry on further development themselves. Mrs. Jenny Cann, through a manager employed by her, operated the property in 1939, the last year of mining. Mrs. Cann controlled the Apex - El Nido property for more than 15 years following the death of her husband, Jack Cann in late 1935 or early 1936. The circumstances surrounding cancellation of Littlepage's lease are not entirely clear.

Present Investigations

Reconnaissance examination of the Apex and El Nido properties during the present study revealed that the condition of the underground workings in 1978-1979 was such that although both El Nido levels were sampled, only the No. 2 Apex level was accessible and no stope in either mine was safe to enter. The stopes could not be mapped or sampled and therefore, much of the most critical information necessary for appraisal of the property was unavailable. Although timbering in both mines is rotting, that in the El Nido workings appears to be in better condition than in the Apex. The Apex workings are especially dangerous at the collar of the transfer raise in the floor of the 1227 foot main working level.

The portal of this level is nearly blocked by slide rock which has sloughed back into the entry for some distance. Ventilation in the accessible workings of both mines is good.

Samples were obtained during the present study from veins seen underground and exposed in surface outcrops. Twenty-three samples were taken in each of the El Nido levels, 27 in the No. 2 Apex level, and 85 samples from the cirque above the Apex mine. Three others were obtained from a possible easterly extension of the El Nido vein. Sample locations are shown on plates 4, 5, and 6, and results of analyses are given in tables 4 thru 11, where gold, silver, and tungsten values are reported.

Veins sampled in the El Nido workings assayed from a trace to 3.8 ounces gold per ton across widths of 0.2 to 2.3 feet. Distribution of the better values was spotty and most came from samples taken in the upper level. Samples of associated aplite dikes assayed a trace to 0.04 ounce gold per ton. More consistent gold assays were obtained from the No. 2 level of the Apex mine where 8 samples assayed from 0.09 to 5.05 ounces per ton from vein exposures aligned along the northwest wall of the drift for more than 300 feet. Assays of samples of veins in the cirque above the Apex mine ranged from nil to 1.12 ounces gold per ton across widths of 0.2 to 3.3 feet. Gold content of 0.1 ounce per ton or more was reported in 8 assays of the surface samples.

All surface and underground samples were analyzed for tungsten. The ten highest values for 157 representative samples of measured width range from 0.11 to 3.1 percent tungsten. Seven of these values are from samples whose sample sites are distributed throughout the two El Nido levels and the other three are from the extremities of the surface vein system above

TABLE 4. Assay data, El Nido mine, upper workings

				Analysis								
				PPM						Oz./Ton		
		Sample Length		AAS	AAS	AAS	AAS	Spec	Colori-metric	Fire Assay	Fire Assay	
Sample	Type	Feet	(Cm)	Cu	Pb	Zn	Au	As	WO_3	Au	Ag	Description
9K501	Channel	0.7	21	32	L 1	101	0.04	–	< 5	0.075	0.1	Sheeted quartz vein
9K502	do.	4.0	122	111	51	250	1.4	–	136	Nil	Nil	Dike
9K503	do.	2.3	70	108	1090	3100	5.4	–	151	0.045	1.6	Quartz vein
9K504A	do.	0.9	27	64	910	1300	5.6	–	126	0.11	1.0	Quartz vein, footwall section
9K504B	do.	0.6	18	108	620	1500	1.6	–	1000	0.04	0.5	Sheeted aplite dike inclusion in above vein, with pyrite and pyrrholite
9K504C	do	0.8	24	94	29	1500	0.58	–	126	0.02	0.1	Quartz vein, hanging wall section
9K504D	do.	1.2	37	38	57	157	0.16	–	< 5	Tr	Tr	Aplite dike on footwall of above vein
9K505	do.	1.5	46	67	160	203	0.58	–	40	0.04	0.2	Quartz vein
9K506	do.	1.0	30	61	53	390	2.0	–	30	0.03	0.2	do.
9K507	SAMPLE NOT TAKEN											
9K508	Channel	0.7	21	83	273	850	8.0	–	50	0.13	0.4	Quartz vein
9K508A	do.	–	–	21	1	74	0.04	–	5	Nil	Nil	Dike or gouge ?
9K509	?	?	?	30	33	92	8.1	–	< 5	0.67	0.1	–
9K510	Channel	0.8	24	140	360	1600	0.86	–	50	0.05	0.6	Quartz vein
9K511	Chip	1.0	30	7	5	89	0.02	–	5	Nil	Nil	Aplite dike on footwall of vein
9K512	Channel	1.4	43	81	201	650	4.2	–	1765	0.13	0.3	Quartz vein
9K513A	do.	0.6	18	67	480	480	6.6	–	19,000	0.21	0.4	do.
9K513B	Chip	0.7	21	1	–	–	–	–	–	–	–	Aplite dike on hanging wall of above vein
9K514	Channel	0.8	24	7	242	50	8.8	–	416	0.025	0.2	Quartz vein
9K515	do.	0.3	9	16	370	283	6.8	–	504	0.08	0.4	Sheeted quartz vein
9K516	do.	0.7	21	380	2900	1900	106	–	1387	3.80	2.1	Quartz vein
9K517	do.	0.3	9	73	440	338	13	–	1765	–	–	Sheeted quartz vein
9K518	do.	0.6	18	68	97	520	7.0	–	-5	–	–	Quartz vein
9K519	do.	0.7	21	76	100	520	0.84	–	126	0.13	0.3	Sheeted quartz vein

TABLE 5. Assay data, El Nido mine, lower workings

Sample	Type	Sample Length		Analysis								Description
				PPM						Oz./Ton		
		Feet	(Cm)	AAS Cu	AAS Pb	AAS Zn	AAS Au	Spec As	Colori-metric WO_3	Fire Assay Au	Fire Assay Ag	
9K520	Channel	0.7	21	35	340	990	4.6	–	10	0.05	0.4	Quartz vein
9K521	do.	1.2	37	57	127	520	0.14	–	252	Tr	Tr	do.
9K521A	do.	1.2	37	48	2	46	<.02	–	5			do.
9K522	do.	0.3	9	33	960	226	9.4	–	1513	0.15	0.5	do.
9K523A	do.	0.9	27	15	162	156	0.16	–	5044	Tr	Tr	do.
9K523B	Chip	1.2	37	60	5	53	<.02	–	126	Tr	Tr	Aplite dike on footwall of above vein
9K523C	do.	1.2	37	24	71	50	0.08	–	20	0.01	0.2	Aplite dike with pyrite on hanging wall of above vein
9K524A	Channel	0.8	24	25	340	680	0.76	–	15	0.25	0.1	Quartz vein
9K524B	–	–	–	18	4	49	0.06	–	10			
9K525	Channel	1.9	58	70	70	321	0.28	–	201	0.01	0.1	do.
9K526	do.	1.6	49	32	185	185	4.8	–	45	0.075	0.2	do.
9K526A	do.	2.2	67	46	45	79	0.04	–	5			Aplite dike on footwall of above vein
9K527	do.	0.2	6	124	7	351	6.9	–	45	0.42	0.1	Quartz vein
9K528A	do.	0.4	12	94	53	347	1.0	–	504	0.03	0.1	do.
9K528B	Chip	1.2	37	15	< 1	52	<.02	–	12	Tr	Tr	Aplite dike in footwall of above vein
9K528C	do.	1.7	52	114	9	76	0.18	–	20	0.02	Tr	Aplite dike on hanging wall of above vein
9K529	Channel	0.4	12	114	29	500	0.18	–	1059	0.01	Tr	Quartz vein with pyrite and scheelite
9K530	do.	0.6	18	–	–	–	–	–	–	0.01	0.2	Quartz vein with pyrite stringers
9K530A	do.	1.7	52	20	8	66	0.14	–	15	0.005	Tr	Aplite dike with pyrite and pyrrhotite on hanging wall of above vein
9K530B	do.	1.7	52	17	2	66	0.06	–	50	Tr	Tr	Aplite dike on vein footwall
9K531	Channel	0.25	8	49	67	700	0.20	–	1387	0.005	0.1	Quartz vein
9K532	do.	0.7	21	31	510	1030	1.0	–	4539	0.01	0.2	Quartz vein with scheelite
9K532A	do.	4.0	122	71	2	70	2.8	–	126	Tr	Tr	Aplite dike on footwall of above vein

TABLE 6. Assay data, Apex mine, main working level

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis PPM AAS Cu	AAS Pb	AAS Zn	AAS Au	Spec As	Colori-metric WO_3	Oz./Ton Fire Assay Au	Fire Assay Ag	Description
9K533	Channel	2.7	82	630	40	79	0.60	–	10	Tr	Tr	Quartz vein
9K534	do.	1.5	46	16	2	7	0.52	–	< 5	0.015	Tr	Quartz vein with arsenopyrite
9K535	do.	0.7	21	58	37	36	3.0	–	30	0.045	0.1	Quartz vein with sulfides
9K536	do.	?	–	650	4	67	0.10	–	126	Tr	Tr	Quartz vein
9K537	do.	0.6	18	43	< 1	11	0.10	–	25	Tr	Tr	Quartz vein with sulfides
9K538	do.	0.75	23	64	< 1	12	<.02	–	5	Tr	Tr	Quartz vein
9K539	do.	0.9	27	29	47	12	0.24	–	< 5	Tr	Tr	do.
9K540	do.	0.8	24	5	3	10	14	–	5	0.455	Tr	do.
9K541	do.	3.0	91	33	3	7	0.32	–	< 5	0.005	Tr	do.
9K542	do.	1.6	49	19	5	11	4.0	–	< 5	0.185	.1	do.
9K543	do.	1.7	52	265	15	33	0.38	–	252	0.015	Tr	do.
9K543A	select Grab	–	–	356	52	57	0.32	–	95,000	0.01	0.1	Quartz stringer with scheelite
9K544	Channel	1.5	46	32	19	10	0.16	–	252	0.015	Tr	Quartz vein
9K545	do.	1.3	40	140	12	10	0.14	–	605	Tr	Tr	Quartz vein with sulfides
9K546	do.	0.5	15	349	10	28	0.98	–	45	0.02	Tr	Quartz vein
9K547	do.	0.3	9	152	61	28	0.50	–	30	0.01	0.1	Quartz vein with sulfides
9K548	do.	0.35	11	9	5	8	5.2	–	252	0.090	Tr	Quartz vein
9K549	do.	0.3	9	18	9	29	16	–	15	0.55	0.1	do.
9K550	do.	0.5	15	34	45	41	26	–	< 5	1.145	0.2	do.
9K551	do.	0.6	18	530	190	86	91	–	5	5.05	0.6	Quartz vein with arsenopyrite and chalcopyrite
9K552	do.	0.7	21	213	8	23	2.0	–	20	0.025	Tr	Quartz vein with sulfides
9K553	do.	0.6	18	304	7	11	0.46	–	8	Nil	Nil	do.
9K554	do.	0.6	18	110	440	21	0.10	–	5	0.01	0.3	Quartz vein with partings of altered host rock
9K555	do.	1.3	40	470	75	37	0.26	–	45	0.005	0.1	Quartz vein with pyrite
9K556	do.	0.8	24	34	8	40	9.3	–	100	0.76	0.1	Quartz vein with inclusions of altered diroite
9K557	do.	0.7	21	21	30	12	36	–	< 5	1.835	0.2	Quartz vein
9K558	do.	0.8	24	115	103	12	0.79	–	< 5	0.02	0.1	Quartz vein with arsenopyrite and pyrite

TABLE 7. Assay data, Cirque above Apex (surface samples)

Sample	Type	Sample Length		Analysis								Description
				PPM			Oz/Ton		PPM	Percent		
							Fire Assay		Colorimetric	X-Ray	Fluorescence	
		Feet	(Cm)	Spec Au	Spec W	AAS Au	Au	Ag	W[1]	WO_3[2]	W[1]	
8K136	Channel	0.9	27	15	500	4.5	0.10	0.8	400	–	–	Fe St Qz Vn w/ Py & As
8K137	do.	0.8	24	3	100	0.70	.03	0.3	60	–	–	do.
8K138	do.	0.9	27	N	N	0.10	Nil	0.2	16	–	–	Fe St Qz Vn w/ sulfides
8K138A	do.	0.9	27	N	N	0.45	Nil	0.1	10	–	–	Weathered dike
8K139	do.	0.7	21	2	100	0.50	.02	0.2	200	–	–	Fe St platy Qz Vn
8K140	do.	0.9	27	7	100	5.5	.10	0.3	240	–	–	Qz Vn w/ sulfides
8K141	do.	1.4	43	5	1500	1.5	.05	0.3	–	–	0.31	Fe St Qz Vn w/ Py & As
8K141A	do.	0.7	21	N	N	0.35	Nil	0.1	20	–	–	Weathered fractured dike
8K142	do.	0.7	21	5	500	12.0	.25	0.3	600	–	–	Fe St Qz Vn w/Py & As
8K143	do.	0.8	24	3	500	0.70	.015	0.2	600	–	–	do.
8K144	do.	1.2	37	7	50	1.5	.05	0.3	140	–	–	do.
8K145	do.	0.9	27	5	200	1.0	.03	0.2	400	–	–	Qz Vn w/ sulfides
8K146	do.	0.7	21	7	200	1.5	.035	0.2	20	–	–	Fe St Qz Vn w/ sulfides
8K147	do.	0.7	21	15	500	1.0	.07	0.1	400	–	–	Fe St Qz Vn
8K148	do.	1.0	30	2	100	0.10	Nil	0.1	400	0.08	–	Fe St Qz Vn w/ sulfides
8K149A	Channel	0.9	27	3	50	3.0	.10	0.3	140	–	–	Fe St Qz Vn
8K149B	Chip	1.3	40	N	N	N	Nil	0.1	12	–	–	Weathered dike
8K150	Channel	0.7	21	1	N	N	Nil	0.1	<5	–	–	Fe St Qz Vn w/sulfides
8K151	do.	0.8	24	1	N	1.0	.05	0.2	8	–	–	Qz Vn
8K152	do.	0.6	18	3	N	3.5	.06	0.2	16	–	–	do.
8K153	do.	0.9	27	N	N	0.15	Nil	0.1	10	–	–	Fe St Qz Vn
8K153A	do.	1.8	55	N	N	N	Nil	0.1	<5	–	–	Weathered dike
8K154	do.	0.3	9	15	N	5.0	.085	1.0	<5	–	–	Fe St Qz Vn w/ As
8K155	do.	0.3	9	5	N	0.35	.01	0.2	8	–	–	Qz Vn
8K156	do.	2.1	64	7	N	47	.01	0.4	8	–	–	Fe St Qz Vn
8K157	Select Channel	1.8	55	500	N	20	1.12	15.0	8	–	–	Fe St Qz Vn w/ As
8K158	Channel	1.7	52	50	100	6.5	.08	0.6	200	–	–	Qz Vn w/ As
8K159	Channel	0.8	24	3	100	L	Nil	0.1	100	–	–	Qz Vn

TABLE 7. Assay data, Cirque above Apex (surface samples) (cont.)

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis PPM Spec Au	PPM Spec W	PPM AAS Au	Oz/Ton Fire Assay Au	Oz/Ton Fire Assay Ag	PPM Colorimetric W[1]	Percent X-Ray WO_3[2]	Percent Fluorescence W[1]	Description
8K160A	Channel	0.7	21	15	N	0.2	0.02	0.6	20	–		Qz Vn
8K160B	do.	1.1	33	2	N	0.2	Nil	0.1	8	–		Qz Vn w/ As
8K161A	do.	0.5	15	N	100	0.1	0.01	0.1	40	–		Qz Vn w/ sulfides
8K161B	Chip	2.7	82	0.5	N	N	Nil	Tr	<5	–		Weathered fractured dike
8K161C	Channel	0.5	15	N	N	N	0.01	Tr	20	–		Qz Vn w/sulfides separated
8K161D	do.	2.1	64	3	50	0.05	Nil	0.2	20	–		Qz Vn by 10cm
8K162	do.	0.3	9	N	300	0.05	Nil	0.1	200	–		do.
8K163	do.	0.3	9	N	300	14	0.01	Tr	400	–		Fe St Qz Vn
8K164	do.	0.3	9	0.5	1000	0.80	0.01	Tr	400	–		do.
8K165	do.	0.3	9	N	200	2.0	.075	Tr	240	–		do.
8K166	do.	0.6	18	5	50	0.10	Nil	0.2	220	–		Fe St Qz Vn w/As
8K167	do.	0.6	18	1	N	0.10	Nil	0.1	<5	–		do.
8K168	do.	0.8	24	1	N	L	Nil	0.1	<5	–		Fe St Qz Vn
8K169	do.	0.5	15	1	N	0.2	Nil	Tr	<5	–		Qz Vn
8K170	do.	0.3	9	N	N	N	Nil	0.1	12	–		Fe St Qz Vn
8K171	do.	0.8	24	3	N	0.05	Nil	0.2	12	–		do.
8K172	do.	0.8	24	1	N	0.05	Nil	0.2	<5	–		do.
8K173	do.	0.9	27	5	1000	1.5	0.01	0.3	–	–	0.60	Qz Vn
8K174	do.	3.3	101	10	1000	0.30	Nil	0.4	–	0.05	0.42	do.
8K174A	do.	0.5	15	10	N	N (.05)	Nil	0.2	<5			Qz Vein
8K175	do.	1.9	58	15	N	0.20	.005	0.6	14	–		Qz Vn w/sulfides
8K176	do.	0.13	40	N	N	4.0	0.09	0.1	6	–		do.
8K177	do.	1.2	37	1	N	1.5	0.13	0.1	<5	–		do.
8K178	do.	1.1	33	N	N	0.40	0.02	0.1	<5	–		do.
8K179	do.	0.4	12	N	N	0.50	0.01	0.1	36	–		Fe St Qz Vn
8K180	do.	0.3	9	0.5	N	0.40	.015	0.2	12	–		Fe St Qz Vn w/sulfides
8K181	do.	0.8	24	0.5	N	0.80	Nil	0.2	6	–		Fe St Qz Vn w/Py & As
8K182	do.	0.8	24	2	500	1.0	0.01	0.3	360	–		Fe St platy Qz Vn w/sulfides
8K184	do.	0.6	16	0.5	N	N	Nil	0.1	12	–		Fe St Qz Vn

TABLE 7. Assay data, Cirque above Apex (surface samples) (cont.)

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis PPM Spec Au	PPM Spec W	PPM AAS Au	Oz/Ton Fire Assay Au	Oz/Ton Fire Assay Ag	PPM Colorimetric W[1]	Percent X-Ray WO_3[2]	Percent Fluorescence W[1]	Description
8K185	Channel	0.6	18	3	N	1.0	0.01	0.2	14	-		Fe St Qz Vn w/As
8K186	do.	0.5	15	0.5	N	0.20	Nil	0.2	10	-		Fe St Qz Vn
8K187	do.	0.3	9	2	N	0.55	.005	0.1	8	-		do.
8K188	do.	0.3	9	3	100	3.0	0.01	0.1	360	-		Fe St Qz Vn w/As
8K189	do.	0.4	12	5	L	2.0	0.02	0.3	60	-		do.
8K190	do.	?	?	1	N	0.40	.005	0.2	<5	-		-
8K191	do.	0.9	27	0.5	500	0.30	.005	0.1	600	-		Fe St Qz Vn
8K192	do.	0.8	24	1	300	0.80	0.02	0.2	280	-		Fe St Qz Vn w/sulfides
8K193	do.	0.9	27	1	N	0.50	0.01	0.1	14	-		Fe St Qz Vn w/Py
8K194	do.	0.7	21	3	N	0.85	0.03	0.3	12	-		do.
8K195	do.	0.5	15	3	N	2.0	0.05	0.2	60	-		do.
8K196	do.	0.9	27	1	L	N	Nil	0.1	10	-		Qz Vn w/sulfides
8K197	do.	0.6	18	1	300	0.10	Nil	0.1	280	-		do.
8K198	do.	1.2	37	3	50	0.10	.005	0.1	60	-		Fe St Qz Vn
8K199	do.	1.7	52	10	50	2.5	0.04	0.2	40	-		Qz Vn w/Py & inclusion of altered diorite dikes (?)
8K200A	do.	0.3	9	5	200	0.40	0.01	0.1	320	-		Qz Vn
8K200B	do.	1.5	46	0.5	N	10	0.22	0.1	36	-		Dike horse
8K200C	do.	0.5	15	0.5	N	0.15	0.01	0.1	40	-		Qz Vn
8K201A	do.	0.3	9	2	500	0.30	0.01	Tr	400	-		Qz Vn on Hw of dike sampled by 8K201B
8K201B	Chip	1.6	49	N	N	0.05	Nil	0.1	10	-		Dike part diorite w/sulfides
8K201C	Channel	0.2	6	5	200	0.35	0.01	0.1	320	-		Qz Vn on Fw of dike sampled by 8K201B

St = Stain Vn = Vein Fw = Footwall Py = Pyrite
Qz = Quartz Hw = Hanging wall Fe = Iron As = Arsenopyrite

1/ 1979 Reno analyses
2/ 1978 Reno analyses

TABLE 8. Assay data, Cirque wall above Apex (see copy plate 20B Bull 929)

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis PPM Spec Ag	Analysis PPM Spec W	Analysis PPM AAS Au	Analysis Oz/Ton Fire Assay Au	Analysis Oz/Ton Fire Assay Ag	Analysis PPM Colorimetric W1/	Description
8K115	Channel	2.5	76	7	200	4.5	0.05	0.1	60	White Qz Vn
8K116A	do.	1.4	43	N	100	0.10	Nil	0.1	32	Moderately stained Qz Vn
8K116B	do.	1.0	30	5	N	0.20	Nil	Tr	<5	Qz Vn
8K117A	do.	0.9	27	5	N	7.0	0.18	Tr	20	Fe St Qz Vn, < sulfides
8K117B	do.	0.8	24	2	N	1.0	Nil	Tr	16	Fe St Qz Vn
8K117C	do.	0.7	21	L	100	0.50	Nil	Tr	16	do.
8K118A	do.	0.8	24	5	150	0.20	Nil	Tr	180	Qz Vn
8K118B	Channel	0.4	12	2	L	0.60	Nil	Tr	20	do.

1/ 1979 Reno analyses

TABLE 9. Assay data, El Nido easterly extension (surface samples)

				Analysis							
				PPM			Oz/Ton		PPM	%	
		Sample Length		Spec	Spec	AAS	Fire Assay		Colorimetric	X-ray	
Sample	Type	Feet	(Cm)	Ag	W	Au	Au	Ag	W 1/	WO_3 2/	Description
8K202	Channel	1.3	39	N	N	0.40	0.05	0.1	20	<.01	Qz Vn w/ Fe partings
8K203	Channel	0.3	10	N	L	0.40	0.02	Tr	12	<.01	Qz Vn in stream bed
8K204	Channel	0.3	10	N	N	N	0.02	Tr	360	0.07	Qz Vn in brown alt. zone

1/ 1979 Reno analyses
2/ 1978 Reno analyses

TABLE 10. Assay data, Apex - El Nido underground samples

Sample	Type	Sample Length Feet	Sample Length (CM)	Analysis PPM Spec Au	PPM Spec W	PPM AAS Au	Oz/Ton Fire Assay Au	Oz/Ton Fire Assay Ag	PPM Colorimetric W[1/]	Percent X-Ray Fluorescence WO_3[2/]	Percent X-Ray Fluorescence W[1/]	Description	
El Nido underground samples													
8K130	Select Composite	-	-	10	1000	15	0.29	0.2	-	0.66	0.50	Qz Vn w/scheelite	Above average grade
8K131	Composite Grab	-	-	5	1000	0.45	Nil	0.2	-	3.5	3.2	do.	
8K132	Select Composite	-	-	10	2000	21	1.04	0.5	-	16.0	14.0	do.	
Apex underground samples													
8K207	Select Grab	-	-	0.5	1000	1.0	0.30	Tr	-	0.48	0.37	Scheelite pod adj to 40 cm Qz Vn	
8K208	Cont. Chip	0.5	16	N	L	0.10	tr	Tr	36	<.01	-	Qz Vn w/ <scheelite	
8K209	Cont. Chip	0.6	18	0.5	N	0.10	Nil	Tr	12	<.01	-	Qz Vn in short drift face	

Note: 8K132 - select composite grap sample of the most scheelite (?) fluorescent material blacklight would reveal.

1/ 1979 Reno analyses
2/ 1978 Reno analyses

TABLE 11. Assay data, Mouth of Cann Creek, stream sediments

Sample	Type	Analysis		
		PPM		
		AAS	Spec	Spec
		AU	AG	W
8K029	Stream Sediment	0.40	N	100
8K030	do.	4.0	3	150

the Apex mine. Tungsten was also measured in stream sediments at the mouth of Cann Creek a mile downstream from the mill (table 8).

The vein structure in the cirque above the Apex mine was considered as probably on the up dip projection of the Apex structure, and is the most prominent and persistent vein system seen in the cirque above the mine. The surface vein, or other veins aligned with it along the same trend, can be traced for more than 1,000 feet southwest from the most northeasterly sample site of the present study (No. 8K144). This sample site is more than 400 feet southwest of the Apex mine No.2 portal. Plates 3 & 6 show this vein's relationship to other features in the area. The vein is delineated by Brunton and tape surveys made during the 1978 sampling. This vein closely matches the most persistent and extensive vein system shown on Rossman's Plate 13 (1959). It also closely conforms in plan, profile, and intercepts to a vein indicated by Holmes (1941) as the southeasterly extension of the Apex vein using assay maps and an assay profile credited largely to a 1929 report by F. Cushing Moore. Earlier surveys confirm the position of the vein as shown on Moore's maps which accompany Holmes' 1941 report.

The Apex ore shoot plunges northeast about 50 to 60 degrees according to Rossman (1959). Geometrically this is the angle in the plane of the vein between the strike and the down trend of the ore shoot along its axis. The plan view or horizontal projection of the axis of the ore shoot for this vein, would then bear N25° - 35°E and the vertical angle between the axis of the ore shoot and a horizontal plane would be slightly less than the dip of the vein.

The downward projection of the vein from the No. 2 Apex level evidently meets a sharp geological change not far below that level. Holmes (1941) mentions a fault; however, strike, dip, and relative movement aren't given. The vein was evidently not observed in the No. 1 level although this working was driven in search of the vein. The Apex mine had good showings in the No. 2 level, and since the vein was stoped up dip for 300 feet above this level it is reasonable that values probably persisted downward also. If the vein is offset by a fault below, its downward extension beyond the fault plane may be a logical target to seek. Whether diamond drilling in order to establish vein intercepts was done at any time from points in the No. 1 level, out of the plane of the vein, isn't known. No physical assessment of the circumstances surrounding faulting off or other geological change could be made during this study because of the condition of the workings.

If the vein is not lost due to faulting and the ore shoot exists as projected on the basis of the geometry described, at least part of the ore shoot has been removed by erosion, how much depends on the thickness of slide rock and talus cover over bedrock below the No. 2 portal.

A projection of the Apex ore shoot upward, using the same geometry, would come out of the ground some 400 to 600 feet southwest of the Apex No. 2 portal, in the vicinity of the surface vein sampled in the cirque above the mine. Whether such a projection is justified is open to question, because of the sharp cut-off of the stopes as they appear on maps at the 1,469 foot or No. 4 level. No physical assessment was made because of the condition of the workings. If the vein sampled in the cirque above the workings is the upward continuation of the Apex vein, and considering the gold values obtained in 1978 from this vein it appears as though the values were perhaps too low for the vein to have been stoped farther up dip. If, on the other hand, the vein sampled in 1978 is not the up dip continuation of the Apex vein, the problem still remains as to why mining was not carried farther up dip but rather was stopped at the No. 4 level.

The map features, profile, and certain intercepts of the Brunton, tape and aneroid altimeter map made of the cirque vein during sampling in 1978 closely match those of the vein shown on two maps and a profile accompanying Holmes' 1941 report and credited largely to a 1929 report of F. Cushing Moore. Why the assay values shown on Moore's map are systematically at least half an order of magnitude higher than those obtained by the Bureau of Mines from 85 moil cut and measured samples is not known.

In 1941 Holmes reported reserves of 26,633 tons of ore containing $899,130 in gold then valued at $35/oz. and indicating an average grade of 0.945 oz. gold per ton. A Bureau of Mines mine simulation study indicates that a 30,000 ton ore body, if present on this property, would probably be economic to mine now if the average ore value were $200 per ton or more, based on 1978 dollars.

Bon Tara Prospect

A gold bearing quartz vein in dioritic rocks on the eastern tip of Yakobi Island northwest of Miner Island was first located about 1887 according to Buddington (1925) (plate 1). Overbeck (1919) described the occurrence in 1917 and indicated that about 30 years previously a 35 foot tunnel had been driven and that about $1,100 in gold had been recovered. The prospect is currently held under the Bon Tara claims located by Joe

TABLE 12. Assay data, Bon Tara prospect, rock samples

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis Oz/Ton Fire Assay Au	Analysis Oz/Ton Fire Assay Ag	Analysis PPM AAS Cu	Description
Dump							
8K001	Composite Grab	-	-	Nil	Tr	1600	Iron stained quartz with chalcopyrite and pyrite
Adit							
8K002	Channel	0.3	9	Nil	Tr	60	Quartz Vein
8K003	Spaced chip .5ft interval	3.0	90	Nil	Nil	80	Sheared gabbro on hanging wall of above vein
8K004	Channel	0.6	18	Nil	Nil	45	Quartz vein
8K005	Spaced chip .5ft interval	2.6	79	Nil	Nil	90	Sheared gabbro
8K006	Channel	0.5	15	0.05	Tr	70	Quartz vein and stringers in gouge zone
8K007	Spaced chip .5ft interval	2.8	85	0.01	Tr	70	Hanging wall of above vein
9K268	Channel	0.3	9	0.01	Tr	160	Quartz vein with partings of sheared gabbro
9K269	do.	0.2	6	Nil	Nil	230	do.
9K270	Chip	3.4	104	Nil	Nil	75	Gabbro, some sheared sections
9K271	Channel	0.7	21	Nil	Ni	25	Quartz vein with partings of sheared gabbro
9K272	do.	0.3	9	Nil	Nil	65	Quartz vein
9K272A	do.	0.6	18	Tr	Tr	110	Hanging wall of above vein
9K272B	do.	0.2	6	Nil	Nil	160	Footwall of above vein
9K273	do.	0.5	15	Tr	Tr	50	Quartz vein
9K274	do.	0.7	21	Tr	Tr	130	Quartz vein with partings of sheared gabbro
9K275	do.	0.8	24				Quartz vein
9K276A	Channel	0.6	18	Nil	Nil	80	Quartz vein with partings of sheared gabbro
9K276B	Chip	2.8	85	0.005	0.01	85	Hanging wall of above vein
9K277	Channel	0.7	21	Nil	Nil	45	Quartz vein

TABLE 12. Bon Tara prospect (cont.)

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis Oz/Ton Fire Assay Au	Analysis Oz/Ton Fire Assay Ag	Analysis PPM AAS Cu	Description
			Open Cut				
8K008	Channel	0.8	24	Nil	Nil	140	Quartz vein w/pyrrhotite
8K009	Select Grab	-	-	0.16	Tr	1000	Quartz pod with pyrite
9K449	Chip	2.4	73	Nil	Nil	1380	Quartz pod with minor pyrite
9K450A	Channel	0.6	18	0.01	Tr	166	Quartz vein with pyrite
9K450B	Chip	1.0	30	Nil	Nil	53	Sheared gabbro on hanging wall of above vein
9K451	Select Grab	-	-	Nil	Nil	1	Iron-stained sections of quartz pod
9K452	Channel	0.6	18	Nil	Tr	8	Quartz vein
9K453	do.	0.7	21	Nil	0.1	101	Quartz vein with partings of sheared gabbro
9K454A	Chip	2.0	61	Nil	Nil	4	Quartz pod
9K454B	do.	2.0	61	Nil	Tr	2	do.
9K455	Select Grab	-	-	Nil	Nil	84	Iron-stained amphibolite w/pyrite and pyrrhotite
			Trench at 80 ft. elevation				
8K031	Channel	0.9	28	Tr	Nil	5	Quartz vein with pyrite and minor chalcopyrite(?)
8K032	do.	0.6	17	0.01	Tr	15	Quartz vein
			Float at 30 ft. elevation				
8K033	Grab	-	-	0.01	Tr	L	Angular quartz float

TABLE 13. Assay data, Bon Tara prospect, soil samples

Sample	Type	Analysis Oz/Ton Fire Assay Au	Analysis Oz/Ton Fire Assay Ag
9K278	Soil	Tr	Tr
9K279	do.	Nil	Nil
9K280	do.	Nil	Nil
9K281	do.	Nil	Nil
9K282	do.	Nil	Nil
9K283	do.	Nil	Nil

Ott and Loren Logie in 1973.

Local folklore holds that most of a kerosene can of quartz from extreme low tide 15-20 feet from a tunnel in this vicinity panned $1,500 from mortared quartz, probably in the late 1920's or early 1930's. In 1974 the owners contacted the Bureau of Mines, hoping to substantiate a report of some $28,000 as having been recovered from a prospect in this area on Yakobi Island between 1923 and 1930. This report remains unconfirmed.

During the present study a 35 foot adit and several open cuts were mapped. Channel samples of measured width were taken across the vein (figures 3 and 4, and tables 12 and 13). Underground samples assayed from nil to 0.05 ounce gold per ton, while vein samples from surface cuts along strike assayed nil to 0.16 ounces gold per ton. A quartz vein exposed in a trench at an elevation of 75 feet and up the hill along the strike to the southwest contained nil to 0.01 ounce gold per ton.

Mrs. Eve Ott, the present owner of the claims, showed the Bureau of Mines personnel high grade gold quartz specimens which, according to her late husband, Joe Ott, came from this property. It is entirely possible that some of the apparently relatively low grade gold-bearing quartz veins in this area contain zones and pockets of very high grade material. Such appears to be the case at the Goldwin prospect a mile to the south on Chichagof Island.

Some of the vein quartz exposed on the lower part of the beach contains small amounts of pyrite and pyrrhotite, and traces of chalcopyrite. Gold-bearing quartz veins containing sulfides often have their higher gold values in their sulfide-bearing portions. Further search of

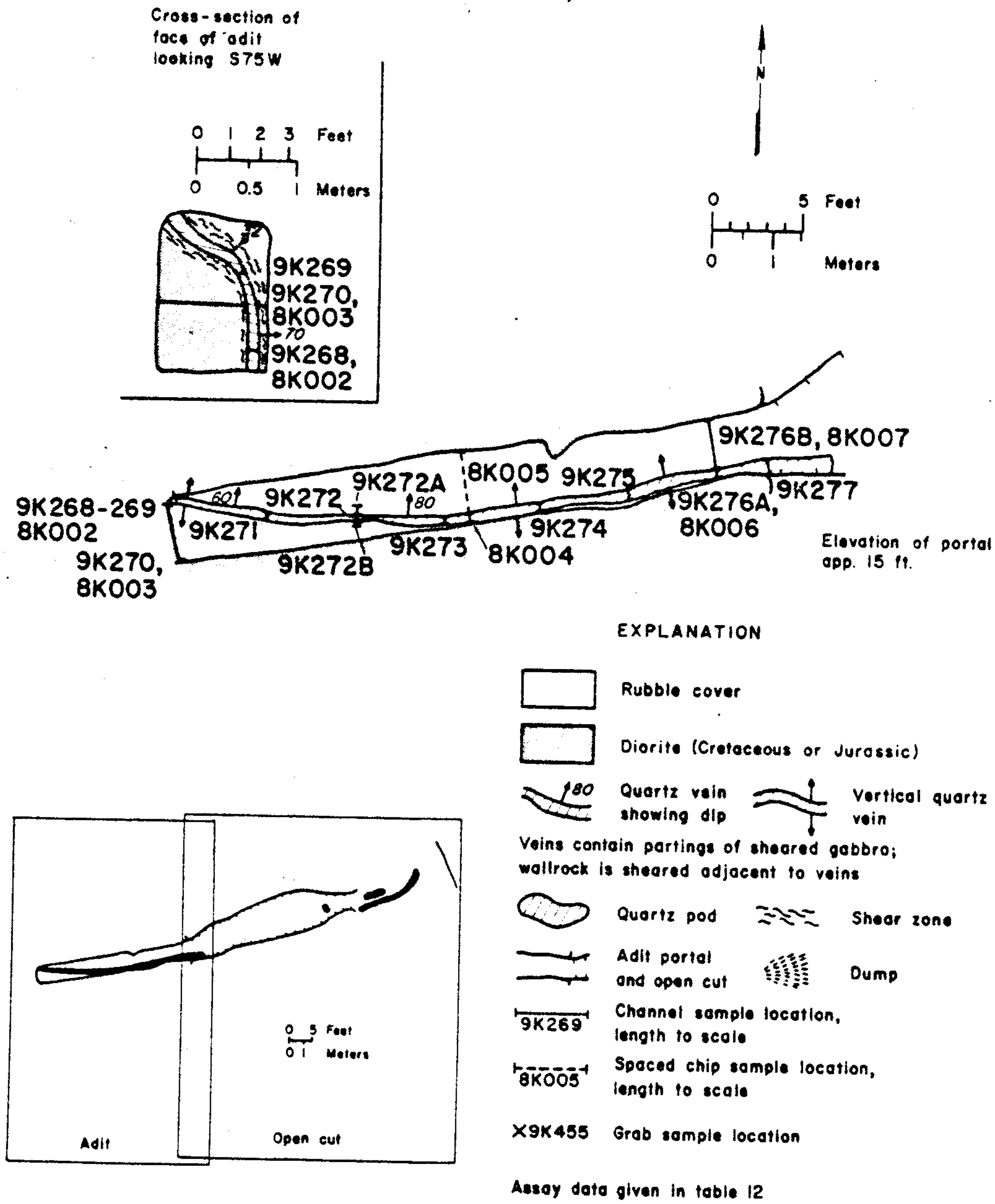
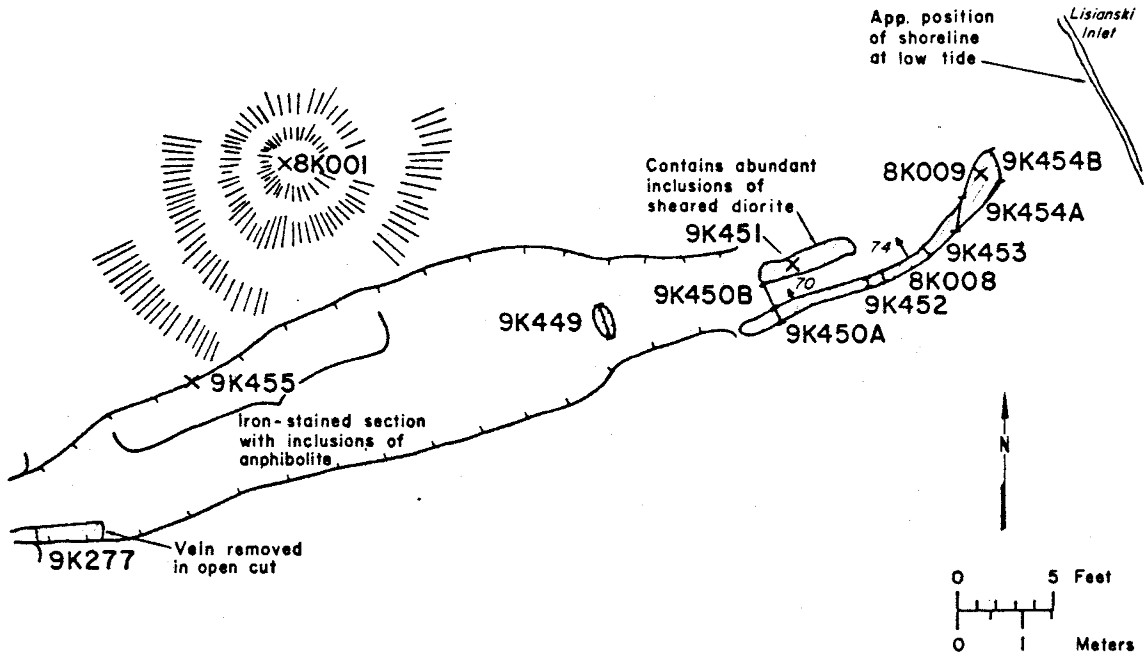


FIGURE 3. - Bon Tara prospect, adit and open cut, sample locations


App. position
of shoreline
at low tide
Lisianski
Inlet
×8K001
Contains abundant
inclusions of
sheared diorite
8K009
9K454B
9K454A
9K451
74
9K453
8K008
9K450B
70
9K452
9K449
9K450A
9K455
Iron-stained section
with inclusions of
anphibolite
N
9K277
Vein removed
in open cut
0
5 Feet
0
1
Meters

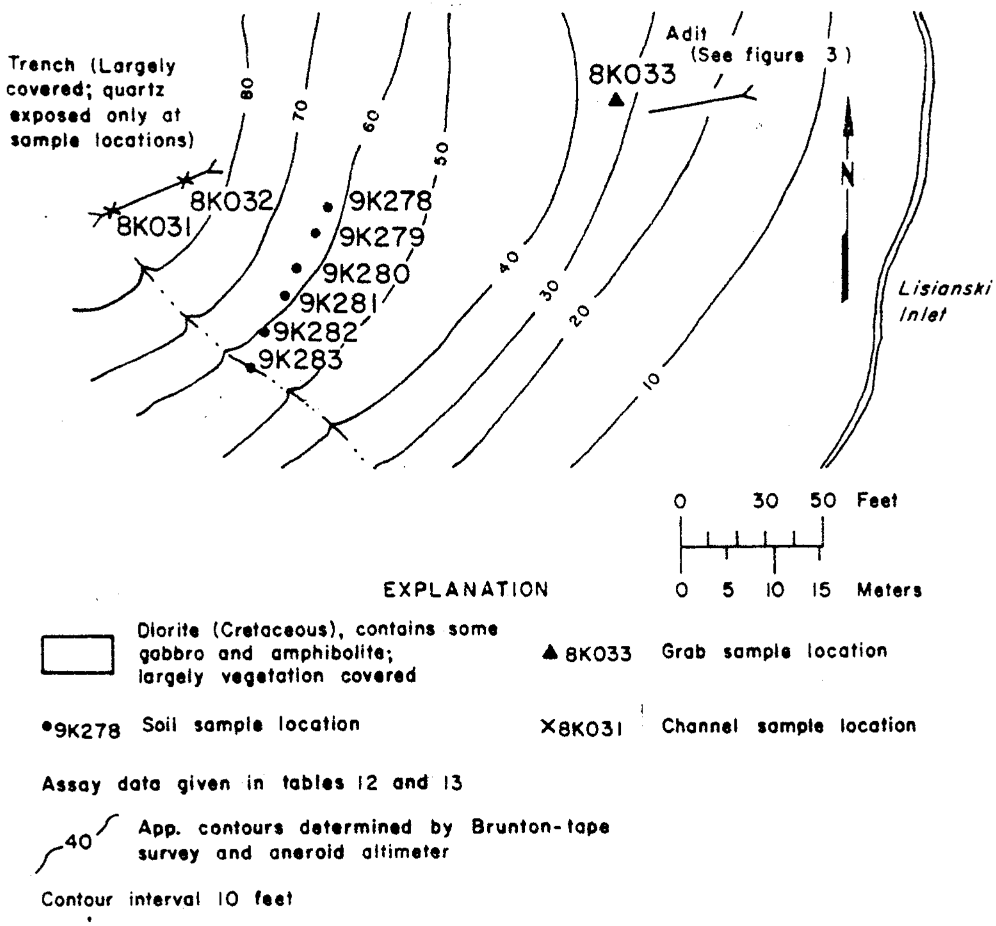


FIGURE 4. - Bon Tara Prospect, trench and soil sample location

the projected strike of the vein to the seaward may be worthwhile.

Goldwin Prospect

Gold has been recovered in small unrecorded quantities from gold-bearing quartz veins in a steep, unnamed drainage entering the west side of Lisianski Inlet about four miles northwest of Pelican (plate 1). Ten Paramont lode claims were located in 1920. Since then, the prospect has been re-staked several times and the reoccurrence of some of the locator names in the records suggests that the staking history is more complex than mining records show. The prospect has been known by various names the most prominent of which are Paramont, Goldwan and Goldwin. Six current Goldwin claims were recorded by D. MacDonald, S. Beadle, and R. Roundtree in 1972.

A 240 foot drift has been driven on a quartz vein in a fault zone on the west side of the stream at the 200 foot elevation and about 800 feet upstream from its mouth. The remains of a 30 inch Pelton wheel, compressor, pump and small generator are situated near the portal. A surface tram, now in ruins, once connected the workings with the beach on Lisianski Inlet just west of the mouth of the stream.

Rossman (1959) described three other quartz veins higher in the drainage at elevations between 1,000 and 1,500 feet. Two of these are in cliffs on the east side of the gully containing the stream. He reported that one of these, locally known as the blanket vein, at about 1,400 feet in elevation carried free gold, and that rich specimens had been found at the base of the cliff below the vein. He reported that he found no gold associated with the other vein on the west wall of the gully although he searched for it. He indicated that surface mining of high grade material had occurred in the late 1930's on a third vein in a west side tributary gully where the vein with a strike of N70°E was exposed intermittently along a fault for about 50 feet. He reported collecting a sample representative of a 6 inch thick pyritic quartz vein section that assayed 69 ounces gold per ton. Three other representative samples were obtained nearby. One taken across a 7 inch width of the same vein beyond the pyritic section assayed 0.11 ounce gold per ton, and two 10 inch samples of altered wall rock on either side of the vein and normal to it ran a trace and 0.05 ounce gold per ton.

During the present investigation the workings on the lower quartz vein at the 200 foot elevation were mapped and sampled. This vein strikes N20°E and dips 25 to 60° NW, and has been explored by drifting for more than 240 feet. The vein occurs in a fault zone, ranges in thickness from less than 0.2 to 1.4 feet and in places contains chloritic banding parallel to the altered diorite walls. The vein is calcareous near the face. Assays of 14 samples gave nil to 0.14 ounce gold per ton across measured widths of 0.2 to 1.4 feet (figure 5 and table 14). A sample of an angular quartz boulder or block from a short distance up stream below a falls assayed nil gold. The quartz was very angular and probably had a nearby source. Claims are considered active, however no recent production has been reported.

Koby Prospect

The Koby prospect is located 1.5 miles southeast of the head of Lisianski Inlet on the east side of a stream flowing north into Lisianski River (plate 1). Sulfide bearing quartz bodies with associated gold and

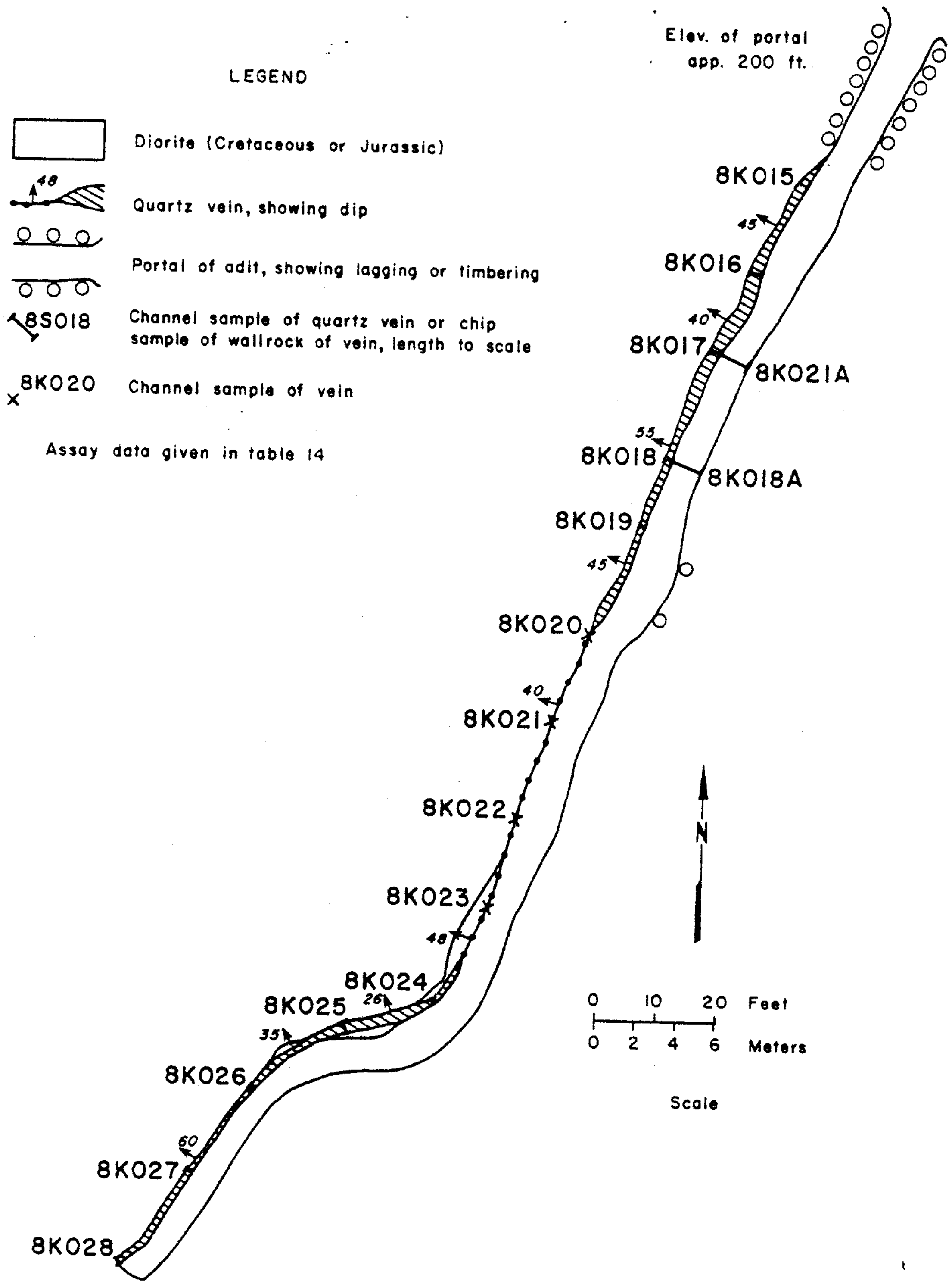


FIGURE 5. - Goldwin adit, sample locations

TABLE 14. Assay data, Goldwin adit

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis Oz./Ton Fire Assay Au	Analysis Oz./Ton Fire Assay Ag	Description
			Adit			
8K015	Channel	0.8	24	0.14	Tr	Quartz calcite vein
8K016	do.	1.4	43	0.02	Tr	Quartz vein
8K017	do.	0.8	24	0.01	Tr	do.
8K018	do.	0.7	21	Nil	Nil	do.
8K018A	Chip	4.9	149	Nil	0.1	Altered diorite on footwall above vein
8K019	Channel	0.9	27	Nil	Nil	Quartz vein
8K020	do.	0.4	12	.06	Tr	do.
8K021	do.	0.3	9	Nil	Nil	do.
8K021A	Chip	3.6	110	Nil	0.1	Altered diorite on footwall above vein
8K022	Channel	0.2	6	Nil	Nil	Quartz vein with partings of altered diorite
8K023	do.	0.4	12	Nil	Nil	do.
8K024	do.	0.9	27	Nil	Nil	Sparsely iron-stained quartz vein with partings of altered diorite
8K025	do.	0.8	24	Nil	Nil	Quartz vein somewhat fractured
8K026	do.	0.7	21	Nil	0.1	do.
8K027	do.	0.4	12	Nil	Nil	do.
8K028	do.	0.7	21	Nil	0.1	do.
			Stream float			
8K034	Grab	-	-	Nil	0.1	Sparsely iron-stained quartz block, somewhat fractured

silver occur in a fault zone in schistose greenstone, and have been explored by a series of open cuts and 300 feet of underground workings according to old reports. Surface and underground workings were inaccessible in 1978, however select grab samples obtained at that time from a dump gave high gold, silver, lead, copper and bismuth assays. No production is recorded.

Eleven Lucky Strike lode claims were located by Jack Koby in 1933 after finding large gold bearing quartz boulders near the 100 foot elevation in the stream. By 1936 several cuts had been opened well above the stream revealing a series of sulfide bearing quartz bodies in a steeply dipping northwesterly striking fault zone (Roehm, 1936). According to Roehm the large quartz boulders in the stream had very sharp angular edges suggesting they had not moved far. They contained pyrite, galena, and chalcopyrite and were speckled with gold. He also reported that the open cuts revealed the same characteristic quartz, mineralization, and gangue as the boulders, but little gold, and recommended that a crosscut be driven near the stream to the vein 70 feet below one of the open cut exposures.

In 1946, Rossman (1959) mapped surface and underground workings, which then consisted of a series of surface cuts opened along strike for 300 feet containing lenticular bodies of mineralized quartz up to 7 feet thick, and underground workings 70 feet below consisting of a 240 foot cross cut exposing several small faults containing some quartz and a 60 foot drift driven on an apparently unmineralized fault directly beneath open cut exposures. It isn't clear whether the mineral bearing structure exposed in open cuts was identified underground.

Several samples from surface cuts, credited to the Territorial Mine Inspector representing 3 to 6 foot widths yielded 0.02 ounce gold per ton and 0.5 to 0.9 ounce silver per ton, and probably were taken in the late 1930's before underground workings were driven, as no assays are reported of samples from underground (Information could not be further clarified).

In 1978 (present study) surface cuts were sloughed and working caved at the portal. Mineralized quartz was found on a dump, but was not found in place. Two select grab samples (8K035 and 8K036) of iron-stained sulfide bearing quartz assayed 1.06 and 2.96 ounces gold per ton, 27.6 and 52.5 ounces silver per ton, more than 1 percent lead, and more than 0.1 percent each of copper and bismuth (table 15). Cadmium was also reported. The samples were mostly composed of quartz but also contained pyrite, chalcopyrite, galena, and traces of goethite.

Although large outcrops are distributed along the stream, bedrock is covered by overburden along strike and elsewhere. Possible extensions of the mineralized zone or similar zones might be detected by soil geochemistry considering the metal assemblage present in the dump samples.

The non-continuous character of the quartz (vein?) in the fault zone at the Koby prospect described in previous reports, may have been caused by drag during post mineral movement on the fault or by minor differential slips on en-echelon cross faults. The fault at the prospect strikes at small angle to the Peril Strait fault, and the body of greenstone containing it probably lies wholly within the Peril Strait fault zone.

Cobol - Mine Mountain Mine

A gold quartz vein on the northwest slope of Mine Mountain was mined

TABLE 15. Assay data, Koby prospect

				Analysis									
				PPM							Oz/Ton		
		Sample Length		Spec	Spec	Spec	Spec	AAS	AAS	AAS	Fire Assay		
Sample	Type	Feet	(M)	Ag	Bi	Cd	W	Au	Cu	Pb	Au	Ag	Description
8K035	Select Grab	-	-	1500	G[1] 1000	20	L	28	2800	12,000	2.96	52.4	Quartz with chalcopyrite, galena & pyrite
8K036	do.	-	-	3000	G[1] 1000	30	L	62	1000	19,000	1.06	27.6	Quartz with chalcopyrite & galena
8K037	Spaced Chip .75 interval	6.6	2	2	N	N	N	N	140	45	-	-	Iron-stained chlorite schist

1/ G = Greater than

in the 1930's (plate 1 and figure 6). The vein was discovered in 1921, and in 1922 and 1923 the claims were bonded to the Pinta Bay Mining Co. who constructed a light duty rail tramway from the head of Goulding Harbor to the claims four miles to the north (Reed and Coats, 1941). Buddington (1925) visited the claims in 1923 while the tramway was being built and reported that surface trenching had exposed more than 200 feet of vein length over a vertical distance of 50 feet. The claims later reverted to the owners, who installed a Gibson mill in 1933. The mill was operated for parts of 1933, 1934 and 1935 seasons and was removed with other equipment from the property in 1936. About $3,500 in gold was reported to have been recovered from 135 tons of ore milled. On this basis recorded production is between 100 and 150 ounces of gold.

During this study a brief reconnaissance of the property was made in 1978, and the underground workings were sampled and mapped in 1979 (plate 7 shows the workings and table 16 gives sample assay results).

The gold bearing quartz vein was stoped for about 70 feet along strike where it occurred in dioritic rocks, however 80 feet of narrower extremities and non-contiguous sections in greenstone along the drift in both directions were not mined. The dip of the vein in the stopes averages 45 to 50 degrees and the vein has been stoped for an estimated 40 feet up dip. Bureau of Mines assays of samples cut in the drift in the vicinity of the stoped section range from nil to 2.45 ounces gold per ton across widths ranging from 0.2 to 1.2 feet. Assay analyses of samples taken on narrower portions of the vein range from nil to 0.145 ounce gold per ton for 0.05 to 0.7 foot widths.

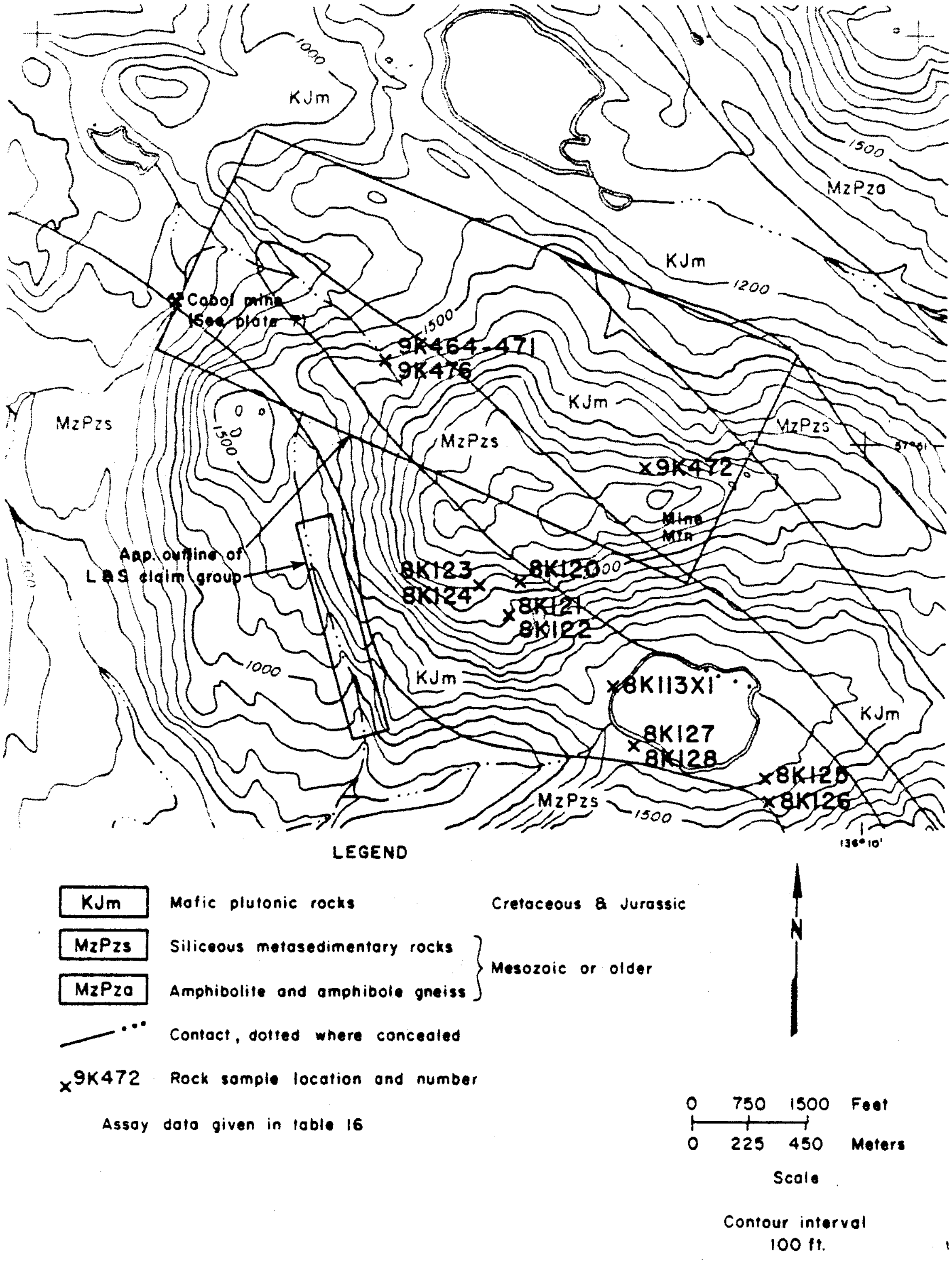


FIGURE 6. - Mine Mountain and vicinity, sample locations (Geology adapted from Johnson and Karl, 1982)

TABLE 16. Assay data, Cobol mine and vicinity

Sample	Type	Sample Length		Analysis								Description
				Oz/Ton		Part per million						
				Fire Assay		AAS	AAS	AAS	Spec	Spec	Colorimetric	
		Feet	(Cm)	Au	Ag	Au	Cu	Zn	As	Ag	WO_3	
Cobol adit												
9K404	Channel	0.8	24	0.025	Tr	1.1	L	10	1000	N	–	Iron stained quartz vein
9K405	do.	1.2	37	0.025	Tr	4.7	5	5	1500	1	–	do.
9K406	do.	0.8	24	N	Nil	L	5	5	500	N	–	Quartz vein
9K407	do.	0.5	15	1.53	0.4	48	20	10	10000	1	–	Iron stained quartz vein with arsenopyrite
9K408A	do.	0.3	9	0.32	Tr	13	10	565	1500	N	–	Quartz vein
9K408B	do.	0.3	9	0.02	Tr	0.4	15	25	N	N	–	Aplite dike
9K409	do.	0.2	6	2.45	0.6	100	45	100	3000	3	–	Quartz vein
9K410	do.	0.4	12	0.19	Tr	6.0	20	20	5000	N	–	do.
9K411	do.	0.4	12	0.20	0.1	6.0	60	60	1500	N	–	do.
9K412	do.	0.3	9	0.145	Tr	4.5	30	125	2000	N	–	do.
9K413	do.	0.3	9	2.29	0.5	1.2	20	115	10,000	1	–	do.
9K414	do.	0.4	12	0.035	Tr	60	20	10	700	N	–	do.
9K415	do.	0.6	18	N	Nil	L	175	90	N	N	–	Iron stained zone at contact between greenstone and diorite dike
9K416	do.	0.6	18	0.065	Tr	3.7	10	10	2000	N	–	Quartz vein
9K417	do.	0.6	18	0.02	Tr	6.8	10	5	1000	N	–	do.
9K418	do.	0.7	21	N	Nil	0.2	10	5	1000	N	–	Platey quartz vein
9K419	do.	0.2	6	0.01	Tr	L	10	5	1000	N	–	do.

TABLE 16. Assay data, Cobol mine and vicinity (cont.)

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis Oz/Ton Fire Assay Au	Analysis Oz/Ton Fire Assay Ag	Part per million AAS Au	Part per million AAS Cu	Part per million AAS Zn	Part per million Spec As	Part per million Spec Ag	Part per million Colorimetric WO_3	Description
Coulee southeast of adit												
9K464	Channel	1.5	46	Nil	0.1	0.14	197	50	-	N	5	Hanging wall of vein altered dorite with pyrite cubes
9K465	do.	0.5	15	0.01	Tr	0.08	3	4	-	N	10	Quartz vein with goethite stringers
9K466	do.	1.4	43	0.01	Tr	0.24	28	51	-	N	5	Footwall of vein-altered diorite with pyrite cubes
9K467	Select Grab	-	-	0.08	.1	0.06	5	3	-	N	<5	Iron-stained quartz float with pyrite
9K468	Channel	1.4	43	0.09	.1	0.12	51	52	-	N	<5	Hanging wall of vein-altered diorite with pyrite cubes
9K469	do.	0.7	21	0.01	Tr	2.8	2	14	-	N	8	Quartz vein with goethite stringers
9K470	Channel	2.9	88	0.01	Tr	0.28	46	59	-	N	<5	Footwall of vein-altered diorite with pyrite cubes
9K471	Select Grab	-	-	0.01	Tr	0.66	94	98	-	N	15	Altered diorite float
9K476	Channel	0.3	0.9	0.01	0.01	0.24	3	6	-	N	378	Iron-stained quartz vein with sulfides
Mine Mountain summit												
9K472	Composite Grab	-	-	Nil	Nil	0.04	18	37	-	N	5	Iron-stained aplite dike
8K120	Select Composite	-	-	-	-	0.10	2100	15	L	10	-	Quartz vein with marcasite
8K121	do.	-	-	-	-	N	660	80	N	N	-	Meta-andesite
8K122	do.	-	-	-	-	N	100	40	L	N	-	Meta-andesite and meta-diorite float with chalcopyrite and pyrrohoite
8K123	Composite Grab	-	-	-	-	0.30	690	70	N	0.2	-	Gossan and iron-stained amphibolite
8K124	Select Composite	-	-	-	-	0.15	460	10	N	N	-	Gossaniferous amphibolite

TABLE 16. Assay data, Cobol mine and vicinity (cont.)

				Analysis								
				Oz/Ton		Part per million						
		Sample Length		Fire Assay		AAS	AAS	AAS	Spec	Spec	Colorimetric	
Sample	Type	Feet	(Cm)	Au	Ag	Au	Cu	Zn	As	Ag	WO_3	Description
South Side of Mine Mountain Lake												
8K125	Composit Grab	–	–	–	–	N	790	20	N	N	–	Diorite gneiss float with disseminated pyrite
8K126	do.	–	–	–		N	15	40	N	N	–	Limestone (?)
8K127	Select Composit	–	–	–	–	N	140	80	N	N	–	Meta-andesite float with pyrite
8K128	do.	–	–	–	–	N	45	70	N	N	–	do.
8K113x	Select Grab											Greenstone or andesite dike with chalcopyrite, powellite pyrrhotite and sphalerite

Greenstone-diorite contacts seen in the drift suggest that the diorite mass narrows in the hanging wall. Shallow underhand stopes, water and rubble filled, have been dug sporadically for 35 feet along the vein in the diorite section, however, a full scale winze was not begun. Because of surface topography a lower drift to mine the vein downward in the diorite would have been impractical.

The drift intersects the vein about 70 feet from the portal. Vein rubble at the base of the mountain slope southwest of the portal and at nearly the same elevation is from the surface expression of the vein mined or from another vein locally following the same structure. The distribution of vein quartz in the workings suggests the latter.

The stope was not entered, but observations from the drift level indicate that the vein thickness in the back is similar to that in the drift. Information from observations by Buddington (1925) in 1923, and from the present study suggest that backs are thin and that little more than a protective crown pillar remains at the top of the stope. Comparison of stope geometry with topographic profile supports this.

Although Buddington (1925) reported other gold quartz veins in the vicinity in 1923, none was mined so far as known, at a time when nearby operating mines had established transportation and supply facilities, experienced miners were available and the rail tramway was new.

Samples were collected from eight sites in addition to the Cobol Mine in the Mine Mountain area. Figure 6 gives the locations of the sites on the west and south sides of Mine Mountain from which samples of quartz veins, iron stained zones, and other rocks were obtained during this study. Assays are reported in table 16. Chalcopyrite bearing float (sample 8K113X) was found in stream alluvium near the northwest corner of the unnamed lake a mile south of the summit of Mine Mountain. The source, although looked for, was not found.

Stag Bay Area

Reconnaissance of Stag Bay in 1978 to investigate persistent reports of gold quartz occurrences revealed two veins (plate 1). The first, a mile from the head of the bay on the south shore and on which an adit has been driven is known as the Stag Bay gold prospect or Brownie prospect. The second is half a mile beyond toward the mouth of the bay where the Brenda claim was staked in 1977.

A 70 foot drift at the Stag Bay gold prospect has been driven on a nearly vertical northwest striking quartz vein exposed on the beach 15 feet above high tide (figure 7). The portal was nearly hidden by vegetation in 1978. Two of 9 underground samples assayed 0.05 and 0.36 ounce gold per ton across 1.1 and 0.5 foot widths respectively, while the 7 others across widths of 0.2 to 3.1 feet yielded 0.01 ounce gold per ton or less (table 17). A sample taken across an 0.8 foot wide surface exposure of the vein near the portal assayed 0.24 ounce gold per ton. A channel sample obtained during an examination of this property in 1963 by a Bureau of Mines engineer was reported to contain 0.79 ounce gold per ton across a 1.2 foot wide vein on the east wall of the adit. The sample assayed 0.11 ounce silver per ton. Four other samples had gold assays <0.01 and 0.14 ounce per ton. Most samples contained a trace of tungsten.

Four channel samples obtained from the Brenda vein in 1978 contained nil gold and 0.1 ounce silver per ton (plate 1, figure 8, and table 18). A trace of tungsten was detected in three of the samples and one assayed 0.03 percent copper.

Three samples were obtained from other localities on the Stag Bay shore, one of a feldspathic dike (8K052) taken while in search of a

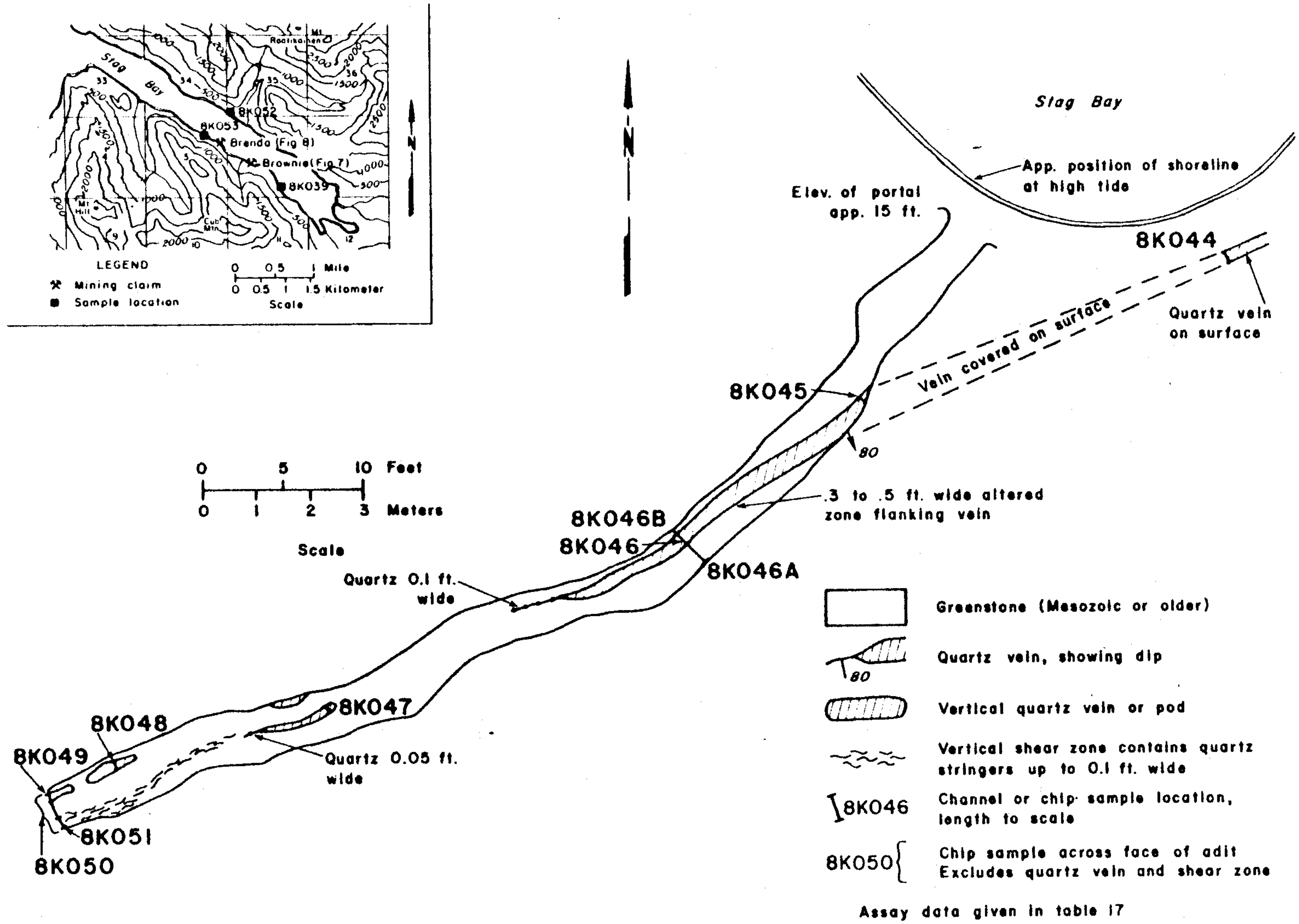


FIGURE 7. - Stag Bay gold prospect, sample locations

TABLE 17. Assay data, Stag Bay gold prospect (s. side)

Sample	Type	Sample Length Feet	Sample Length (Cm)	Analysis Oz./Ton Fire Assay Au	Analysis Oz./Ton Fire Assay Ag	Analysis PPM	Analysis PPM Spec As	Analysis PPM Spec W	Description
					Outcrop				
8K044	Channel	0.8	24	0.24	0.2		L	L	Quartz vein with pyrite
					Adit				
8K045	Channel	0.7	21	Nil	0.1		L	L	Quartz vein
8K046	do.	1.1	35	.05	0.1		300	L	do.
8K046A	Chip	1.8	54	.01	0.1		N	N	Greenstone on hanging wall above vein
8K046B	do.	1.0	30	Nil	0.1		N	L	Greenstone on footwall of above vein
8K047	Channel	0.6	18	0.01	0.1		500	L	Quartz pod
8K048	do.	0.5	16	0.36	0.2		500	L	Quartz vein
8K049	do.	0.4	12	0.01	0.1		L	L	do.
8K050	Chip	3.1	94	Nil	0.1		N	N	Greenstone with quartz stringers
8K051	Channel	0.2	5	0.01	0.1		500	N	Sheared greenstone

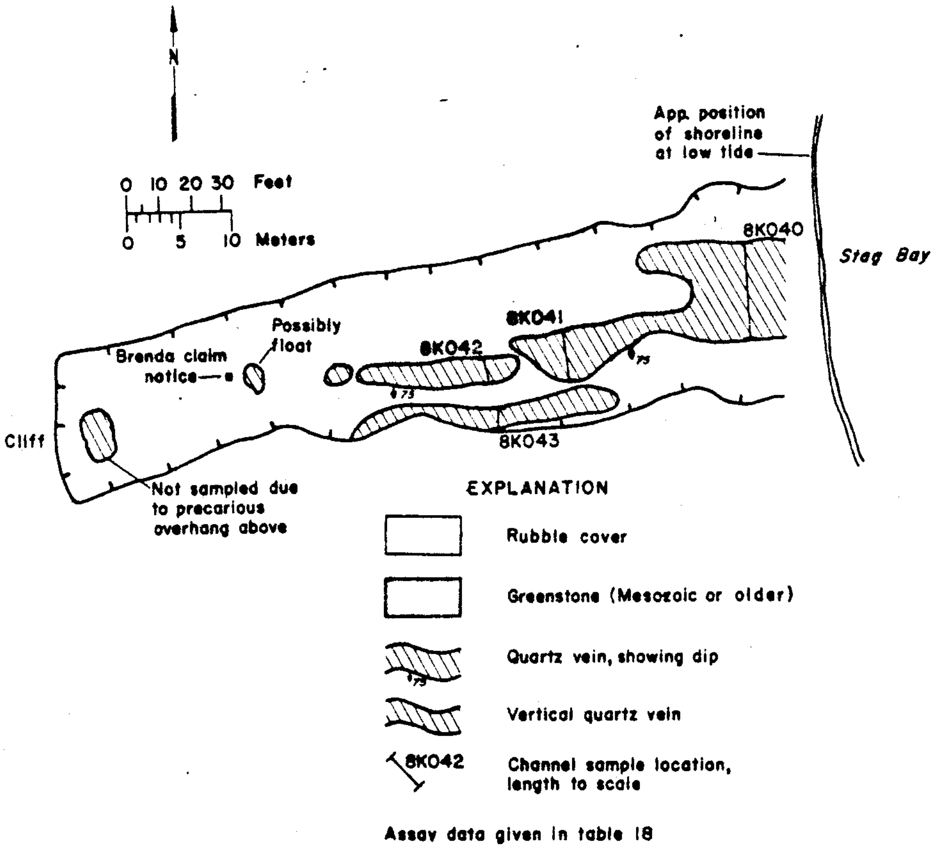


FIGURE 8. - Brenda vein, sample locations

TABLE 18. Assay data, Brenda vein

Sample	Type	Sample Length		Analysis					Description
				Oz./Ton		PPM			
				Fire Assay		AAS	Spec	Spec	
		Feet	(Cm)	Au	Ag	Cu	As	W	
8K040	Channel	3.9	118	Nil	0.1	50	N	N	Sparsely iron-stained quartz pod with pyrrhotite
8K041	do.	0.8	23	Nil	0.1	80	N	L	Sparsely iron-stained quartz vein
8K042	do.	0.9	26	Nil	0.1	140	N	L	Quartz vein with pyrite
8K043	do.	0.8	25	Nil	0.1	320	500	L	Quartz vein

quartz vein reported to be on the north shore and which was not found, and two samples on the south shore, one a grab sample of pyritic iron stained quartz rich float from the fan below a steep gully (8K053) contained 0.5 ppm silver and 300 ppm copper, and the other a 7 foot spaced chip of pyrrhotitic schist (8K039) contained 200 ppm copper and a trace of silver (table 19). No other important base or precious metal values were detected.

Stranger River

A placer claim named the Children's Garden #1 was staked in 1970 on Stranger River two miles east of the south entrance to Lisianski Strait (plate 1). The claim is believed to have been located at the mouth of the river. This drainage has no previous mining claim history, and no production is reported.

During the present study reconnaissance samples were taken near the river mouth on a flat or delta from just below the high tide line. One sample yielded measurable gold and a second sample yielded a trace of gold. No gold was detected in 12 other samples. Figure 9 gives sample locations and table 20 gives sample analyses. The samples were collected by shovel from shallow pits dug near the margins of the present stream channel. They were partially pan concentrated at the site from full pans containing more than 15 pounds each. The one numerical result is reported in ounces per cubic yard using a conversion of 160, 16 inch pans per cubic yard. The samples are random selections of finer sized material from among the cobbles and boulders. They do not represent the whole size range of material at any of the sample sites and so do not represent the material in the deposits on the flat as a whole.

TABLE 19. Assay data, Stag Bay

Sample	Type	Sample Length Feet	(M)	Analysis PPM AAS Au	AAS Cu	Description
8K039	Spaced Chip.5ft interval	7.2	2.2	N	130	Iron-stained sheared greenstone with pyrrohotite
8K052	Composit Grab	-	-	N	10	Quartz-albite vein in sheared greenstone
8K053	Grab	-	-	N	20	Iron-stained quartz

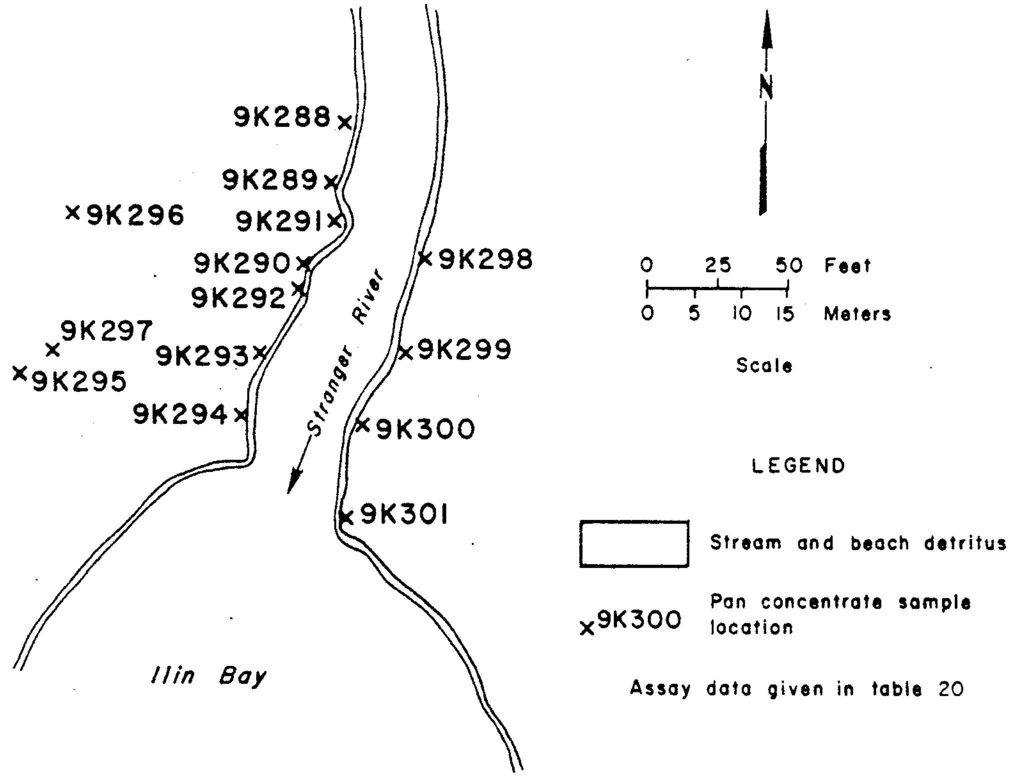


FIGURE 9. - Stranger River placer prospect, sample locations

Table 20. Assay data, Stranger River placer prospect

Sample	Type	Analysis Oz./Cu. Yd. Fire Assay Au	Analysis Oz./Cu. Yd. Fire Assay Ag
9K288	Pan Concentrate	N	N
9K289	do.	N	N
9K290	do.	N	N
9K291	do.	N	N
9K292	do.	N	N
9K293	do.	N	N
9K294	do.	N	N
9K295	do.	N	N
9K296	do.	N	N
9K297	do.	N	N
9K298	do.	N	N
9K299 2/	do.	N	N
9K300	do.	0.00005 1/	Tr
9K301	do.	Tr	Tr

1/ Calculated from mg total gold and pan to Cu. Yd. Conversion

2/ Sample contained 50 ppm W by spec analysis

The materials on the flat range in size from silt to large boulders and exhibit almost no obvious sorting. They were probably partly derived from glacial deposits. Natural concentrations of heavy material, such as gold, in extensive well defined zones or horizons appears to be unlikely.

The samples represent some small but undetermined quantity of selected fines. The sample results are indicators only and are considered only qualitative or possibly semi-quantitative at best. Because of the analytical procedures used more gold may be present than is reported in the table.

Deep Bay

Gold was found in stream sediment and bedrock samples taken during the present study in a small drainage area of less than one square mile on the north side of Deep Bay two miles from the mouth. Deep Bay is located on the west arm of Peril Strait near the southern end of the study area (plate 1). Reconnaissance by the Bureau of Mines in 1979 to investigate anomalous uranium reported in 1978 U.S. Geological Survey stream sediment concentrate and water samples from numerous sites throughout the southern half of the study area, yielded three gold bearing samples from this drainage. Two stream sediment samples (9K422 and 9K423) from adjacent tributaries to the small stream near sea level at the base of the steep mountainside north of Deep Bay yielded 12.0 and 0.1 ppm gold respectively. A 30 foot spaced chip sample across a granodiorite outcrop exposed by a slide about 200 feet above the stream, yielded a trace of gold. Twelve other stream sediment, bedrock, and float samples yielded no gold. They include samples of pegmatite and aplite dikes in granodiorite on the upper part of the mountain 1,500 feet above Deep Bay taken half a mile north of the stream samples but within the same 400 acre drainage area. Sample locations at Deep Bay are shown in figure 31, which is can be found in the section of this report titled Uranium investigation. The gold analyses are also reported in the same section (table 41).

The presence of gold in the samples from Deep Bay was not reported until after all project field work was over. The drainage basin was not re-examined. The characterization of the gold occurrences is not known.

The many northeasterly striking pegmatite and aplite dikes exposed on the mountain between elevations of 1,200 and 1,500 feet are probably in the upper outer shell or margin of the stock, and should be examined even though the uranium reconnaissance samples showed no gold to be present. Attention should also be given the possibility that roof pendants may occur nearby.

The rocks exposed in the slide near the 200 foot elevation have the composition of granodiorite to quartz monzonite. They are sericitically altered and appear to be epidotized. No quartz veins or other potential gold source rocks in or near the sample 9K421 section were seen although bedrock was well exposed. This area should be re-examined since gold sometimes occurs in extremely fine quartz veinlets along joints, fractures, and slips in stocks of this composition, and may comprise large, low-grade reserves.

Although perhaps a remote possibility at Deep Bay, the chance that such deposits may exist should not be overlooked.

Gold has not previously been reported in the Deep Bay area, and courthouse records show no evidence of mining claims having been located in the vicinity, nor anywhere within this Tertiary(?) granodiorite to diorite stock of 20 square miles in extent from which the samples were obtained.

A reference to underground workings on a gold-quartz vein in black slate at Deep Bay by Buddington (1925) probably alludes to an occurrence in Pinta Bay formerly known as Deep Bay, 30 miles to the northwest.

Nickel-Copper-Cobalt Occurrences

Gabbro-norite bodies of probable Tertiary age host nickel-copper-cobalt deposits at Bohemia Basin (Platinum-group metals are reported by Dahlin, Rule, and Brown, 1981) on east central Yakobi Island and at Mirror Harbor about 15 miles to the south on the west coast of Chichagof Island (plate 1). Deposits in both areas have been extensively explored and are covered by active claims. Gabbro-norite bodies are also known in the western part of Yakobi Island. Minor nickel-copper mineralization is associated with some of the western bodies, however no important nickel-copper-cobalt deposits are known in the western part. A small tonnage was removed from exploratory workings at Bohemia Basin and at Mirror Harbor, otherwise these deposits have not been mined.

Bohemia Basin

Nickel-copper-cobalt occurrences were discovered in Bohemia Basin on Yakobi Island in 1920, and the first mining claims were staked in that year. A total of 980 mining claims have been recorded in the vicinity since discovery. Currently there are 265 active unpatented claims and 9 patented claims.

Bohemia Basin is situated in the eastern part of Yakobi Island, one to two miles west of Lisianski Strait and four miles southwest of the junction of Lisianski Strait with Lisianski Inlet. The deposits are exposed between the 400 and 1,800 foot elevations at the head of Bohemia Creek, which flows east to Lisianski Strait.

The occurrences are thought to be magmatic segregations of immiscible sulfide phases in gabbro-norite bodies which are considered as parts of a post metamorphic composite stock (Kennedy and Walton, 1946). These gabbro-norites cover several square miles in the Bohemia Creek-Takanis Peak vicinity on east-central Yakobi Island, although only a small portion of this rock contains nickel and copper bearing sulfide mineralization (plate 8 and figure 10).

Exploration activity in the Bohemia Basin area has been extensive and has taken place over a period of 60 years. A tunnel was driven in the basin area shortly after the first claims were located in 1920 and by 1940 there were 15 prospect trenches from 30 to 150 feet long and a tunnel 166 feet long had been excavated according to Reed and Dorr (1942). They mapped the trenches and the geology of the basin area in detail in 1940. Their work was done under the World War II Strategic Minerals Program. Under the same program, East and Traver of the Bureau of Mines explored parts of what is now named the Basin ore body with 5,191 feet of diamond drilling between November 1941 and August 1942 (Traver, 1948). Gates, Kennedy, and Walton of the U.S. Geological Survey conducted geologic studies in the area in 1941 and 1942. Walton and Kennedy ran magnetometer surveys in 1943. The combined efforts of both agencies resulted in Bureau of Mines War Minerals Report 174 (1944), most results of which have been summarized in USGS Bulletin 947-C (Kennedy and Walton, 1946). The results of the geologic work, magnetometer surveys, and diamond drilling show that six mineralized bodies in the western part of Bohemia Basin are probably all portions of a single ore body having a generalized bowl shape and referred to as the Basin ore body. During the late 1950's

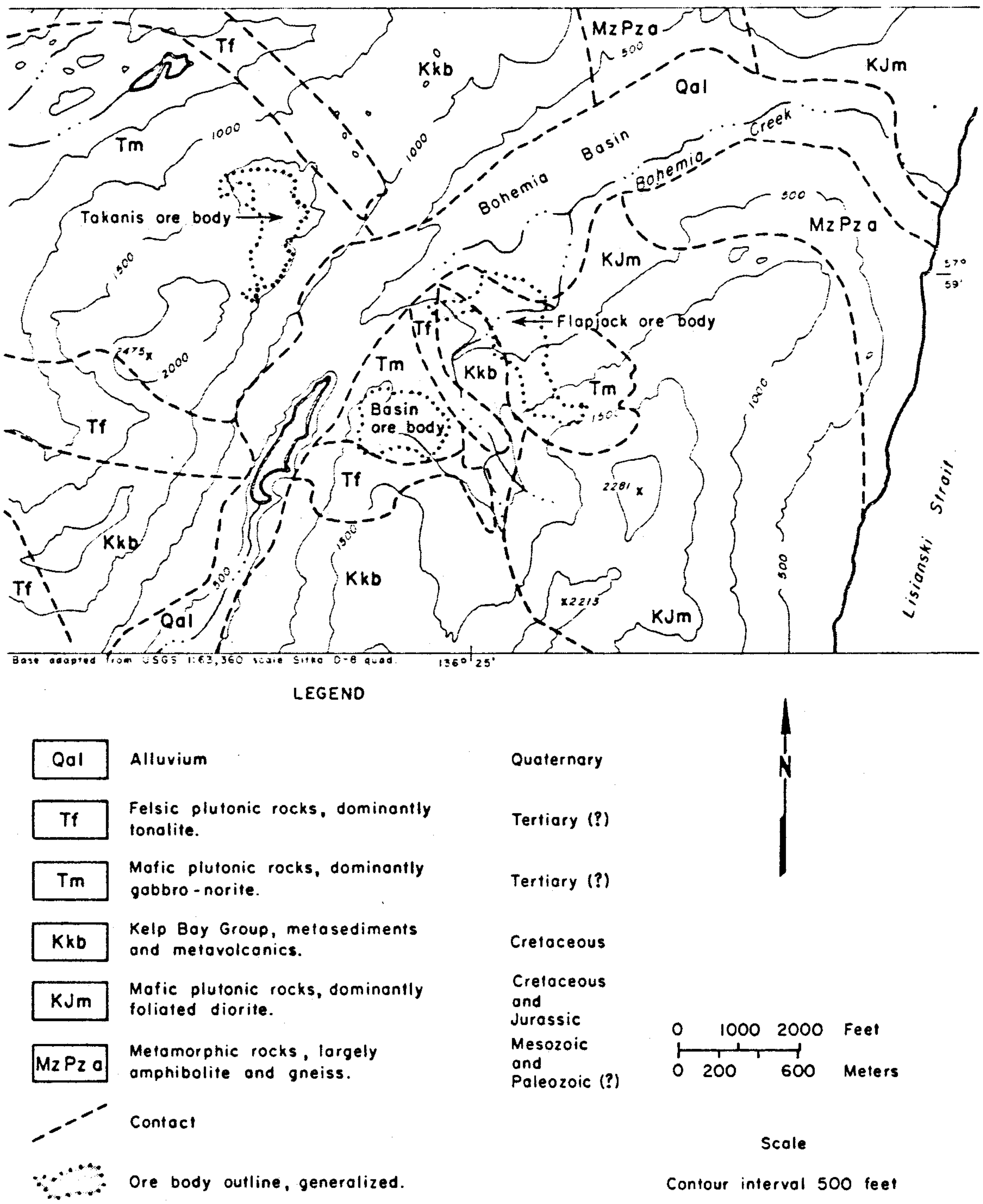


FIGURE 10. - Geologic map of Bohemia Basin area (Geology adapted from Johnson and Karl, 1982)

(mainly 1958) International Nickel Company diamond drilled 14,310 feet in the Basin ore body and slightly more than 2,000 feet in the Takanis area. Inspiration Development Company leased and assumed control of the Bohemia Basin deposits in 1972, according to a public release dated April 3, 1978 (Kuhn, 1978). Since 1972 Inspiration has actively explored the area in which three apparently separate deposits named the Basin, Takanis and Flapjack ore bodies have been partially delineated. Exploratory work has included geologic mapping; metallurgical testing; diamond core drilling of more than 30,000 feet of hole; geophysical surveys; construction of two camps, a warehouse, a dock, and several miles of road, the latter closely following the route used in 1941 and 1942 to move diamond drilling equipment between the beach and Bohemia Basin. Bohemia Basin is accessible from the beach over this road by 4 x 4 vehicle.

Nine mining claims were patented in 1979, two on the Takanis ore body and seven on the Basin deposit. Other claims have been surveyed for patent.

Reserves were announced by Inspiration Development Company in April of 1978. Additional exploratory work was conducted by the company during the three field seasons since that time. The two best known ore bodies, the Basin and Takanis bodies, are reported to contain at least 20,100,000 tons having a grade of 0.31 percent nickel, 0.18 percent copper, and 0.04 percent cobalt in measured and inferred catagories (Kuhn, 1978 and Thornsberry, 1980). A third body, the Flapjack, which is not included in the above tonnage figure, is incompletely delineated, but is considered by the owners to have a geologic reserve of approximately four million tons of mineralized rock.

The Basin body is elliptical in plan having dimensions of about 1,000 by 1,500 feet (figure 11). It occurs in layered mafic and ultramafic rocks and has a rough three dimensional elongate bowl shape combined with a central funnel shape. Figure 11 is an isometric drawing of the Basin ore body partly cut away to show its general shape and size.

The Takanis ore body is not thoroughly delineated in the down dip limits. This body is confined in a pyroxenite unit and is either two separate bodies or a single body faulted off. Depth continuation is considered to probably be very good and down dip limits are considered open ended (Thornsberry, 1980). This body is crudely tabular and has a steep south slope. The Flapjack body may be tabular in part and roughly parallel to the steep topographic surface where it is exposed, however, as it is incompletely drilled, this is not clear. Plate 8 shows the three bodies in plan as they are known.

Kennedy and Walton (1946) estimated the reserves in the Bohemia Basin-Takanis Peak area as a result of the work by the Bureau of Mines and U.S. Geological Survey under the Strategic Minerals Program in the early 1940's. Additional surface exploration and more than 45,000 feet of diamond drilling since that time have far more closely delineated the mineralized bodies. Although Kennedy and Walton estimated the reserves of 20,800,000 tons of 0.33 percent nickel and 0.21 percent copper, these reserves were in the "indicated" and "inferred" catagories, whereas the Inspiration figures of tonnage and grade which are similar to those of Kennedy and Walton, are in "measured" and "inferred" catagories. The reserve estimates of Kennedy and Walton employ the terms "inferred" and "indicated" slightly differently than they were used by the Bureau of

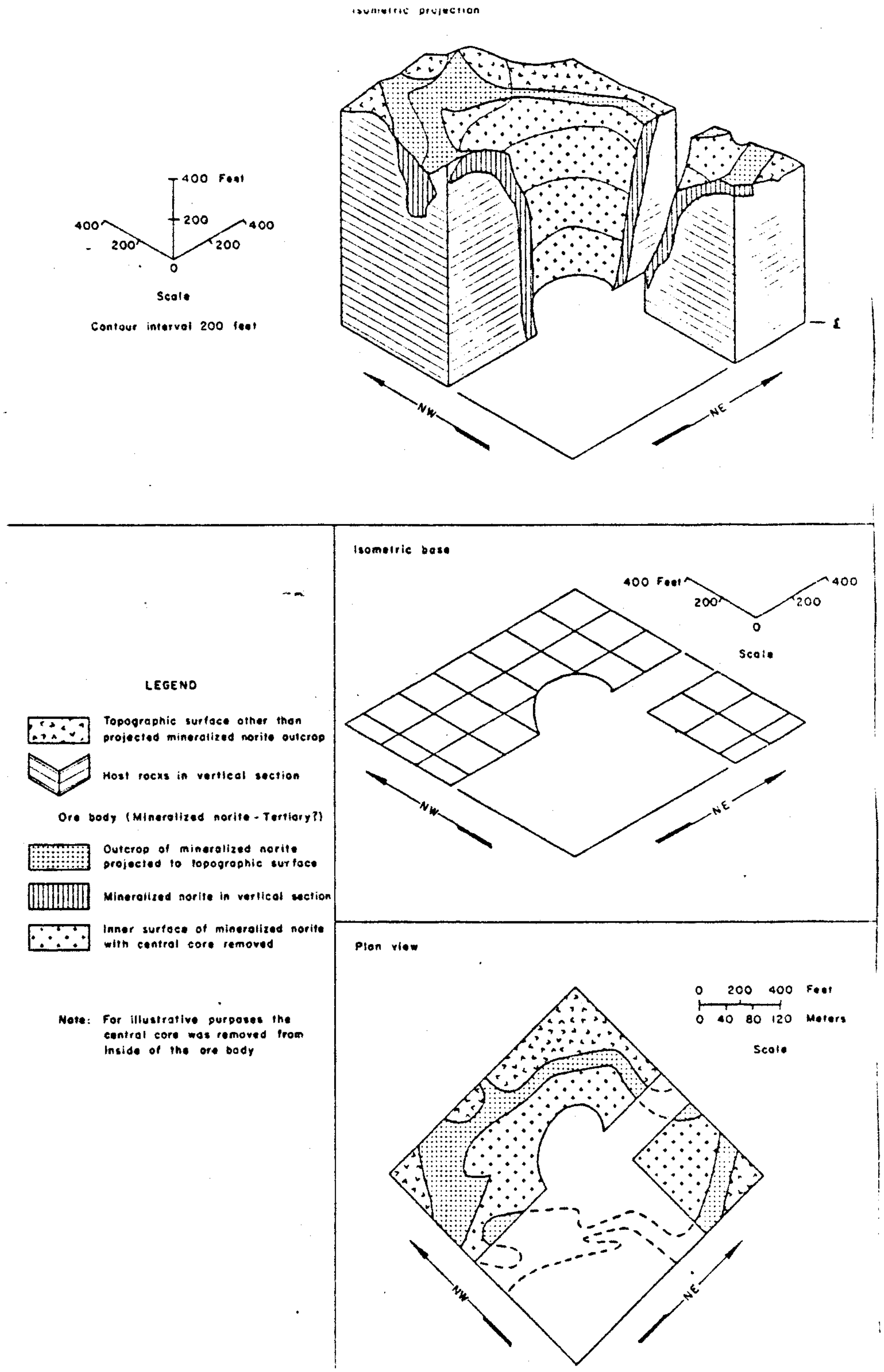


FIGURE 11.- Isometric diagram of the Basin ore body, Bohemia Basin (constructed by K. Weir and C.W. Merrill, Jr. from data loaned by Inspiration Development Co.)

Mines (War Minerals Report 174, 1944) in calculating a portion of the same reserves.

The Bohemia Basin deposits have not been mined and comprise known nickel-copper-cobalt reserves, and a distinct potential for further reserves of similar material as the deposits are not completely delineated.

Mirror Harbor

Nickel-copper-cobalt occurrences were discovered near Mirror Harbor on northwestern Chichagof Island in 1911 (plate 1). The first mining claims were located that year. Since discovery 330 claims have been recorded, with 114 claims now current. The deposits are thought to be magmatic segregations of sulfide minerals mainly pyrrhotite, pentlandite and chalcopyrite in gabbro-norite bodies within a larger dioritic stock. The gabbro-norites are intermittently exposed over an area of less than one square mile in the Mirror Harbor - Davison Bay area. Three separate deposits are known. Their localities are shown in figure 12. Two of the deposits contain massive sulfides and the third has been referred to in literature as a disseminated sulfide deposit.

In 1915 a 175 foot shaft was sunk on the largest of the two massive sulfide deposits near the beach on the northern tip of Fleming Island. Massive sulfides occur at the surface and have been reported in crosscuts 75 feet and 175 feet below the surface. The shaft is flooded to within 6 feet of the collar which is estimated to be about 10-12 feet above high tide.

During World War II the Strategic Minerals Program was responsible for examining the Mirror Harbor deposits and drilling 1,267 feet of

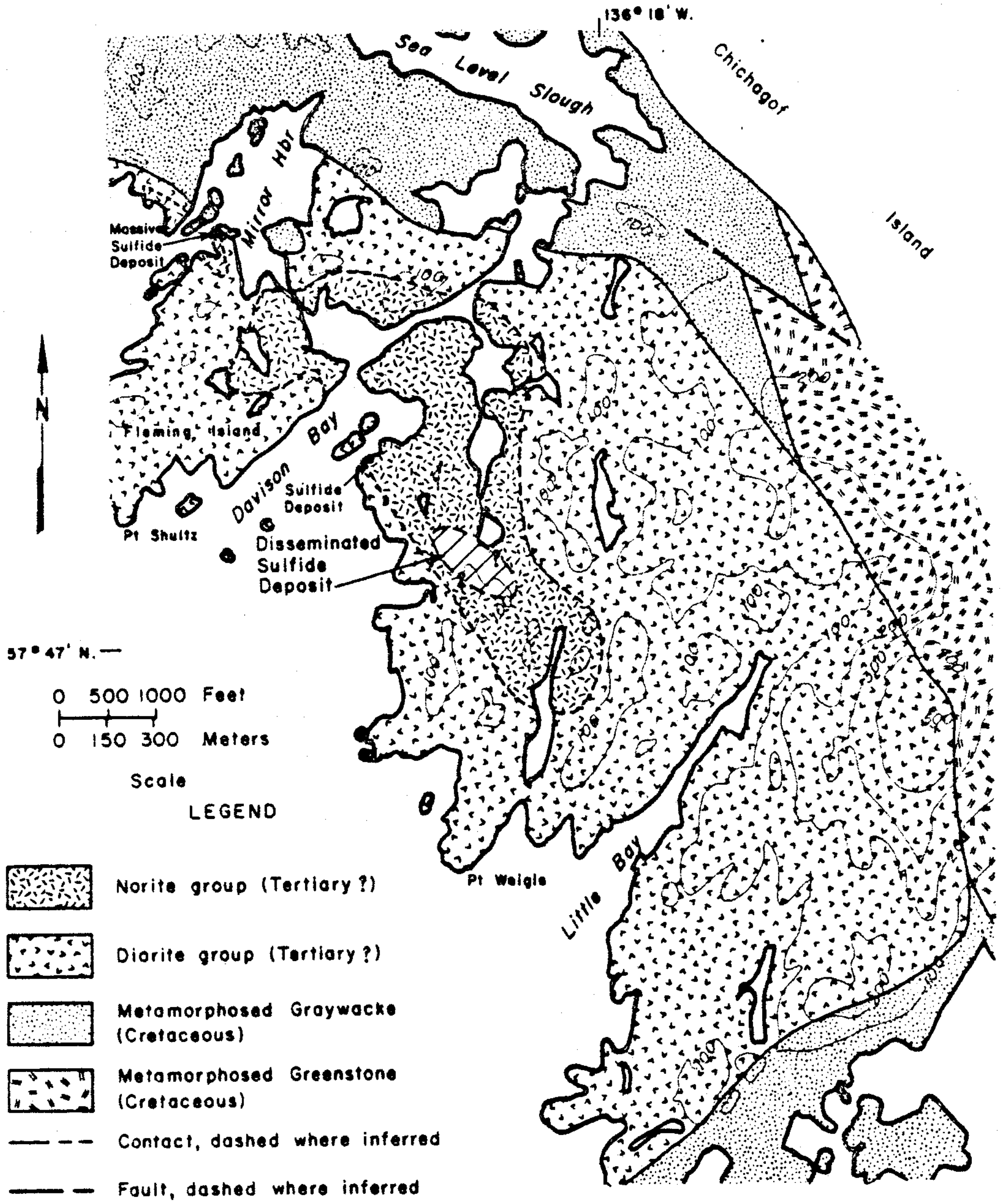


FIGURE 12. - Geologic map of Mirror Harbor area (modified from USGS Bull. 936, Plate 36)

diamond drill hole (Traver, 1948, Pecora, 1942, War Minerals Report 333, 1945, and Kennedy and Walton, 1946). The drilling was done by the Bureau of Mines in 1942 in conjunction with geologic work done by the U.S. Geological Survey the previous year. Five holes were drilled to better delineate the body explored by the shaft on Fleming Island. This deposit is considered pipelike and probably to be displaced by a fault between the crosscuts. About 7,300 tons of 1.605 percent nickel and 0.99 percent copper are reported by the Bureau of Mines in War Mineral Report No. 333, (1945). Kennedy and Walton (1946) reported about 8,000 tons of 1.57 percent nickel and 0.88 percent copper.

Two diamond drill holes were drilled in 1942 on the second massive sulfide body on the east shore of Davison Bay. This body is considered well delineated and to contain no more than a few tons of massive sulfide rock exposed at the surface having a slightly lower grade than that on Fleming Island.

The disseminated sulfide deposit 1,500 feet southeast of Davison Bay was surface sampled by Pecora in 1941 in a series of 34 trenches dug by the owners, and followed by further geologic work by the U.S. Geological Survey in 1942 (Kennedy and Walton, 1946). A single diamond drill hole by the Bureau of Mines explored what was considered to be a representative portion of this body in 1942 (Traver, 1948). From the surface sampling and from this diamond core drilling this deposit was estimated to contain 900,000 tons of 0.172 percent nickel and 0.049 percent copper (War Minerals Report 333, 1945).

Inspiration Development Company now controls the Mirror Harbor deposits and has conducted extensive mapping, sampling, and geochemical and geophysical surveys since 1972. Of 11 diamond drill holes drilled, 7 holes with intercepts of nickel, copper, and cobalt similar to Bohemia Basin in grade, define a mineralized zone in a layered mafic type of deposit (the so-called "disseminated deposit") that is fairly continuous as far as it has been explored (Thornsberry, 1980).

Squid Bay - Lost Cove

Over a period of more than 50 years a dozen groups of mining claims have been located near the south entrance to Lisianski Strait, mostly on southwestern Yakobi Island where although dioritic rocks are dominant, some gabbro-norites occur (plate 1 and figure 13). None of these claims is now active.

Copper assay values up to 0.13 percent and nickel values up to 0.03 percent were obtained from pyrrhotitic gabbroic rocks in a small localized shear zone on the east side of Lost Cove on the Chichagof Island side of Lisianski Strait during this study, while similar rocks on Yakobi Island near the southeastern entrance to Squid Bay carried a narrow lenticular zone containing pyrrhotite and chalcopyrite. A composite grab sample assayed 0.38 percent copper and 0.05 percent nickel with significant amounts of silver, cobalt, and chromium (table 21).

Such areas have long attracted attention because of the possibility that nickel-copper-cobalt deposits similar to those at Bohemia Basin and Mirror Harbor may occur where the rocks are of gabbro to norite composition. In general the gabbro-norites seen in this vicinity have been devoid of sulfide minerals except for zones such as those noted above.

Copper Occurrences

Copper mineralization occurs in several geological settings within the area studied, in addition to its association with nickel in noritic

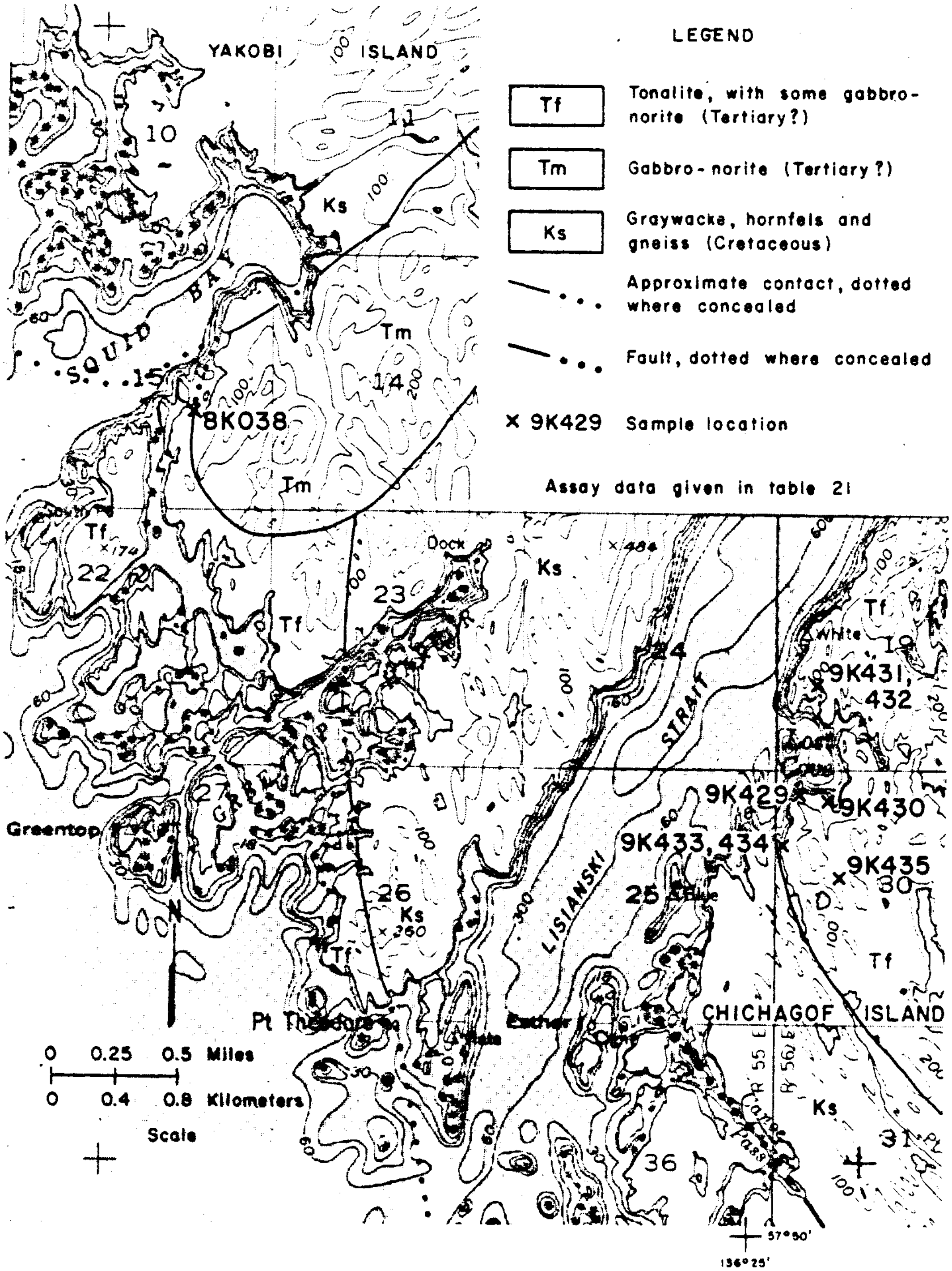


FIGURE 13. - Squid Bay - Lost Cove area, sample locations
(Geology from Johnson and Karl, 1982)

TABLE 21. Assay data, Lost Cove, Squid Bay

Sample	Type	Analysis PPM AAS Cu	Spec Co	Spec Ni	Spec Cr	Description
9K429	Select Grab	1300	100	300	-	Iron-stained zone in gabbro norite with sulfides
9K430	do.	327	50	200	-	do.
9K431	do.	40	30	50	-	do.
9K432	do.	650	150	150	-	do.
9K433	do.	60	20	50	-	do.
9K434	Stream sediment	50	30	30	-	Drainage follows gabbro-norite / graywacke contact
9K435	Composite Grab	30	10	5	-	Mafic to ultamafic fine-grained rocks

Squid Bay

8K038[1]	Composite Grab	3800	100	500	300	Small pod of sulfide bearing gabbro-norite

1/ Sample contained 5 ppm Ag by spec analysis rocks. The Mt. Baker copper deposit, possibly the most extensive, is situated in Triassic Goon Dip Greenstone near younger and conformable Whitestripe Marble. The Cable showing occurs in a fault zone in Mesozoic and Paleozoic(?) calcareous metamorphics near their contact with intrusive rocks. Copper occurs elsewhere within Goon Dip Greenstone largely in geochemical traces some of which are geochemically anomalous and primarily indicate high geochemical background in copper. Small copper bearing skarn deposits in dioritic rocks near greenstone contacts occur south of Stag Bay in association with magnetite. Copper also occurs in small skarn zones in Cretaceous graywackes on the coast to the southwest.

Mt. Baker Copper Prospect

A well mineralized copper bearing zone on Mt. Baker 1.5 miles north of Goulding Harbor occurs in Triassic Goon Dip greenstone volcanics a few hundred feet from their contact with younger conformable Triassic Whitestripe marble (plate 1 and figure 14). Lesser copper is associated with local dikes, shears, and limestone lenses in the greenstone. A mile long magnetic anomaly may trace a projection of the structure with which the concentrations of copper minerals are associated. No production is recorded. Fifty-five lode claims were active in 1978.

Copper was discovered near the summit of Mt. Baker in 1907. When Overbeck (1919) visited the property in 1917 in connection with war minerals investigations of copper (and nickel) deposits, several trenches and more than 300 feet of underground workings had been opened northwest of the peak between the elevations 1,300 and 2,000 feet.

A chalcopyritic altered zone exposed in open cuts near the 1,900 foot elevation yielded high copper assays in 1953 when workings were reopened,

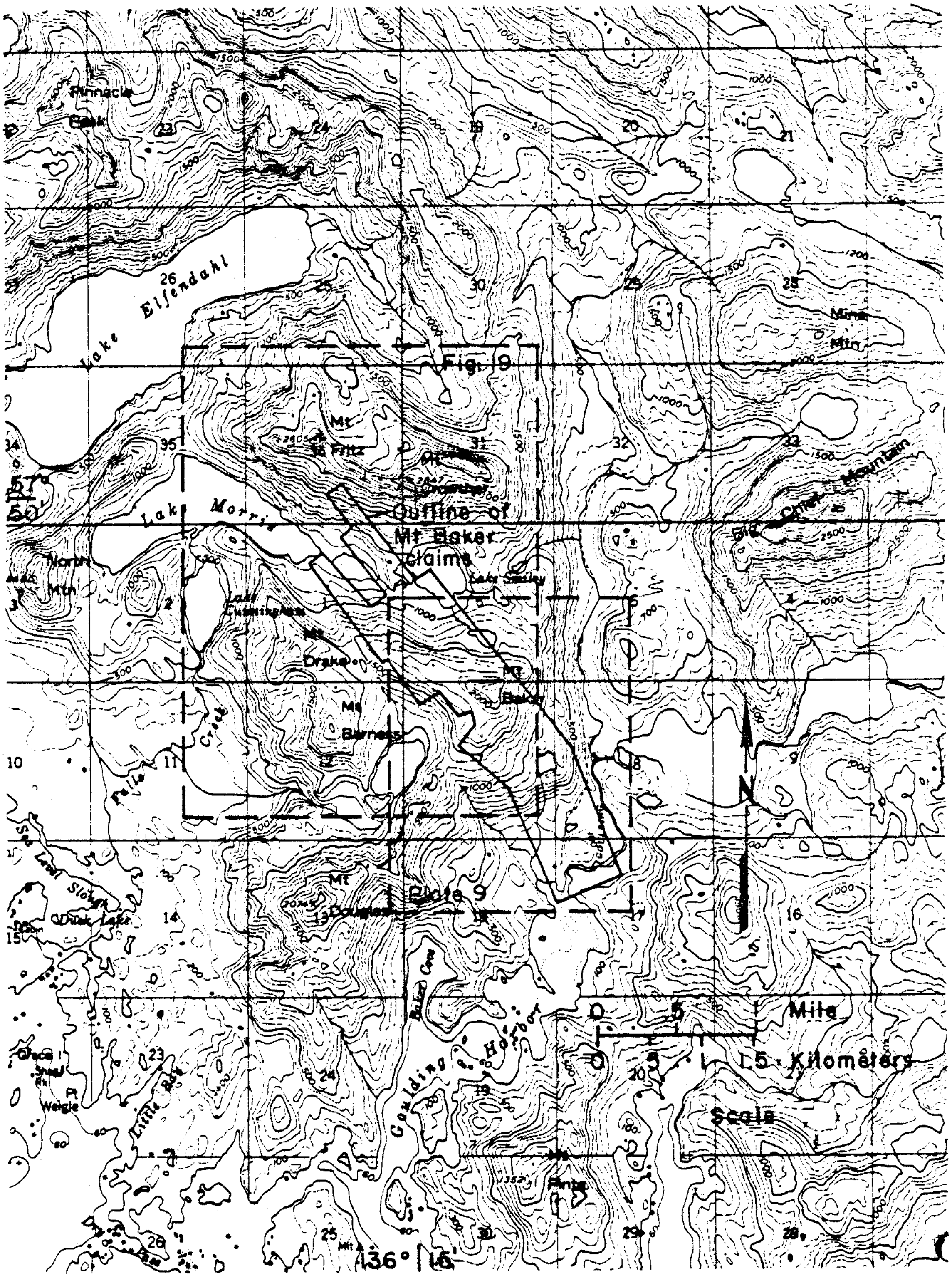


FIGURE 14. - Index map of Mt. Baker area (Base from USGS 1:63,360 scale Sitka D-7 quad.)

extended and sampled by the U.S. Bureau of Mines (Thorne, 1960). A trench (#1) near the southeastern end of known copper mineralization exposed 2.0 percent copper across a 13 foot width and a shallow shaft (trench #5) nearly 300 feet to the northwest showed 7.52 percent copper across a 2.0 foot width. These sections also yielded 0.87 and 2.85 ounces silver per ton, and a trace, and 0.01 ounce gold per ton respectively. Locations of samples are shown on plates 9 and 10, and figures 15, 16, 17 and 18, and sample assays are given in table 22, 23, 24, 25, 26 and 27. One of two samples taken in 1953 from a short drift driven from a crosscut whose portal at 1,875 foot elevation is 60 feet beneath the trenches, assayed 1.10 percent copper across a 3.0 foot width. Although copper mineralization was encountered in four of the five numbered trenches it was not reported in trench No. 4, 60 feet northwest of the drift sample site. An approximate strike of N40°W and a nearly vertical dip are indicated by the alignment of trenches along structure and the respective position of the sample site in the drift beneath.

A 5 foot adit 250 feet to the east crosscutting a narrow shear zone in heavily iron-stained pyritic greenstone yielded lesser copper and silver assays but higher gold values. Assays yielded up to 0.24 percent copper across a 2.0 foot width, up to 0.35 ounce silver per ton across 1.5 feet and 0.25 ounce gold per ton across an 0.8 foot width. A high grade grab sample yielded 1.6 percent copper with 0.97 ounce silver per ton. The adit driven south crosscuts a vertical west striking shear and gouge zone in pyritic greenstone. Assays of samples 9K495-499 cut along the west wall are given in table 25.

A soil sample survey (106 samples in 4 lines) conducted by the Bureau of Mines in 1953 to locate a possible northwesterly extension of

TABLE 22. Assay data, Mt. Baker prospect, Workings on NW side of peak 1953 USBM samples (Thorne)

		Analysis					
		Sample Length.		Percent Wet Chemical	Oz./Ton Fire Assay		
Sample	Type	Feet	Cm	Cu	Au	Ag	Description
B-1	Channel	2.0	61	0.1	Tr	Nil	Hanging wall trench No. 1
B-2	do.	5.0	152	1.0	Nil	0.48	Vein, trench No. 1
B-3	do.	5.0	152	2.3	0.01	1.28	do.
B-4	do.	3.0	91	3.38	Tr	0.85	do.
B-5	do.	5.0	152	0.32	Nil	0.11	Footwall, trench No. 1
B-9	do.	5.0	152	0.27	Tr	0.10	Hanging wall,trench No. 2
B-11	do.	0.8	24	0.40	Tr	0.15	Vein, trench No. 2
B-6	do.	0.9	27	2.77	Tr	1.62	do.
B-7	do.	1.5	46	2.4	Nil	1.04	do.
B-8	do.	5.0	152	0.27	Tr	0.54	Footwall, trench No. 2
B-10	do.	4.0	122	0.05	Tr	Nil	Trench No. 3
B-12	do.	2.0	61	7.52	0.01	2.85	Vein, trench No. 5
B-14	do.	3.0	91	1.10	Tr	0.63	Adit drift in back
B-15	do.	1.7	52	0.78	Tr	0.27	Adit drift 15 ft. SE of B-14

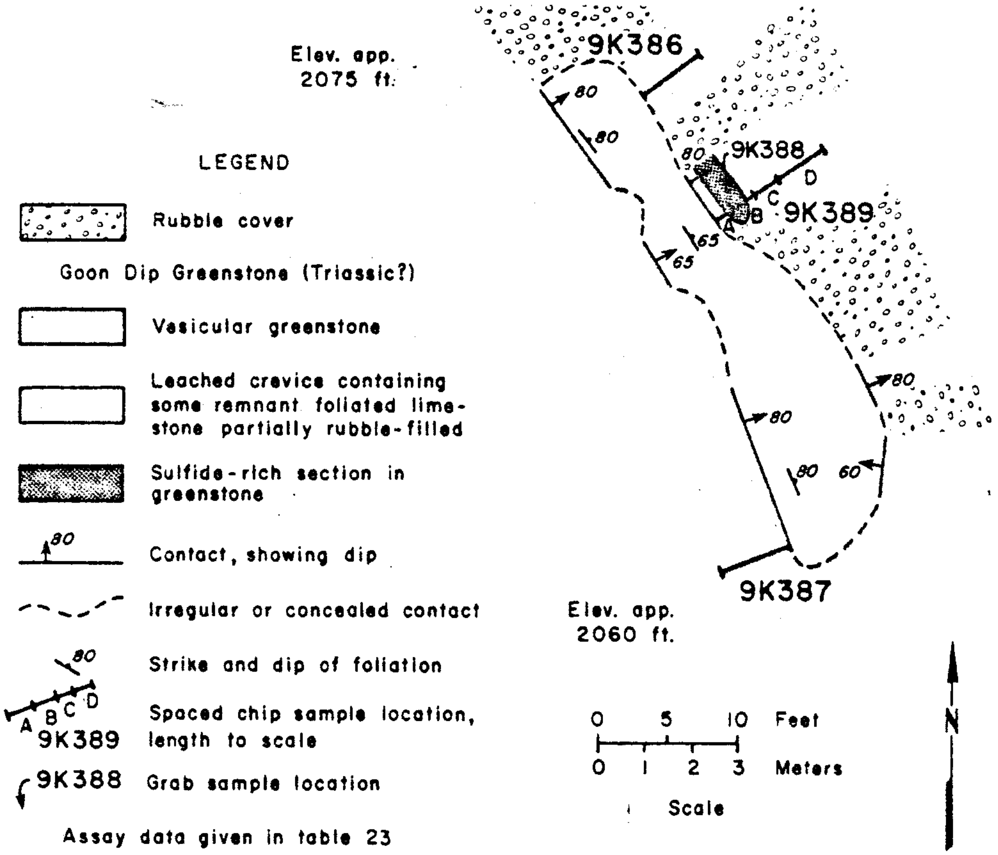


FIGURE 15. - Mineralization on Lucky Devil No. 13 claim, Mt. Baker

TABLE 23. Assay data, Mt. Baker prospect, summit and vicinity

Sample	Type	Sample Length Feet	(M)	Analysis PPM Spec Cu	Spec Ag	AAS Au	AAS Cu	Description
				Stained zones at and near summit of Baker Peak				
9K370	Chip	2.8	0.9	7	N	N	15	Iron-stained sheared greenstone with pyrite
9K371	do.	2.0	0.6	5	N	N	10	Greenstone footwall to above
9K372	do.	2.5	0.8	50	N	L	40	Iron-stained greenstone with pyrite
9K373	do.	3.4	1.0	7	N	N	10	Iron-stained greenstone
9K374	Select Grab	-	-	7	N	N	10	Iron-stained greenstone with pyrite
9K375	Chip	0.7	0.2	10	N	N	10	Iron-stained sheared greenstone with pyrite
9K376	Channel	2.8	0.9	1500	N	N	2080	Sheared greenstone with malachite
9K377	Select Grab	-	-	1500	N	N	1280	do.
9K378	Chip	0.8	0.2	100	N	N	155	Sheared greenstone
9K379	Spaced Chip.5ft interval	5.0	1.5	150	N	N	235	Sheared epidotized greenstone
9K380	Chip	4.6	1.4	100	N	N	75	Sheared greenstone
				Lucky Devil lead Ag/Cu (south summit shoulder)				
9K381	Select Grab	-	-	3000	3	0.25	12,300	Greenstone with malachite azurite,chalcopyrite,& pyrite
9K382	Spaced Chip.5ft interval	5.0	1.5	2000	N	L	3,530	do.
9K383	do.	5.0	1.5	2000	3	0.22	3,010	do.
9K384	Select Grab	-	-	5000	2	0.40	11,700	do.
9K385	do.	-	-	5000	3	0.50	15,700	do.
9K386	Spaced Chip.5ft interval	5.0	1.5	150	N	N	230	Greenstone on hanging wall of crevice zone
9K387	do.	5.0	1.5	300	N	N	510	Greenstone on footwall of crevice zone
9K388	Select Grab	-	-	5000	3	1.0	4,800	Greenstone with chalcopyrite digenite,pyrite & malachite
9K389A	Chip	1.5	0.5	3000	1	0.15	3,820	Greenstone with chalcopyrite and malachite
9K389B	do.	2.0	0.6	1500	0.5	0.10	2,560	do.
9K389C	do.	2.0	0.6	500	N	N	780	do.
9K389D	do.	4.0	1.2	200	N	N	425	do.
9K390	Composite Grab	-	-	70	N	0.05	195	Limestone with iron-stained partings

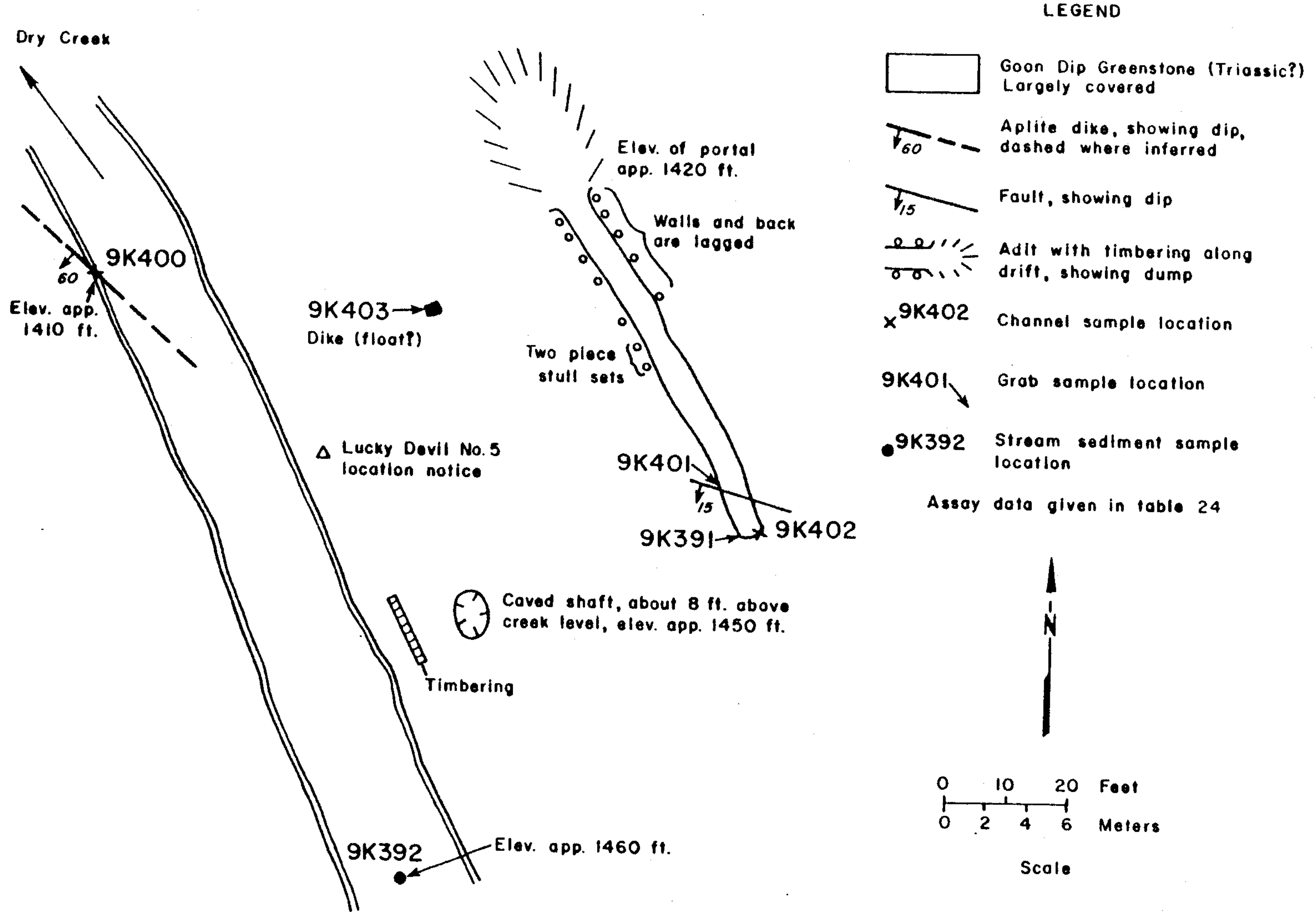


FIGURE 16. - Upper "old" adit, Mt. Baker, sample locations

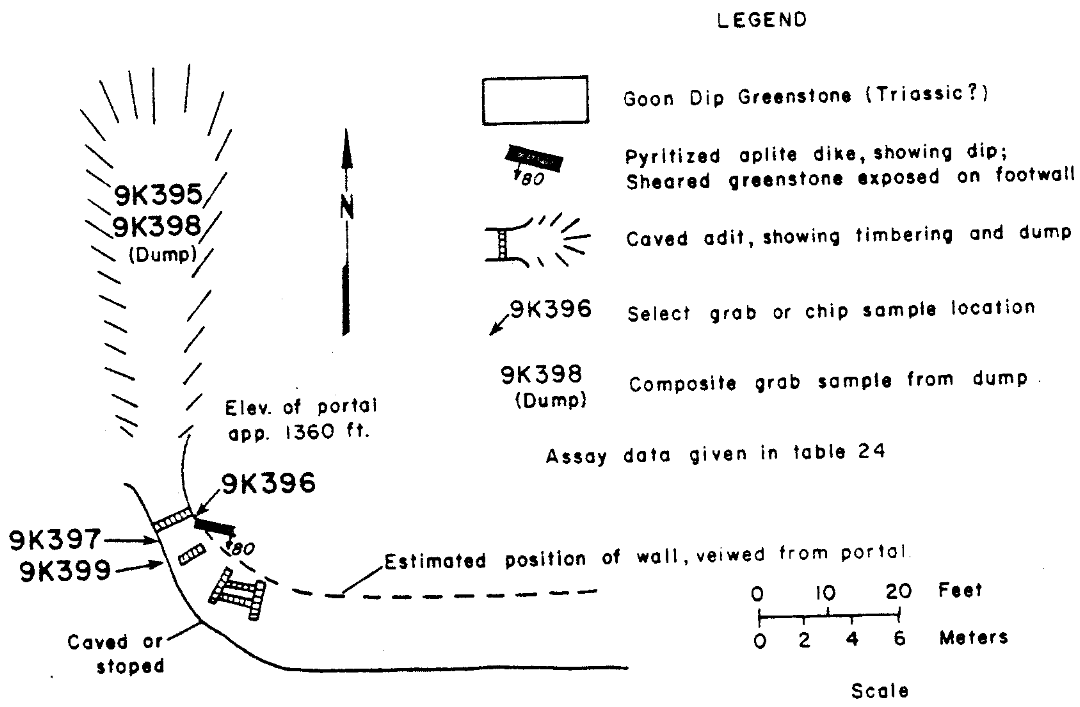


FIGURE 17. - Lower "old" adit, Mt. Baker, sample locations

TABLE 24. Assay data, Mt. Baker prospect, old adits

Sample	Type	Sample Length Feet	(M)	Analysis PPM Spec Cu	AAS Au	AAS Cu	Description
Upper adit, elevation 1,420 ft.							
9K391	Composite Grab	-	-	50	N	45	Sheared greenstone in face of adit
9K392	Stream Sediment	-	-	-	1.1	190	
9K400	Chip	0.7	0.2	15	N	90	Iron-stained pyritized aplite dike
9K401	Composite Grab	-	-	70	0.70	10	Iron-stained sheared greenstone
9K402	Channel	0.4	0.1	50	0.10	60	Pyritized greenstone zone in face of adit
9K403	Select Grab	-	-	30	N	15	Iron-stained pyritized aplite dike
Lower adit, elevation 1,360 ft							
9K395	Select Grab	-	-	15	0.05	180	Iron-stained greenstone with pyrite from dump
9K396	Chip	1.8	0.5	10	N	5	Iron-stained pyritized aplite dike
9K397	Select Grab	-	-	70	N	10	Sheared greenstone with pyrite on footwall of dike
9K398	Composite Grab	-	-	70	0.10	80	Greenstone from dump
9K399	Select Grab	-	-	100	N	80	Iron-stained gossaniferous greenstone on footwall of dike

TABLE 25. Assay data, Mt. Baker prospect, workings on N. side of Mt. Baker

Sample	Type	Sample Length Feet	Sample Length (M)	Analysis PPM Spec Cu	Analysis PPM AAS Au	Analysis PPM AAS Cu	Description
Trench L and L-1							
9K568	Chip	5.5	1.7	101	<0.02	107	Greenstone with pyrite and pyrrhotite
9K569	do.	5.0	1.5	58.6	<.02	68	do.
9K570	Select Grab	-	-	76.7	<.02	87	Iron-stained greenstone with pyrite
Trench M and M-1							
9K565	Chip	5.0	1.5	33.6	<.02	36	Greenstone with pyrite
9K566	do.	3.2	1.0	47.1	<.02	47	do.
9K567	do.	1.7	0.5	51.4	<.02	53	Iron-stained gossaniferous greenstone
Trench N							
9K564	Chip	3.0	0.9	68.9	<.02	58	Iron-stained greenstone with pyrite and pyrrhotite
Trench O							
9K562	Chip	0.7	0.2	45.3	.08	48	Iron-stained gossaniferous greenstone with pyrite
9K563	Spaced Chip.5ft interval	3.0	0.9	83.0	<.02	82	Iron-stained greenstone with pyrite and pyrrhotite
Trench P							
9K439	Chip	3.0	0.9	4.4	.02	6	Pyritized aplite dike
9K440	do.	2.0	0.6	< 0.8	<.02	3	do.
9K441	Select Grab	-	-	1.4	.06	7	Iron-stained gossaniferous greenstone with pyrite
9K442	Chip	1.2	0.4	5.5	<.02	9	do.
Trench Q							
9K443	Chip	3.0	0.9	<.8	<.02	3	Iron-stained pyritized aplite dike
9K444	do.	3.0	0.9	<.8	.04	2	do.
9K445	do.	3.0	0.9	.9	<.02	2	do.
9K446	do.	3.0	0.9	<.8	<.02	2	do.
9K447	do.	4.0	1.2	10.6	<.02	18	do.
9K448	do.	4.0	1.2	<.8	<.02	1	do.
9K462	do.	3.5	1.1	29.1	<.02	35	Greenstone with pyrite
9K463	do.	4.7	1.4	28.6	<.02	33	do.

TABLE 25. Assay data, Mt. Baker prospect, workings on N. side of Mt. Baker (cont.)

Sample	Type	Sample Length Feet	(M)	Analysis PPM Spec Cu	AAS Au	AAS Cu	Description
				Trench R			
9K571	Chip	1.9	0.6	2.0	0.06	5	Iron-stained pyritized aplite dike
9K572	do.	2.0	0.6	30.2	0.06	33	Iron-stained sheared greenstone with pyrite
9K573	do.	1.2	0.4	341	<.02	31	do.
9K574	do.	7.5		281	<.02	230	do.
				Adit at 1,780 ft elevation			
9K495	Chip	3.5	1.1	139	0.14	145	Iron-stained sheared greenstone with pyrite
9K496	do.	2.0	0.6	134	0.28	136	do.
9K497	do.	0.8	0.2	455	8.6	430	Iron-stained gossaniferous greenstone
9K498	do.	2.0	0.6	2730	0.20	2450	Iron-stained greenstone with pyrite
9K499	do.	1.5	0.5	1090	2.6	840	do.
9K500	Select Grab	-	-	17800	0.24	16,300	Iron-stained greenstone w/ pyrite and chalcopyrite
				Trench near S. shore Lake Morris and vicinity			
9K393	Select Grab	-	-	200	N	195	Iron-stained greenstone with pyrite
9K394	Composite Grab	-	-	150	N	295	Greenstone at contact with iron-stained limestone
				Other Samples			
9K559	Select Grab	-	-	111	0.16	105	Iron-stained greenstone with pyrite
9K560	Spaced Chip.5ft interval	5.0	1.5	21.7	0.02	24	do.
9K561	Select Grab	-	-	11.8	<.02	18	do.

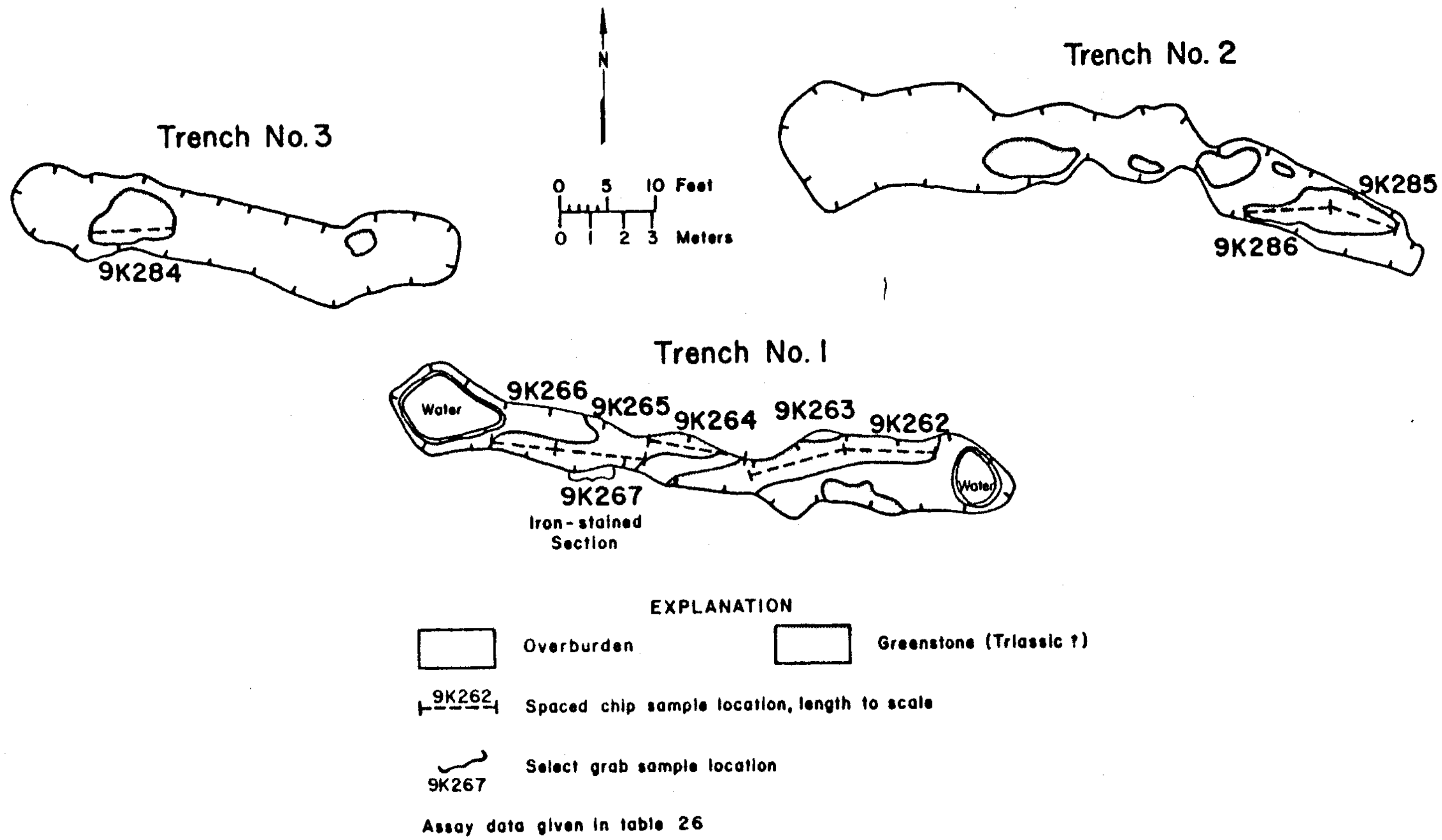


FIGURE 18. - Muskeg trenches, Mt. Baker, sample locations

TABLE 26. Assay data, Muskeg trenches on the south side of Mt. Baker

Sample	Type	Sample Length Feet	Sample Length (M)	Analysis PPM Spec Cu	Analysis PPM AAS Au	Analysis PPM AAS Cu	Description
Trench No. 1							
9K262	Spaced Chip 1ft interval	10	3.0	70	N	60	Greenstone
9K263	do.	10	3.0	100	N	150	do.
9K264	do.	10	3.0	100	N	90	do.
9K265	do.	10	3.0	100	N	105	do.
9K266	do.	5	1.5	100	N	120	do.
9K267	Select Grab	-	-	100	N	80	Sparsely iron-stained greenstone
Trench No. 2							
9K285	Spaced Chip 1ft interval	7	2.1	50	L	35	Greenstone
9K286	do.	7	2.1	70	N	30	do.
Trench No. 3							
9K284	Spaced Chip 1ft interval	8	2.4	100	N	100	Greenstone
Stream W. of trenches							
9K287	Stream sediment	-	-	100	-	-	

TABLE 27. Assay data, Mt. Baker prospect, other samples, near summit

Sample	Type	Analysis PPM			Description
		Spec Cu	AAS Au	AAS Cu	
9K210	Composite Chip	150	N	120	Greenstone, some sections contain sparse chalcopyrite
9K211	Select Grab	100	N	65	Iron-stained greenstone with pyrite (float)
9K212	do.	70	N	30	do.
9K213	do.	20	N	10	do.
9K214	Composite Grab	100	N	120	do.
9K229	Select Grab	20	N	50	Limestone
9K230	do.	70	N	55	Greenstone

Samples located on Plate 9

the copper bearing zone, yielded several anomalous values, but no trends. A more extensive soil sampling survey in 1971 (Moerlein, 1971) covering an area 1,000 feet wide and 1,400 feet long in the northwesterly direction of projected strike, gave similar results. The only grouping of anomalous copper values occurred in overburden down slope from known high grade mineralization. An electromagnetic (EM) survey conducted along the same grid lines revealed no anomalies. The soil geochemistry and EM survey extended to below the 1,500 foot elevation.

Two lower underground workings at elevations of approximately 1,360 and 1,420 feet are situated down slope to the northwest of the EM-soil grid and about 1,500 feet northwest of the upper crosscut - drift driven near the upper end of the known copper mineralization. These lower adits were mapped and sampled as far as they were accessible during the present study. Assays did not reveal significant copper, gold or silver. These adits are referred to by Overbeck (1919) and are shown on an unpublished 1917 Treadwell Mining Company sketch map by Livingston Wernecke. Plate 9 and figures 16 and 17 give the locations of the workings and 1979 samples. Analyses are given in table 24.

The relationships, if any, between the zones explored by the upper and lower groups of workings is not established, however, both zones strike northwesterly and lie within the same general northwest trend.

Along this trend between the upper and lower workings and to the southwest of it on the west shoulder of Mt. Baker, a series of trenches has been opened on several separate heavily iron-stained structural features, some of which are apparently altered pyritic dikes. Other features are so altered that it is not clear whether they are dikes or not. Exposures in these trenches were sampled in 1979 during the present study. Analyses revealed little copper, gold, or silver of interest (plate 10 and tables 23 and 25). No obvious primary or secondary copper minerals were seen.

The copper rich zone near the 1,900 foot elevation is obscured by heavy overburden and when sampled in 1953 was exposed only in the trenches and the crosscut - drift. The portal was partly closed and trenches sloughed in 1979.

Slide rock and talus conceal possible extension of the copper bearing structure southeastward for nearly 500 feet to the base of the high cliffs on the north side of the peak. No obvious mineralized structure was seen in the cliffs where the projection of the copper bearing zone would be expected. However, a conspicuous, but inaccessible, green stain near the top of the cliff face was seen. Visual inspection and sampling of bedrock exposures on the ridge crest directly above this stain exhibited no suggestion of structural or mineralogical continuity, however secondary copper minerals, chrysocolla or malachite, occur in a small shear zone in the greenstone a short distance down the southeasterly slope from the ridge crest which strikes generally toward the stained area. The locations of samples obtained in the immediate summit area are shown on plate 9. Analyses and brief descriptions are given in table 23. Sample 9K376 and 377 are from the secondary copper shear zone noted and sample 9K380 is from along the lip of the cliff at the ridge crest above the cliff stain about 50 feet northwest of the shear zone. This shear zone was not visible on weathered rock surfaces except for traces of copper stain in float and was found only as earthy "paint" on shear faces of rocks freshly fractured during examination of accessible outcrops in the cliff stain vicinity. Except for the lip of the cliff and the cliff itself few nearby outcrops occur along the projection of this copper bearing zone.

The small shear zone just described appears to lie roughly within the same structural trend as the cliff stain and the zone containing primary copper mineralization in the trenches and adit more than 200 feet below to the northwest of the summit. Also, generally along the same trend nearly 600 feet southeast of the summit area and just above the 2,000 foot elevation, two crevice exposures of copper mineralization associated with limestone lenses occur. Both are nearly vertical and appear to be aligned and trend N35° to 50°W. They have elevations of about 2,070 and 2,125 feet as shown on plate 9. Samples 9K381-384 are also shown and were taken from the upper crevice site. Results of analyses are given in table 23 previously cited. The lower and larger mineralized limestone lens is shown in detail in figure 15. Here the copper mineralization occurs in the greenstone adjacent to the limestone lens. It is most intense on the greenstone walls as secondary coating on weathered surfaces. Primary chalcopyrite was noted on some freshly broken greenstone surfaces. The lateral contacts between greenstone and limestone, where visible, appeared sharp and planar, and roughly parallel the foliation in both the greenstone and the limestone. The northwestern end contact of the limestone lens is covered by rubble, however the lens terminates at the southeast end in an abrupt irregular contact with the amygdaloidal greenstone, having sharp transition from limestone to greenstone along strike. No copper mineralization was seen in the limestone itself except at contacts. Lateral contact surfaces of greenstone from which the limestone is largely eroded away appear to consist of a series of small subparallel slip planes.

Near the base of the mountain and 4,000 feet southeast of the summit (plate 9) a 140 foot width of greenstone is partially exposed in open cuts which are well within the bounds of the southeast extension of the lode claim group. Samples gave copper values of from 30 to 150 ppm (figure 18 and table 26), and appear to be unmineralized.

The general alignment of the copper showings, which include those on the northwest side of Mt. Baker, the cliff stains, the malachite or chrysocolla zone southeast of the summit, and the two calcareous crevice zones farther to the southeastward, suggest that they lie roughly in a plane which, because of its arcuate trace concave to the southeast across the local topography, appears to dip to the southwest.

A ground magnetometer survey by Geo-Recon, Inc., in 1962 (Bush and Kenly, 1962) employed a proton magnetometer capable of measuring total magnetic field to an accuracy of 0.5 gamma. Magnetic profiles were taken across projected structure. Progressive interpolation between profiles resulted in a 6000 foot long magnetic anomaly roughly parallel to regional structure and passing across the east shoulder of Mt. Baker near the summit (plate 9).

An anomaly of 400 gammas was obtained over the copper-rich zone northwest of the summit indicating distinctly measurable response, however a 600 gamma peak was obtained between two nearby structures thought to be altered dikes, and which did not yield significant copper values. Although some local structure including that which contains the copper responds magnetically, the response has not been shown to be associated with copper mineralization. Profile peaks of 400 to 1,000 gammas delineated the 6,000 foot long anomaly.

The magnetic anomaly and the copper trace resulting from joining known copper showings have the same general shape and bearing, and appear to be coincident or nearly so. Both are parallel or subparallel to regional structure. This suggests that they may be structurally or stratigraphically controlled and that they may be closely related. However, although the structure containing the copper mineralization gave a magnetic response, the magnetic anomaly has not been tied to any physical characteristic specifically identified on the ground. Its cause has not been determined.

Other investigations of the Mt. Baker copper prospect were conducted by George Moerlein in the summers of 1967, 1968, 1970, and 1971. They include the previously discussed geochemical soil sampling and electromagnetic surveys in a large grid area northwest of the peak and other similar, but more generalized geochemical and geophysical surveys on the same side of the mountain. Extensive soil and stream sediment sampling was also done on the southeastern slope, partly along three contoured sample lines between the 100 and 1,600 foot elevations. Plate 9 showing Moerleins' sampling results gives copper values equal to or greater than 150 ppm numerically on the plate. It is apparent, as Moerlein suggests, that anomalous copper found in soil and stream sediment may easily have its source in mineralized zones, fractures, and shears similar to those already known. In addition, nearly all of the anomalous geochemical values are generally downhill from known copper occurrences.

A modest diamond drilling program was undertaken in 1962 in part to explore the copper-rich zone on the northwest side of the mountain farther to the northwest along strike and at depth. It is reported that the restrictive administration of funds allotted to the project and the small scale of the project contributed to the project's falling short of accomplishing its objectives.

The possibility of copper occurrences to the northwest of the known occurrences was investigated during this study. The lode claim block covering the Mt. Baker prospect extends more than 1.5 miles northwest of the summit of Mt. Baker to the upper slopes of Mt. Fritz and Mt. Crowther northeast of Lake Morris and extends northwesterly to cover localities where John Brockway, owner, reports having found copper bearing float in talus and rubble on those mountain slopes. Reconnaissance of the Mt. Fritz - Mt. Crowther - Lake Morris area (figure 19) during the present study revealed anomalous copper in stream sediments, stream float, and talus rubble. Slightly anomalous copper was measured in an occasional bedrock grab sample. The significant copper values came from float in debris fans below gullies or from stream sediments collected from streams entering the top of these alluvial fans. The highest copper assay of 15,000 ppm came from a talus boulder bearing secondary copper minerals on slip surfaces. Copper assays of samples from this area otherwise range from 20 to 1,500 ppm and are reported in table 28. All samples are from within the Goon Dip greenstone except 9K393 and 394 which are from a trench along the contact between the greenstone and the Whitestripe Marble near the southeastern end of Lake Morris. The assays are given in

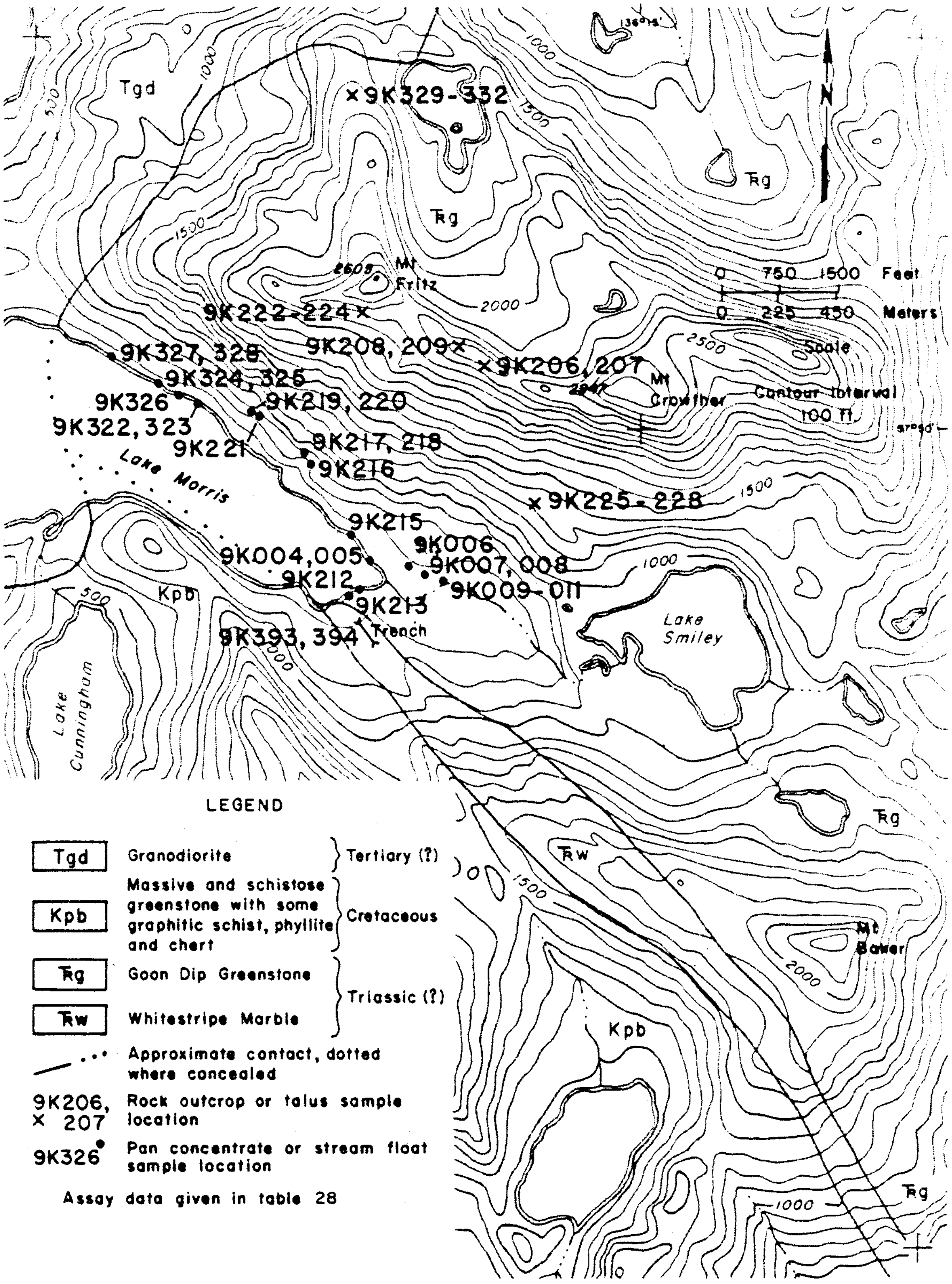


FIGURE 19. - Mt. Fritz - Mt. Crowther - Lake Morris, sample locations (Geology adapted from Johnson and Karl, 1982)

TABLE 28. Assay data, N. side of Lake Morris, Mt. Fritz - Mt. Crowther area

Sample	Type	Analysis PPM							Description
		AAS	AAS	Spec	Spec	Spec	Spec	Spec	
		Cu	Zn	Cu	Zn	Ag	Mo	Sn	
9K004	Stream Sediment	140	45	150	N	N	N	N	-
9K005	do.	180	50	150	N	N	N	N	-
9K006	Grab	85	45	200	N	N	N	N	Float
9K007[1/]	Stream Sediment	500	40	500	N	N	N	N	-
9K008	do.	600	45	500	N	0.5	N	N	-
9K009	do.	230	40	200	N	N	N	N	-
9K010	Select Grab	320	45	1000	N	N	N	N	-
9K011	Stream Sediment	200	25	100	N	N	N	N	-
9K012	do.	40	60	70	N	N	N	N	-
9K013	do.	65	80	100	N	N	N	N	-
9K206	do.	290	20	300	N	N	N	N	Iron-stained greenstone
9K207	do.	45	25	20	N	N	N	N	-
9K208	do.	45	25	50	N	N	N	N	Greenstone
9K209	Select Grab	170	20	200	N	N	N	N	Greenstone with malachite and pyrite float
9K215	Stream sediment	-	-	100	N	N	N	N	-
9K216	do.	-	-	200	N	N	N	N	-
9K217	do.	-	-	500	N	N	N	N	-
9K218	Grab	1300	25	1500	N	0.5	N	10	Float
9K219	Stream sediment	-	-	200	N	N	N	N	-
9K220	Select Grab	220	40	200	N	N	N	N	Iron-stained greenstone with pyrrhotite float

TABLE 28. Assay data, N. side of Lake Morris, Mt. Fritz - Mt. Crowther area (cont.)

Sample	Type	Analysis PPM								Description
		Sample Width (Feet)	AAS Cu	AAS Zn	Spec Cu	Spec Zn	Spec Ag	Spec Mo	Spec Sn	
9K221	Stream Sediment		-	-	200	N	N	N	N	
9K222	Float Grab		320	15	200	N	N	N	N	Greenstone,disseminated pyrite and minor chalcopyrite
9K223	Composite Chip		110	20	150	N	0.5	N	N	Outcrop and float
9K224	Select Grab		210	15	150	N	N	N	N	Meta-andesite with pyrrhotite float
9K225	Channel Float	0.9	200	10	200	N	0.5	N	N	Quartz with malachite,azurite and chalcopyrite float
9K226	Select Grab Float		650	10	300	N	0.5	N	N	do.
9K227	do.		9500	10	15,000	50	3	N	N	Greenstone with minor limestone(?) & malachite
9K228	Composite Chip		150	40	100	N	N	N	N	
9K322	Stream sediment		35	345	70	N	N	N	N	
9K323	Select Grab Float		690	105	500	200	N	N	N	Iron-stained greenstone with pyrrhotite dissemination in amygdules
9K324	Stream sediment		70	345	100	N	N	N	20	
9K325	do.		110	255	70	N	N	N	N	
9K326	Select Grab Float		860	20	500	N	N	N	N	Iron-stained greenstone with disseminated pyrrhotite
9K327	Stream sediment		80	205	100	N	N	N	N	
9K328	Select Grab Float		560	20	500	N	N	N	N	Iron-stained greenstone with sulfides
9K329	Channel	1.0	25	5	50	N	N	N	N	Iron-stained quartz vein at tonalite/greenstone contact
9K330	Grab		155	15	150	N	N	N	N	
9K331	Grab		160	10	100	N	N	N	N	
9K332	Composite Grab		250	5	200	N	N	N	N	

table 25. The samples are slightly anomalous in copper and are from iron stained pyritic greenstone in the trench wall.

The Whitestripe Marble extends to the south shore of Lake Morris and does not re-appear on the north shore. The greenstone is interrupted just to the northwest of the summit of Mt. Fritz by a large body of Tertiary(?) quartz diorite which surrounds Lake Elfendahl. The contact is sharp, appears to be nearly vertical where examined, and is virtually unmineralized.

Copper in Greenstone

The Goon Dip Greenstone volcanics merited special attention because of geological similarities with other greenstones in Alaska with which copper is associated. The Goon Dip Greenstone occurs on Chichagof Island as an irregular band for 45 miles through the core of the study area and ranges up to three miles wide (plate 11). It is interrupted near Lisianski Strait, then it, or its equivalent, reappears as a much smaller body near the north end of Yakobi Island.

Copper in anomalous quantities is associated with the Goon Dip Greenstone at several localities. The largest and highest grade showings known to date occur on Mt. Baker and are discussed along with anomalous samples from the Lake Morris, Mt. Fritz - Mt. Crowther area, immediately to the northwest of Mt. Baker in the previous section of this report titled Mt. Baker Copper Prospect (plate 9 and figures 14 through 19, and tables 22 through 28).

During the present study stream sediments, bedrock, and float samples were collected from the greenstone and nearby associated rocks. Prospects, occurrences, and mining claims were examined and certain geochemical stream sediment and water sample localities were further investigated in order to isolate potential sources of metals detected in the samples. Samples representing measured widths across the structure were also obtained from large greenstone exposures which were selected from more than a dozen widely separated sites. These samples are thought to be reasonably indicative of the copper background in the greenstones.

The locations of samples collected during this study from the greenstone area are shown on plate 11 or in figures 20 and 22, except for those just cited as having been discussed in the Mt. Baker Copper Prospect section.

Samplings from four claim groups named Ushk, Ram, Falls, and Pat, comprising 60, 21, 36, and 40 claims respectively, are reported here and not in a separate report section since the commodity sought is thought to be copper and since three of the four groups are partly within the greenstone and the fourth (Falls group) less than one mile to the west.

The Goon Dip Greenstone of Triassic age and the overlying Whitestripe Marble have lithologic and stratigraphic relationships very similar to the Nikolai Greenstone and Chitistone Limestone of the Wrangell Mountains (Plafker and others, 1976), where the Kennecott Copper deposits occur in the Chitistone Limestone. No clear evidence of Kennecott type deposits has been reported or was found in the West Chichagof - Yakobi Islands area during this study. Also, no native copper in the Goon Dip Greenstone, such as occurs in the Nikolai Greenstone, was detected although looked for. One instance of Bureau of Mines follow-up developed a series of anomalous zinc bearing stream sediment sample assays and chalcopyrite

TABLE 29. Assay data, Goon Dip Greenstone samples

Plate 11	Sample	Type	Analysis PPM AAS Cu	Description
1	9K480	Channel	180	Qtz vein in chlorite schist(0.5ft)
	9K482	Select Grab	78	Fe-stained greenstone with pyrite and pyrrhotite
2	9K194	Stream sediment	380	
3	9S595	Chip	13500	Disseminated sulfides under gossan
	9S597	Grab	1800	Gossan & pods of sulfides
	9S598	Grab	4350	Cu-stained greenstone and sulfides
4	9K311	Composite Grab	10	Epidote & diorite(?) stringers in greenstone
	9K312	do.	190	Greenstone in contact with diorite
	9K313	do.	10	Diorite in contact with greenstone
5	9K314	Spaced Chip 2ft interval	55	Greenstone with minor malachite (50 ft. sample)
	9K315	Composite Grab	105	Marble
	9K316	do.	90	Greenstone with lens of marble
	9K317	Spaced Chip 2ft interval	65	Greenstone with minor malachite (50 ft. sample)
	9K318	Spaced Chip 10ft interval	130	Greenstone with minor malachite and sulfides (300 ft. sample)
	9K319	Select Grab	260	Greenstone with malachite
	9K320	Composite Grab	270	
	9K321	Select Grab	600	
6	8S084	Grab	50	Volcanic rock
	8S085	Stream sediment	95	-
7	9K305	Composite Grab	115	Greenstone with epidote-filled vesicles
	9K306	do.	170	do.
	9K307	do.	130	do.
8	9K184	Composite Grab	5	Greenstone
9	8S069	Stream Sediment	200	-

TABLE 29. Assay data, Goon Dip Greenstone samples(cont.)

Plate 11	Sample	Type	Analysis PPM AAS Cu	Description
10	8S070	Stream sediment	225	-
11	8S056	Random Chip	5	Fe-stained quartz
	8S057	Select Grab	520	Quartz and sparse sulfides and Cu stain
12	8S055	2ft chip	20	Fe-stained zone in schist
13	9S426A	Chip	85	Fe-stained phyllite-schist
	9S426B	do.	120	Fault gouge
	9S426C	do.	85	Phyllite
	9S427	Grab	55	Phyllite
	9S428	do.	110	Fe-stained phyllite
14	9K145	Composite Grab	15	Pegmatite dike
	9K146	do.	15	Diorite and pegmatite at greenstone contact
	9K147	do.	210	Greenstone

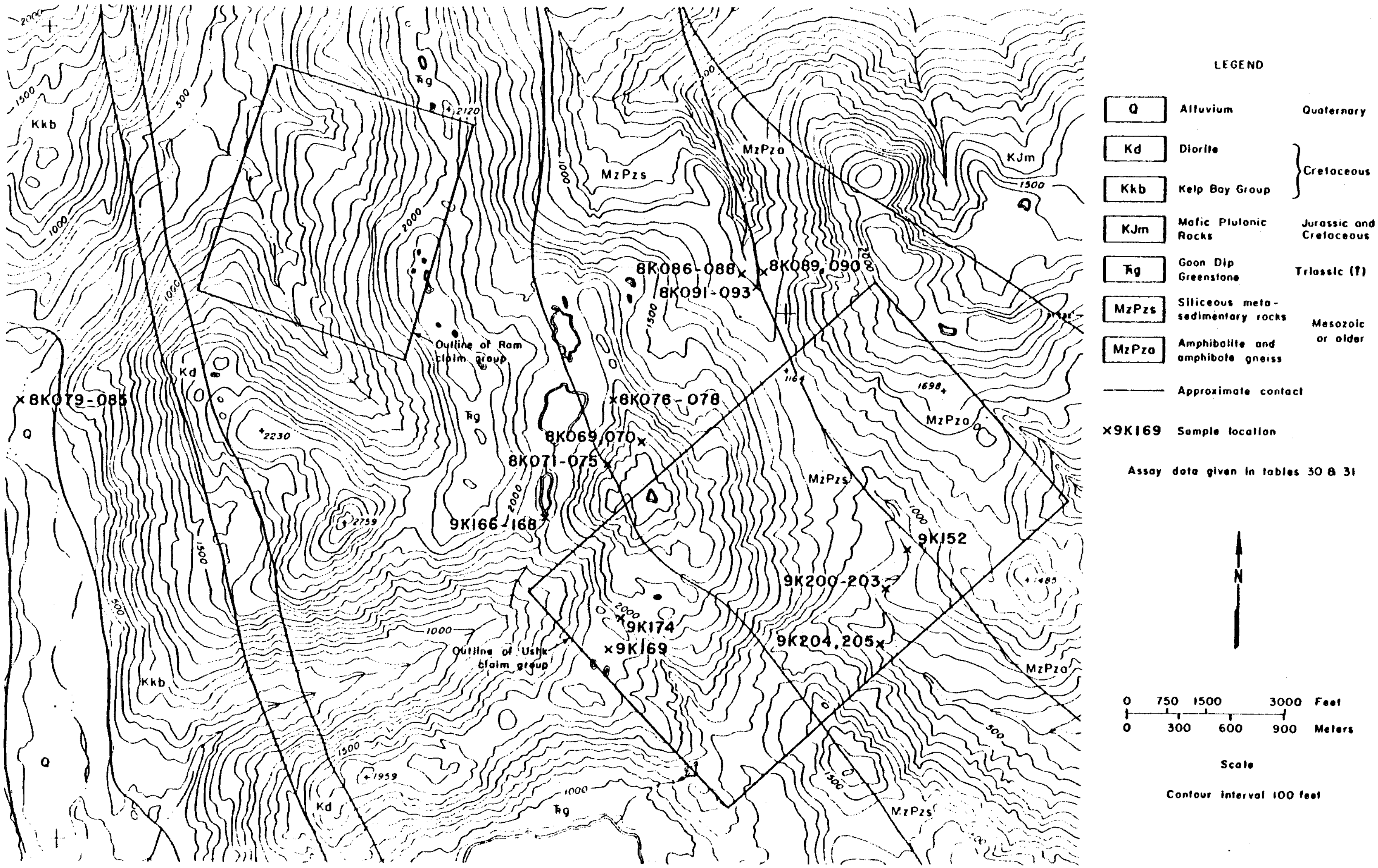


FIGURE 20. - Ushk and Ram claim groups, sample locations (Geology adapted from Johnson and Karl, 1982)

TABLE 30. Assay data, Ushk claims

Sample	Type	Sample Length Feet	Sample Length (M)	Analysis PPM AAS Cu	Spec Ag	Spec Mo	Spec Cu	Description
8K069	Spaced Chip 1ft interval	17.1	5.2	45	N	N	100	Iron-stained chert w/pyrite and pyrrhotite
8K070	Select Grab	-	-	5	N	N	L	Iron-stained quartz from pod
8K071	do.	-	-	25	N	N	50	White chert float w/pyrite and pyrrhotite
8K072	do.	-	-	50	L	N	100	Iron-stained andesite float
8K073A[1]	Spaced Chip 1ft interval	18.4	5.6	25	N	N	50	Iron-stained white chert
8K073B	do.	13.8	4.2	50	L	15	100	Iron-stained andesite
8K074	do.	27.9	8.5	50	L	5	100	Banded chert w/pyrite
8K075	Select Grab	-	-	85	N	10	200	Iron-stained chert float
8K076	Grab	-	-	80	N	10	150	Greenstone float w/quartz stringers
8K077	do.	-	-	120	N	N	150	Diorite float
8K078	do.	-	-	55	L	N	100	Greenstone float w/quartz stringers
8K086	Pan concentrate	-	-	45	N	N	100	-
8K087	Grab	-	-	55	N	N	150	Phyllite float w/pyrrhotite
8K088	do.	-	-	90	0.5	N	200	Hornfels & phyllite float w/pyrite & pyrrhotite
8K089	Pan concentrate	-	-	150	N	N	300	Andesite and greenstone with pyrite
8K090	Grab	-	-	25	N	N	50	Chert float with pyrite
8K091	Pan concentrate	-	-	80	N	N	200	Chert, andesite and quartz
8K092	Grab	-	-	290	0.7	100	500	Amphibolite float w/pyrite
8K093	do.	-	-	15	N	N	50	Chert float w/pyrite
9K152	Stream sediment	-	-	INS	N	N	100	Limestone w/pyrite, greenstone w/pyrrhotite, diorite, amphibolite, andesite w/pyrite and pyrrhotite and chert with pyrrhotite in +100 mesh
9K166	do.	-	-	INS	N	N	200	Amphibolite
9K167	Composite Grab	-	-	100	N	N	150	do.
9K168	do.	-	-	55	N	N	100	do.
9K169	do.	-	-	160	N	N	200	Amphibolite

TABLE 30. Assay data Ushk claims (cont.)

Sample	Type	Sample Length Feet	Sample Length (M)	Analysis PPM AAS Cu	Analysis PPM Spec Ag	Analysis PPM Spec Mo	Analysis PPM Spec Cu	Description
9K174 2/	Composite Grab	-	-	190	N	N	300	Greenstone
9K200	Grab	-	-	150	N	N	150	Iron-stained phyllite float with quartz stringer with pyrite and pyrrhotite
9K201 3/	Select Grab	-	-	-	-	-	-	Greenstone float with sulfides
9K202A	Stream sediment	-	-	110	N	N	100	Iron-stained phyllite with pyrrhotite
9K203	Grab	-	-	85	N	N	100	Iron-stained phyllite with pyrite and pyrrhotite
9K204	Stream sediment	-	-	INS	N	N	100	-
9K205	Grab	-	-	120	N	N	100	Phyllite float w/sulfides

1/ Sample contains L W by spec analysis
2/ Sample contains 30 ppm Sn by spec analysis
3/ Sample lost

TABLE 31. Assay data, Ram claims

Sample	Type	Analysis PPM AAS Cu	Description
8K079	Stream sediment	120	Detritus includes meta-andesite w/pyrrhotite
8K080	do.	120	do.
8K081[1/]	Composite Grab Float	55	Meta-andesite
8K082	do.	60	Paragneiss with pyrite and chalcopyrite
8K083	do.	80	Meta-andesite w/pyrite and pyrrhotite
8K084	do.	190	Meta-andesite w/pyrite
8K085	do.	110	Meta-andesite with pyrite and pyrrhotite

1/ Sample contained L Ag by Spec analysis

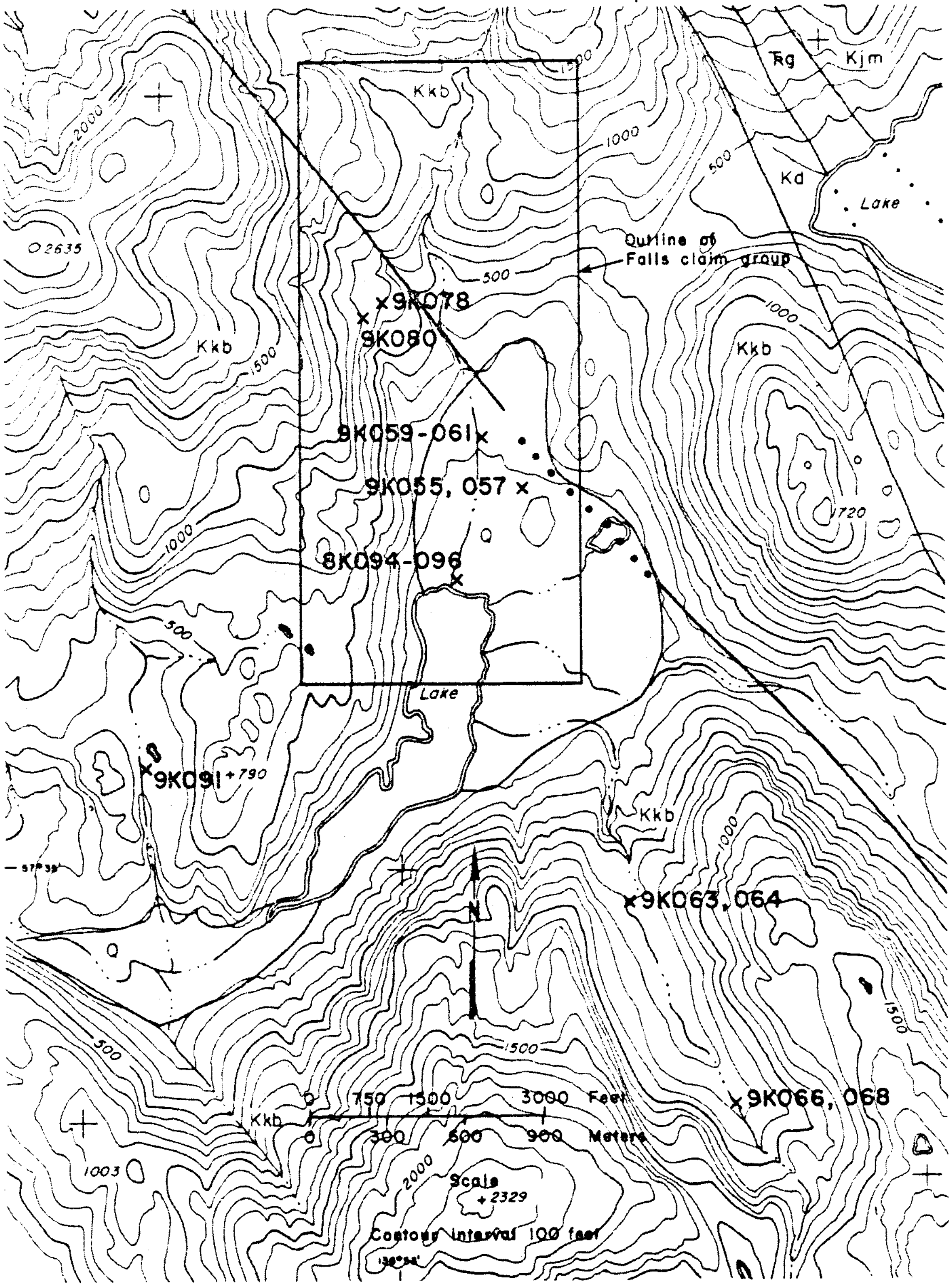


FIGURE 21. - Falls claim group, sample locations (Geology adapted from Johnson and Karl, 1982)

LEGEND

Q	Alluvium	Quaternary
Kd	Diorite	Tertiary (?)
Kkb	Kelp Bay Group	Cretaceous
KJm	Quartz gabbro and gabbro	Jurassic or Cretaceous
₸g	Goon Dip Greenstone	Triassic (?)
———····	Contact, dotted where concealed	
———•••	Fault, dotted where concealed	
x 9K091	Sample location	

Assay data given in table 32

TABLE 32. Assay data, Falls claims

Sample	Type	Analysis PPM AAS Cu	Spec Cu	Spec Sn	Spec Ag	Description
9K055	Stream sediment	40	50	N	N	Chlorite schist, meta-andesite, diorite
9K057	Grab	60	150	N	N	Hornfels float w/pyrite
9K059	Stream sediment	INS	100	N	N	
9K060	Grab	35	70	N	N	Hornfels float w/pyrite
9K061	do.	-	-	N	N	do.
9K063	Stream sediment	50	70	N	N	
9K064	Grab	10	30	N	N	Chert and metachert float
9K066	Stream sediment	40	30	15	N	
9K068	do.	50	70	N	N	Diorite,chlorite schist, meta-andesite and meta-graywacke
9K078	do.	60	100	10	N	
9K080	do.	65	100	N	N	Greenstone, meta-andesite and chlorite schist
9K091	do.	40	50	N	N	
8K094	Pan Concentrate	65	100	N	N	Metadiorite with pyrite and scheelite,hydrothermal rocks with pyrite and arsenopyrite,quartzite, tuffite w/pyrite quartz diorite,leucodiorite and chert in coarse fraction
8K095	Grab	50	100	N	0.5	Chert float
8K096[1]	Grab	300	1000	N	.5	Hydrothermal rock float

1/ Sample contains L W by Spec analysis and 0.05 Au by AAS

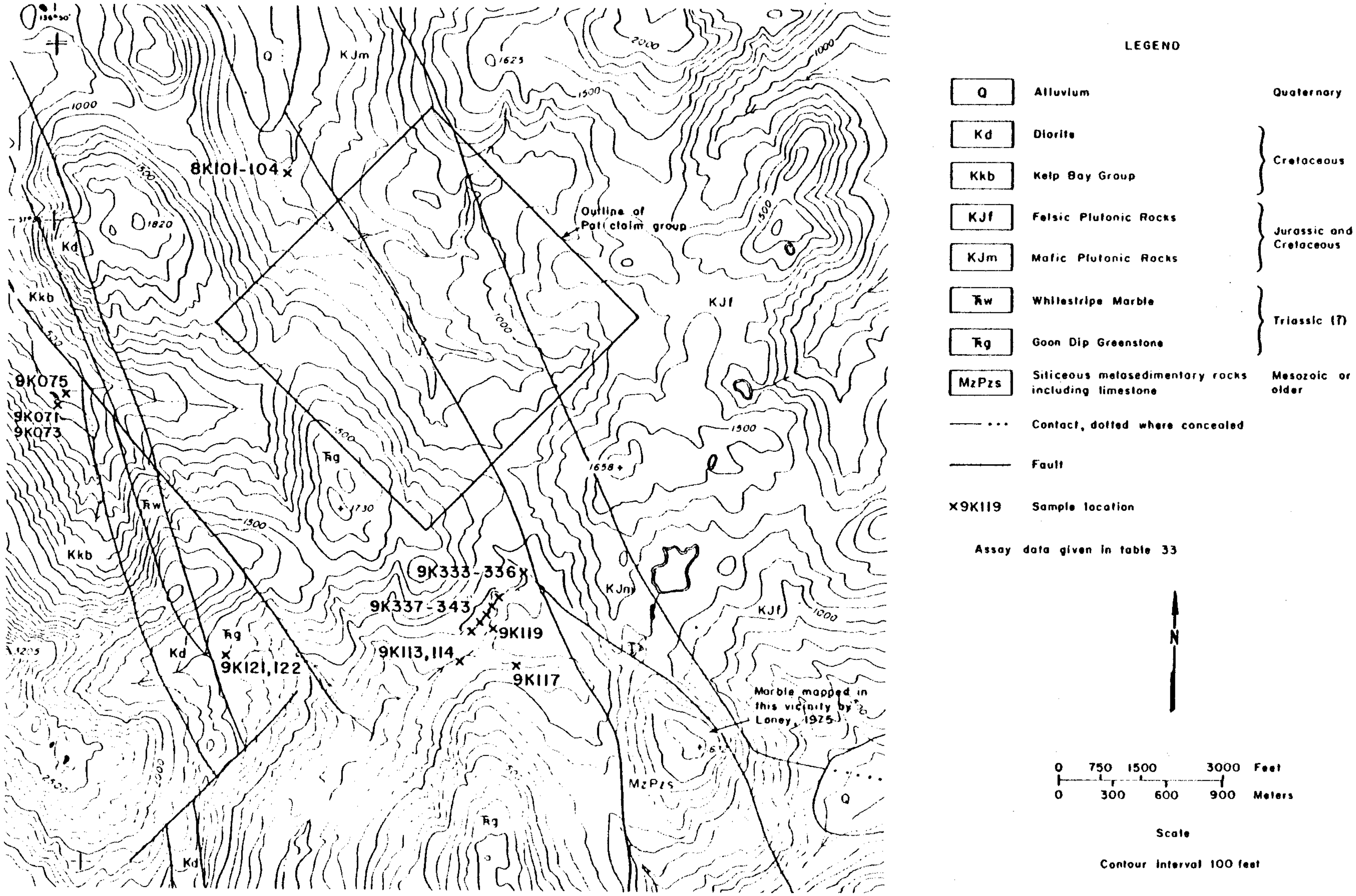


FIGURE 22. - Pat claim group, sample locations (Geology adapted from Johnson and Karl, 1982)

Sitka C6

49S, 60E, sec. 32 vicinity

TABLE 33. Assay data, Pat claims

Sample	Type	Sample Length		Analysis PPM					Description
		Feet	(M)	AAS Cu	AAS Zn	Spec Cu	Spec Sn	Color-metric W	
9K113	Stream sediment	-	-	140	80	200	N	3	
9K114	Grab	-	-	360	1600	500	N	-	Muscovite schist w/ pyrrhotite; para-geneiss w/pyrite
9K117	Stream sediment	-	-	120	65	150	N	3	
9K119	do.	-	-	INS	INS	100	20	L 2	
9K121	do.	-	-	70	90	100	N	-	
9K122	Grab	-	-	15	35	15	N	-	Limestone float
9K333	Stream sediment	-	-	130	275	100	15	-	
9K334	do.	-	-	140	390	100	N	-	
9K335	Chip	2.2	.7	130	360	100	N	-	Iron-stained sheared argillite
9K336	Select Grab	-	-	85	175	100	N	-	do.
9K337	Stream sediment	-	-	160	400	50	N	-	
9K338	do.	-	-	50	180	20	N	-	
9K339	do.	-	-	40	240	70	N	-	
9K340	do.	-	-	55	240	70	20	-	
9K341	do.	-	-	90	245	30	N	-	
9K342	do.	-	-	40	250	10	N	-	
9K343	do.	-	-	40	80	70	20	-	
8K101	Pan con-centrate	-	-	40	10	150	N	-	Amphibolite,andesite diorite,monzonite,& syenite float
8K102	Grab	-	-	140	15	200	N	-	Iron-stained meta-diorite float w/ sparse sulfides
8K103	do.	-	-	200	15	300	N	-	Iron-stained meta-andesite float w/ sparse sulfides
8K104	do.	-	-	100	20	200	N	-	Heavily iron-stain-ed greenstone
9K071	Stream sediment	-	-	90	10	100	N	-	
9K073	do.	-	-	65	10	70	N	-	
9K075	do.	-	-	190	10	150	N	-	Amphibolite

bearing stream float downstream from contacts between greenstone, dioritic intrusive rocks, and older metamorphics containing calcareous rocks (see figure 22, 1/2 mile south of Pat claim block). In this instance, sample results were obtained only after the end of field work on this project and further follow-up could not be undertaken. The nature of this occurrence therefore is not known. No mining claims are located in this vicinity. Based on analyses of samples and sketchy knowledge of local geology, a fairly general, but highly interesting target area is indicated (figure 22 and table 33 previously cited).

More than 20 composite chip samples representing widths of from 5 to more than 300 feet taken from 7 separate localities distributed over a 30 mile stretch of the greenstone assayed 30 to 270 ppm copper by AAS (atomic absorption analysis) and average slightly under 150 ppm copper. They are thought to be indicative of the geochemical background copper content of the greenstones.

Copper minerals were not seen in these sampled sections. In general, rock samples of the greenstone containing less than 200 ppm copper did not exhibit visible copper minerals or stains during sampling.

Numerous localities of greenstone and associated rocks were examined and sampled. Some sites yielded copper stains and occasionally chalcopyrite was seen. A larger number of sites yielded samples whose copper content was distinctly above background and in several isolated instances more than a percent of copper was measured. However, the examination and sampling did not reveal new, high grade occurrences or indicate the presence of large, low grade deposits within the area looked at. However some targets were established, but could not be followed up because they were not known until after field work was over, as sample analyses had not been received.

The four groups of claims, Ushk, Ram, Falls, and Pat (157 claims) staked in 1974 by a major company were allowed to lapse in 1976. However, this occurred when the company ceased mineral exploration in Alaska and is not necessarily related to findings.

Cable Copper Occurrence

Claims were located in 1974 at the eastern end of Mine Mountain, four miles west of the head of Lisianski Inlet, where a fault zone in metamorphosed sedimentary rocks is intermittently copper bearing (plate 1 and figure 23). No prior records of base metals or of mining claims in this vicinity are reported.

The claims were staked along a prominent nearly vertical fault which strikes N65°W. Heavily oxidized sections of the fault are intermittently exposed along a conspicuous northwest trending trough more than 7,000 feet long. The structural trough occurs in a northwesterly band of Mesozoic and Paleozoic (?) metamorphic rocks from 1,000 to 2,000 feet wide which is situated between two large dioritic plutons. The metamorphics are largely gneissic rocks containing some intercalated marble probably of sedimentary derivation.

Examination during the present study revealed that one of the iron stained occurrences near an old tent site in the ravine near the northwest end of the trough, contains copper, zinc, minor silver, and traces of gold (figure 24 and table 34) and that gossan-breccia on the same structure 5,000 feet to the southeast contains copper, but in lesser amounts. Most

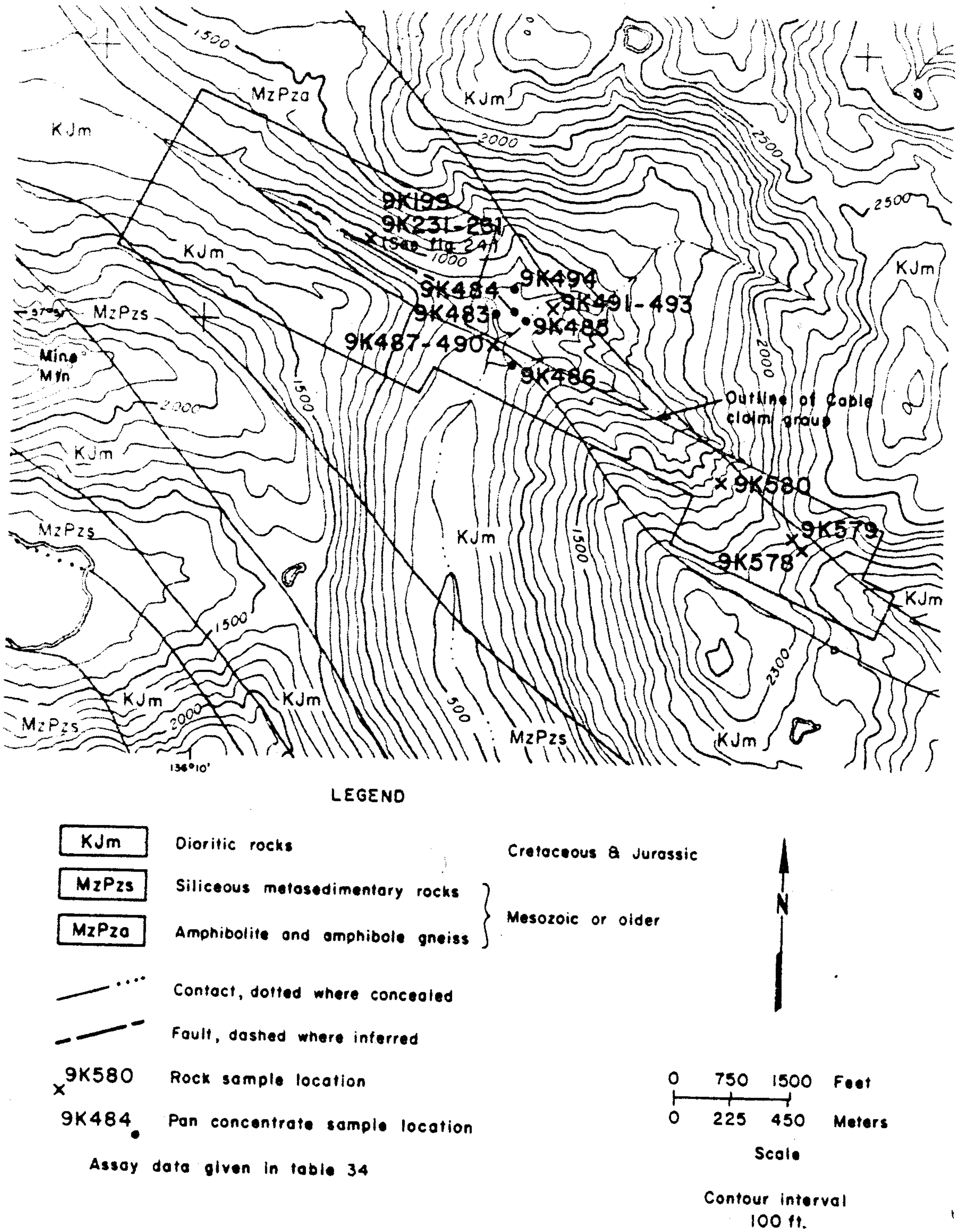


FIGURE 23. - Cable claims and vicinity, sample locations (Geology modified from Johnson and Karl, 1982 and Rossman, 1959)

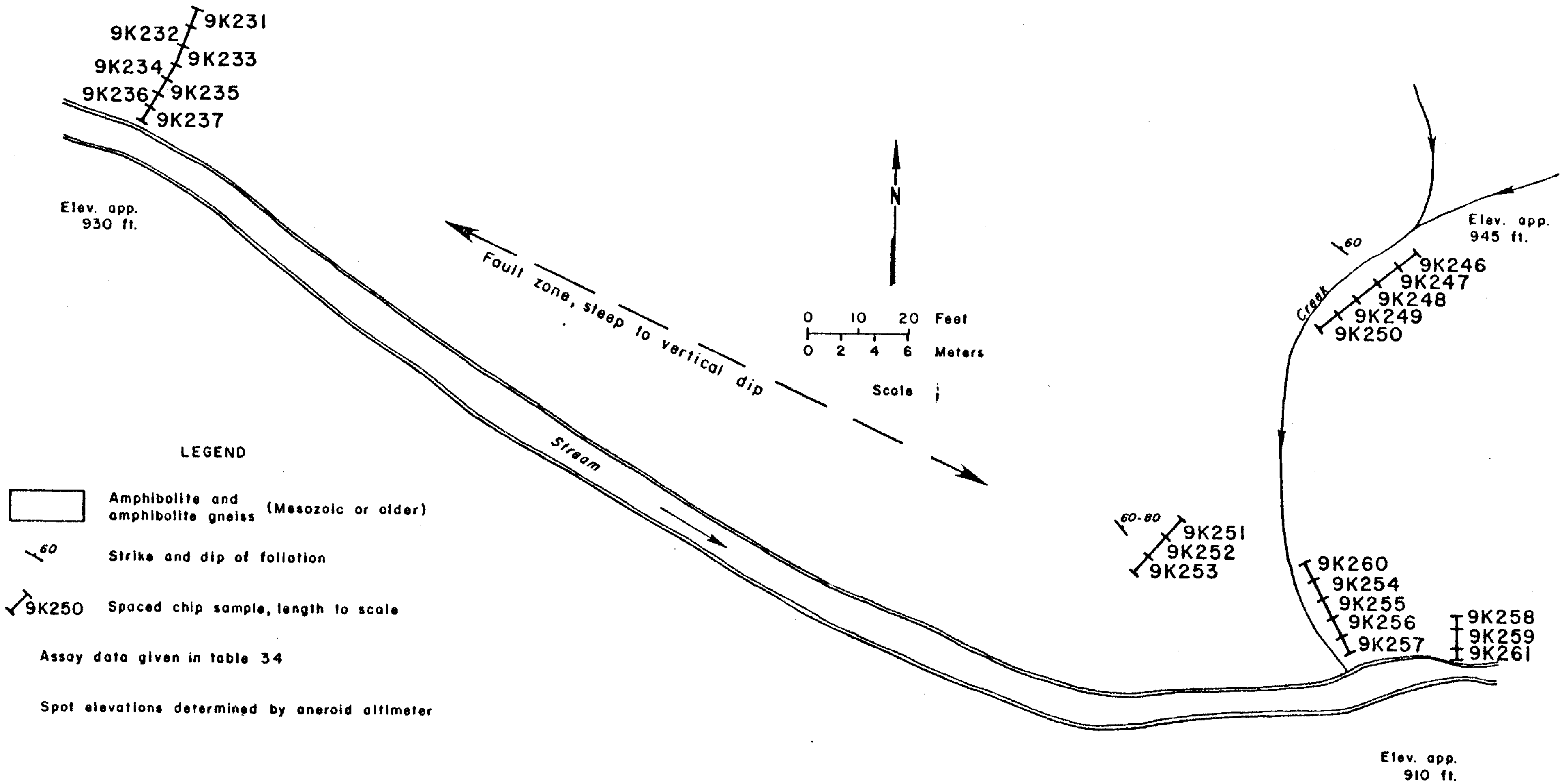


FIGURE 24.- Cable claims, canyon sample locations

TABLE 34. Assay Data, Cable Claims

Sample	Type	Sample Length Feet	Sample Length (M)	Analysis PPM AAS Au	AAS Cu	AAS Zn	Spec Ag	Description
Tent frame outcrop, elevation 910-930 ft.								
9K199				N	700	270	3	
9K231	Spaced Chip.5ft interval	5	1.5	N	35	20	N	The zones sampled comprise gneissic and schistose rocks containing disseminated sulfides, mainly pyrite. Rocks are locally sheared and heavily iron-stained. Some are silicified, others are heavily sericitic and chloritic.
9K232	do.	5	1.5	N	10	25	N	
9K233	do.	5	1.5	N	5	L	N	
9K234	do.	5	1.5	N	25	15	N	
9K235	do.	5	1.5	N	35	60	N	
9K236	do.	5	1.5	N	40	50	N	
9K237	do.	5	1.5	N	45	95	5	
9K246	do.	5	1.5	N	2200	770	2	
9K247	do.	5	1.5	N	510	400	0.5	
9K248	do.	5	1.5	N	560	140	N	
9K249	do.	5	1.5	N	420	100	N	
9K250	do.	5	1.5	N	930	910	.5	
9K251	do.	5	1.5	N	85	130	N	
9K252	do.	5	1.5	N	95	120	.5	
9K253	do.	4.5	1.4	N	150	160	1	
9K254	do.	4.5	1.4	0.1	1200	4800	5	
9K255	do.	5	1.5	N	270	280	3	
9K256	do.	5	1.5	N	55	110	N	
9K257	do.	4.5	1.4	N	45	300	N	
9K258	do.	3	.9	N	270	140	1	
9K259	do.	4	1.2	L	1000	1400	3	
9K260	do.	4.5	1.4	L	550	210	1	
9K261	do.	2	0.6	0.10	1600	3300	3	
Lower outcrop, elevation 850 ft.								
9K238	Stream sediment	-	-				N	-
9K239	Spaced Chip.5ft interval	4	1.2	N	15	40	N	Sheared and foliated iron-stained gneissic rocks with pyrite
9K240	do.	5	1.5	0.1	15	55	N	do.
9K241	do.	5	1.5	N	10	55	N	do.
9K242	do.	2.5	0.8	N	10	40	N	do.
9K243	do.	4.5	1.4	N	160	120	N	do.
9K244	Select Grab	-	-	0.15	4000	870	7	Iron-stained chlorite and quartz float with pyrite and chalcopyrite
9K245	Spaced Chip.5ft interval	4.5	1.4	0.05	20	70	N	Sheared and foliated iron-stained rocks w/pyrite

TABLE 34. Assay Data, Cable Claims (cont.)

Sample	Type	Sample Length Feet	Sample Length (M)	Analysis PPM AAS Au	AAS Cu	AAS Zn	Spec Ag	Description
								South extenstion (Otter Creek)
9K483	Pan concentrate	-	-					Stream sediment
9K484	do.	-	-					do.
9K485	do.	-	-					do.
9K486	do.	-	-					do.
9K494	do.	-	-					do.
9K487	Select Grab	-	-	<.02	78	42		Foliated, iron-stained siliceous rocks w/pyrite & pyrrhotite
9K488	Spaced Chip.5ft interval	4.5	1.4	<.02	134	37		do.
9K489	do.	2	0.6	<.02	23	66		Foliated,siliceous rocks w/ pyrite & pyrrhotite
9K490	do.	2.5	0.8	<.02	74	32		Foliated,iron-stained siliceous rocks w/pyrite & pyrrhotite
9K491	Select composite	-	-	<.02	55	24		Foliated,iron-stained siliceous rocks w/pyrite
9K492	Chip	1.3	0.4	<.02	124	21		do.
9K493	Select composite	-	-	<.02	76	20		do.
								Ridge of SE edge of claim group
9K578	Select			<.02	23	51		Iron-stained pyritic float
9K579 1/	Composite Grab			0.10	640	63	9	Gossan float
9K580	do.			<.02	410	40		Altered metadiorite with pyrite following planes of foliation

1/ Sample contained 420 ppm Mo by Spec. analysis of the other iron stained rocks in the fault zone that were sampled were barren. All of the intensely iron stained rocks seen in the area appear to lie in the fault zone or to be closely allied with it.

Assays of samples collected during the present study from this section near the northwest end of the trough (near the old tent site) show a maximum of 0.22 percent copper across a 5 foot width nearly normal to foliation, and 0.48 percent zinc across another 5 foot width. Minor silver and trace gold are present. These and other assays are given in table 34 and locations of most of the samples obtained are shown in the figures 23 and 24 cited. Samples 9K246-261 were collected in measured widths from intermittent exposures in a stratigraphic section nearly 80 feet wide. Most of the rocks in the fault zone are siliceous, pyritic, chloritic, and are heavily oxidized. The rocks are somewhat contorted structurally, however, local strike is reasonably consistently N45° to 60°W and dip is 60°-80°NE. Two nearby sections in the fault zone were also sampled. A large bluff of heavily oxidized rocks 300 feet upstream to the northwest yielded no significant metal values (samples 9K231-237). A less intensely oxidized stratigraphic section was sampled 800 feet downstream to the southeast at an elevation of 850 feet (samples 9K238-245). These last sample locations are not shown in a detailed illustration. Between these occurrences, although the ravine (or canyon) walls are steep, they are not vertical and outcrops are poorly exposed or are absent altogether.

The fault zone and the foliation in the metamorphic rocks do not strike quite parallel to one another, which may explain why one exposure in the fault zone is copper bearing and another is not, and that base metal concentrations along the fault appear to be selectively associated with certain lithologic horizons.

The stream in the northwestern part of the trough is parallel to the fault zone whose oxidized outcrops occur in the north bank. The stream crosses the contact between diorite and metamorphic rocks about 400 yards upstream to the northwest of the tent site copper occurrence, where the contact is obscured by diorite rubble. In the vicinity of the tent site occurrence the diorite contact is probably not far to the south, but does not occur in the ravine. The contact as shown by Rossman (1959) is 200 yards to the south. Whether the proximity of dioritic rocks to the south influenced the copper mineralization is not known, however, pyritic pods more than a foot across were seen in the metamorphic rocks a short distance downstream from the contact. Such occurrences may have been the source of stream float yielding 0.4 percent copper, the highest assay obtained. This specimen, composed of chlorite quartz and pyrite and a small amount of chalcopyrite, was rounded, tough and hard and probably did not come from the tent site locality, but from upstream. The potential for finding more extensive deposits of copper and zinc in this structural setting is probably good.

The 18 lode claims of the Cable group located in 1974 were allowed to lapse during the next couple of years, however, the decision to do so may have been an administrative one and not necessarily related to merit of the deposit. The occurrence was later relocated by another party. The claims were recorded as required with the U.S. Bureau of Land Management and are presently active.

Stag Bay Copper and Magnetite

Mining claims were first located in 1921 on a small copper bearing skarn zone near the 1,650 foot elevation on the north shoulder of Mt. Hill, and one mile south of the mouth of Stag Bay (plate 1). A small magnetite deposit is situated about 2,000 feet southeast of the copper prospect between the 700 and 750 foot elevation on the east slope of Mt. Hill and was first reported about 1941. Both occurrences lie in or adjacent to a N20°W striking fault which obliquely crosses the north shoulder of Mt. Hill. A Tertiary (?) diorite pluton, mainly on the west side of this ridge, has intruded the Triassic Goon Dip Greenstone of the area.

Stag Bay Copper Prospect

Copper minerals occur in a 150 foot wide trough formed where the steep dipping to vertical fault zone crosses the open shoulder of Mt. Hill above timberline. Heavily oxidized skarn containing magnetite and chalcopyrite is exposed by three open cuts or pits numbered 1, 2, and 3 in figure 25, and which have been opened for approximately 7, 20, and 40 feet respectively across the strike. The pits are spaced over a distance of about 500 feet along strike. The skarn does not outcrop and is exposed only where the three pits penetrate the overburden and rubble in the trough. The straight east wall of the trough is a vertical diorite cliff 10 to 20 feet high. The less abrupt west margin of the trough also appears to be diorite near the trenches. Rossman (1959) mapped more than 1000 feet of right lateral strike slip displacement of a part of the diorite body along the fault. He shows a narrow wedge of greenstone on the west side of the fault, extending toward or into the prospect area from the south along the greenstone - diorite fault contact. This greenstone is now considered to be Goon Dip Greenstone.

The rocks to the north of the trenches in the trough are obscured by overburden as far as a shallow elongate pond. The bedrock beyond the pond to the north is diorite. It is well exposed over a large area and is

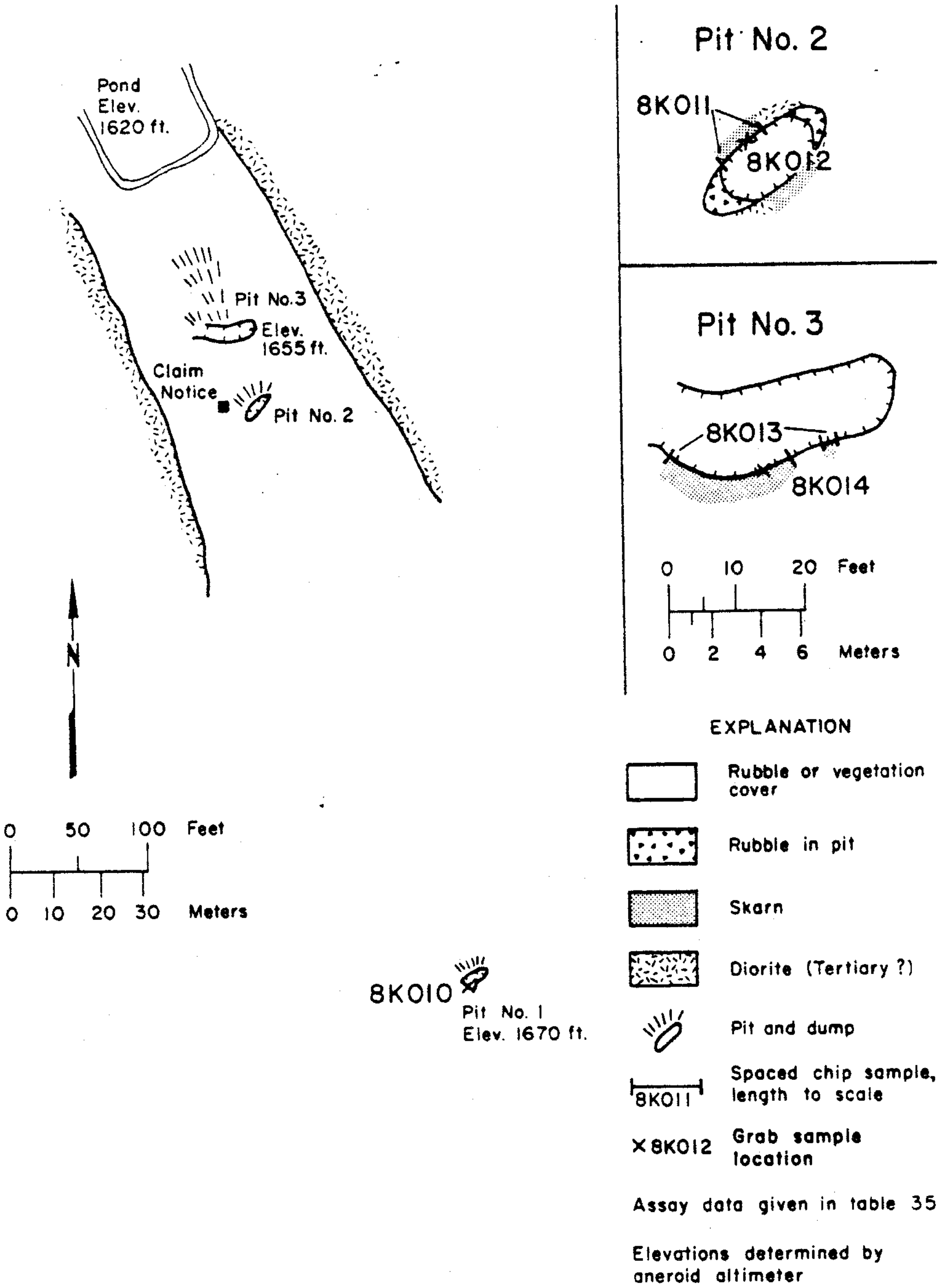


FIGURE 25. - Stag Bay copper prospect, sample locations

unmineralized. All rocks to the south of the open cuts are obscured along strike for hundreds of yards by overburden, rubble, and talus.

The prospect was visited briefly by Bureau of Mines engineers in 1963 and in 1978 during the present study. Analyses of samples obtained during both visits are given in table 35. Figure 25, previously cited, shows sample locations. The samples whose numbers are preceded by the letter "P" were taken in 1963. Copper assays of 0.60 and 1.07 percent copper were obtained from 7.9 and 4.2 foot widths respectively across the same exposure in trench No. 2 and gave the highest copper assays that were obtained. Minor gold and silver were also reported. Samples from trenches numbered 1 and 3 gave significantly lower assay values.

The host rock in trench No. 2 is reported to be diorite (field identification). That in trenches 1 and 3 was not identified. The full width of the skarn and gossan is nearly 10 feet in trench No. 2. The more massive core containing magnetite and chalcopyrite has a width of 4 feet or less. Some scheelite is present. Gangue is predominantly hornblend (or actinolite) and epidote with lesser diopside and garnet. Chlorite, quartz and limonite are present.

To recapitulate, the mineralization evidently occurs in a fault zone at or near the contact between greenstone and diorite and does not extend to the north beyond the pond, where the fault is wholly in diorite. To the south, any mineralization would be completely obscured and would be very difficult to trace. Anomalous copper is found over a strike length of 500 feet. However, continuity between pits is not established and the highest assays come from a single locality. Depth of mineralization is unknown.

TABLE 35. Assay data, Stag Bay Copper prospect

Sample	Type	Sample Length		Analysis								Description
				PPM				Percent		Oz./Ton		
				AAS	AAS	Spec	Spec	Spec	Chemical	Fire Assay		
		Feet	(M)	Cu	Au	W	Ag	Fe	Cu	Au	Ag	
8K010	Select Grab	-	-	460	N	N	L	5	-	-	-	Skarn with sulfides
8K011 1/	Spaced Chip.5ft interval	7.9	2.4	6000	0.15	70	10	20	-	-	-	Amphibolite skarn w/chalcopyrite, scheelite and magnetite
8K012	Select Grab	-	-	6000	.20	L	7	20	-	-	-	Amphibolite skarn w/chalcopyrite, magnetite, sphalerite and pyrite
8K013 2/	Spaced Chip.5ft interval	22.0	6.7	320	N	N	N	10	-	-	-	Skarn
8K014	Select Grab	-	-	260	.10	N	N	5	-	-	-	do.
P-707	Channel	3.0	0.9	-	-	-	-	-	0.39	Tr	0.08	Skarn with chalcopyrite
P-708	do.	4.2	1.3	-	-	-	-	-	1.07	0.02	.23	Skarn with chalcopyrite magnetite & scheelite
P-709	do.	5.8	1.8	-	-	-	-	-	.03	Tr	N	Skarn with chalcopyrite & magnetite
P-710	do.	13.9	4.2	-	-	-	-	-	N	Tr	N	Skarn with chalcopyrite
P-711	do.	6.0	1.8	-	-	-	-	-	.03	Tr	N	Skarn

1/ Sample 8K011 is cut from the P-707 plus P-708 sample section
2/ Sample 8K013 is cut from the P-709 plus P-710 plus P-711 sample section

Stag Bay Magnetite Prospect

A small magnetite deposit is situated 3/4 mile south of Stag Bay on the east slope of Mt. Hill between the elevations of 700 and 750 feet, and is about 2,000 feet southeast of the copper prospect just described. The deposit was first located in about 1941. Mining claim history is vague as the magnetite was variously covered by the same claim groups that located the Stag Bay copper prospect to the northwest.

Twenhofel, Reed, and Gates (1949) briefly discussed the deposit based on a short visit by Kennedy in 1942, who was then working in the Bohemia Basin area on Yakobi Island. Mineralization constituting mainly magnetite with lesser epidote and quartz, and with a little pyrite and chalcopyrite had been exposed in two trenches totalling about 100 feet in length. It was suggested that a magnetic survey precede further development.

Bureau of Mines engineers visited the deposit in 1963, and again in 1978 during the present study. Samples were obtained from two trenches in 1963 and in 1978 and are probably from the trenches reported by Kennedy. A third trench to the east was sloughed and was not sampled. Table 36 gives sample analyses and figure 26 shows sample locations and the results of the 1963 Sharpe A-3 magnetometer survey of the immediate prospect vicinity.

A sharp and intense magnetic anomaly was measured in the area explored by trenching and suggests that a small high grade magnetite body lies at or near the surface. All distinctly anomalous magnetic readings were taken within an area less than 60 feet in diameter from which seven channel samples assaying 33 to 49 percent soluble iron or about 45 or 70 percent magnetite, were obtained. The structure at the deposit appears to strike east to northeast.

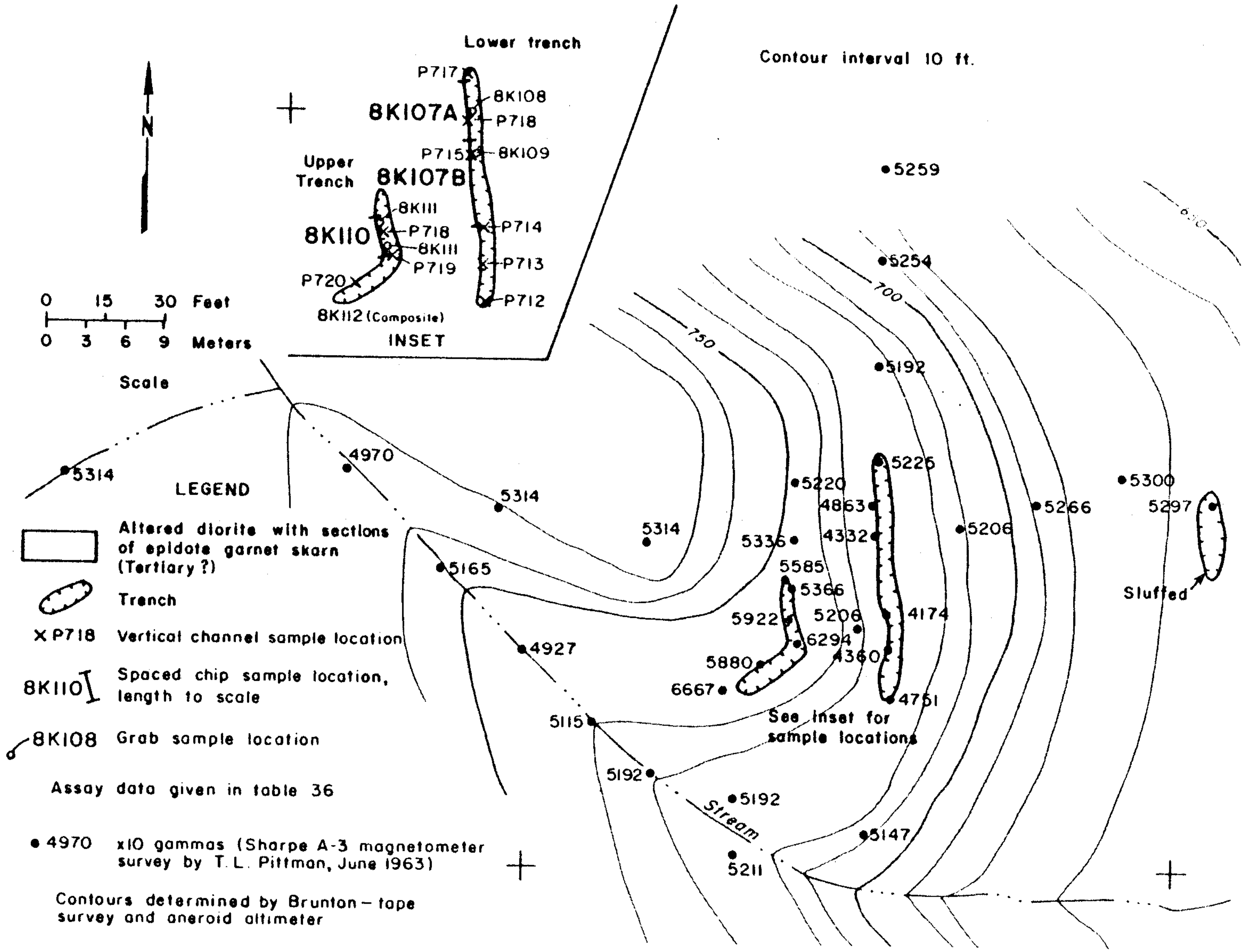


FIGURE 26. - Stag Bay magnetite prospect, sample locations

TABLE 36. - Assay data, Stag Bay Magnetite Prospect

Sample	Type	Sample Length 1/ Feet	Sample Length 1/ (M)	Analysis, Percent, Chemical: Acid soluble Fe	Analysis, Percent, Chemical: Insoluble Fe	Analysis, Percent, Chemical: Total Fe	Analysis, Percent, Chemical: TiOz	Analysis, Percent, Chemical: Cu 1/	Analysis, Percent, Spec: Fe	Analysis, Percent, Spec: Ti	Analysis, PPM AAS: Cu	Analysis, Oz/Ton Fire Assay: Au	Analysis, Oz/Ton Fire Assay: Ag	Description
Lower Trench														
8K107A	Spaced Chip 0.5 ft. interval	14.2	4.3	-	-	-	-	-	20	0.07	220	-	-	Skarn w/pyrite, magnetite and chalcopyrite
8K107B	do.	20.7	6.3	-	-	-	-	-	20	0.07	55	-	-	do.
8K108	Select Grab	-	-	-	-	-	-	-	20	0.07	230	-	-	do.
8K109	do.	-	-	-	-	-	-	-	15	0.05	210	-	-	do.
P-712	Channel	4.3	1.3	35.5	3.18	38.7	0.05	0.01	-	-	-	N	N	Description is not Available
P-713	do.	4.5	1.4	41.7	2.42	44.1	0.12	N	-	-	-	N	0.02	
P-714	do.	4.6	1.4	39.5	2.58	42.1	0.12	0.01	-	-	-	N	N	
P-715	do.	3.9	1.2	36.4	3.03	39.4	0.10	0.01	-	-	-	N	0.01	
P-716	do.	4.5	1.4	19.9	3.23	23.1	0.04	0.01	-	-	-	N	0.03	
P-717	do.	4.6	1.4	5.5	4.09	9.6	0.93	0.01	-	-	-	N	0.06	
Upper Trench														
8K110	Spaced chip 0.5 ft interval	11.2	3.4	-	-	-	-	-	G 20	0.15	55	-	-	Skarn with magnetite and pyrite
8K111	Select Grab	-	-	-	-	-	-	-	G 20	0.05	60	-	-	do.
8K112	do.	-	-	-	-	-	-	-	G 20	0.1	60	-	-	do.
P-718	Channel	4.7	1.4	33.1	4.44	37.5	0.41	N	-	-	-	N	N	Description is not Available
P-719	do.	5.6	1.7	42.4	2.32	44.7	0.14	N	-	-	-	N	N	
P-720	do.	5.0	1.5	49.0	2.32	51.3	0.01	N	-	-	-	N	N	

1/ "P" sample lengths are vertical, other lengths are horizontal

The high iron parts of the zone contain 40-70 percent magnetite and are otherwise made up largely of hornblende, epidote, quartz, garnet and pyrite. Traces of chalcopyrite are present. Host rocks appear to be diorite to gabbro in composition. Rossman (1959), however, reported a marble sequence too small to map (mile to inch) near the magnetite deposit.

The mineral assemblage at each of these deposits and the physical circumstances under which they occur are strikingly similar. Both are magnetite and copper bearing skarn deposits in or adjacent to a fault zone at or near the contact between dioritic rocks with metasedimentary and/or metavolcanic rocks. They appear to be closely genetically related, and occur as two exposures of a single deposit, or more likely as separate deposits in two similar local geologic settings along the same fault zone.

Slim and Jim Prospect

The 11 inactive Slim and Jim claims located in 1916 were situated a mile east of the south entrance of Lisianski Strait and extended from Canoe Pass southwesterly to Islas Bay on the outer coast (plate 1 and figure 27). A copper bearing iron stained shear zone in graywacke, on a small island near Point Urey, was examined in 1917 (Storm, 1917, unpublished report, see figure 28). The nearly vertical shear zone is about 12 feet wide at the widest place but is much narrower throughout most of its exposure length. The island on which it occurs has an area of about one acre.

The copper bearing zone has been traced for 200 feet along the nearly due north strike. Samples taken across the zone in 1978 show 1.0 percent copper across a 6.9 foot width and 0.7 percent across a 9.4 foot width

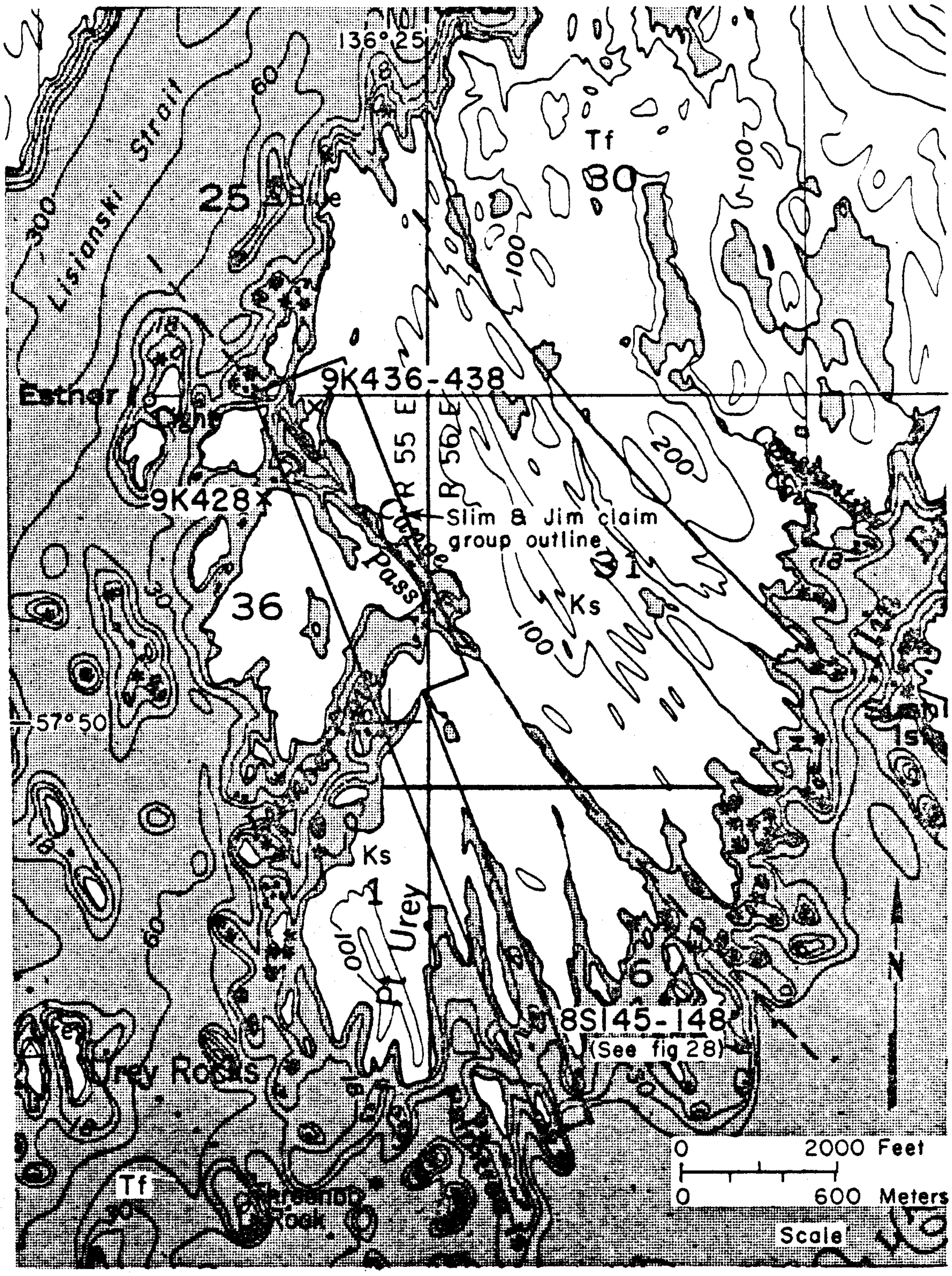


FIGURE 27. - Slim and Jim claims, sample locations (Geology from Johnson and Karl, 1982)

LEGEND

Tf	Felsic plutonic rocks (Tertiary ?)
Ks	Graywacke, hornfels, and gneiss (Cretaceous)
— —.....	Approximate contact, dotted where concealed
— — — —	Inferred fault
x9K428	Sample location

Assay data given in table 37

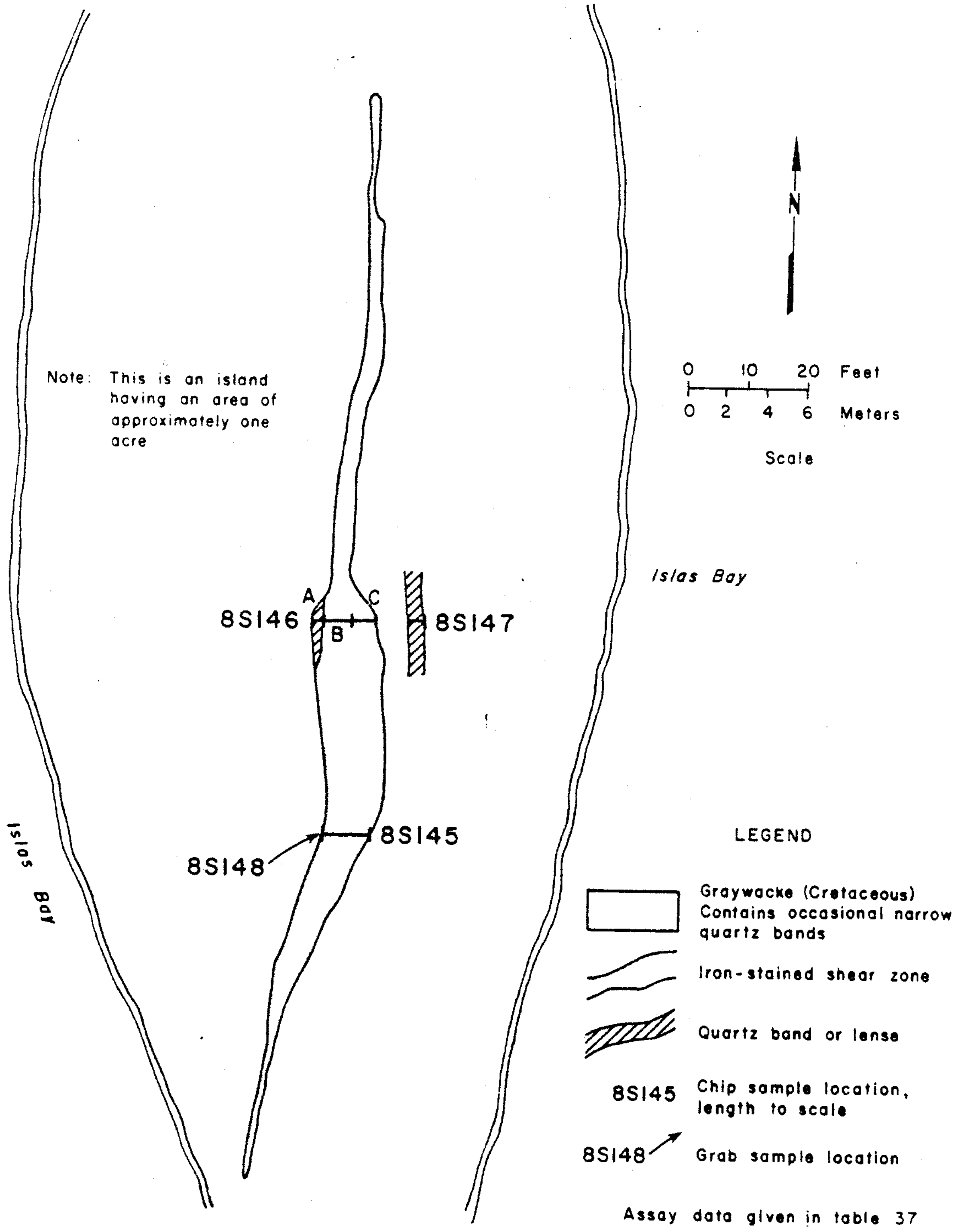


FIGURE 28. - South end of Slim and Jim claims, sample locations
Base from Storm, 1917)

TABLE 37. Assay data, Slim and Jim claims

Sample	Type	Sample Length Feet	Sample Length (M)	Analysis PPM AAS Au	AAS Cu	AAS Zn	Spec Co	Spec Mo	Spec Ni			Description
9K428	Select Grab	-	-	0.05	203	20	15	N	20			Iron-stained shear zone in graywacke with sulfides
9K436	Chip	1.0	0.3	N	1600	45	50	10	200			do.
9K437	Select Grab	-	-	N	330	55	20	N	70			do.
9K438	Chip	0.3	0.09	N	10	5	5	N	5			Quartz vein on hanging wall of above zone
8S145	do.	6.9	2.1	N	10000	3100	100	N	50			Altered andesite w/pyrite chalcopyrite and pyrrhotite
8S146A	do.	1.4	0.4	N	85	90	20	N	50			Quartz vein
8S146B	Spaced Chip.25ft interval	5.0	1.5	N	5000	2800	30	N	50			Altered andesite w/pyrite chalcopyrite and pyrrhotite
8S146C	Chip	4.4	1.3	L	9300	2400	200	N	100			do.
8S147	do.	2.2	0.7	0.10	180	40	15	30	30			Quart vein w/chalcopyrite
8S148	Select Grab	-	-	0.05	8700	1300	200	50	100			Altered andesite w/pyrite chalcopyrite and pyrrhotite

35 feet north and outline the dimensions of the main mineralized section of the zone (table 37). Up to 0.3 percent zinc is present. Gold values range from nil to 0.003 oz. per ton. Inspection of the Chichagof Island shoreline near the island with mineralization revealed no mineralized zones in the graywacke on the larger island shore.

The Canoe Pass area along the axis of the claim group (along strike of the shear zone) was searched for similar mineralization, where the rocks were reasonably well exposed. A narrow northwest striking shear zone was found on the north shore of Canoe Pass (figure 27). Samples were taken of the shear zone. An analysis of 0.16 percent copper was obtained from 1.0 foot width of the zone where the zone was widest, and where it was most pyritic. Other samples contained lower copper values. Gold was not detected. No other mineralization was noted, although rocks along the shoreline are well exposed.

Other Copper Occurrences

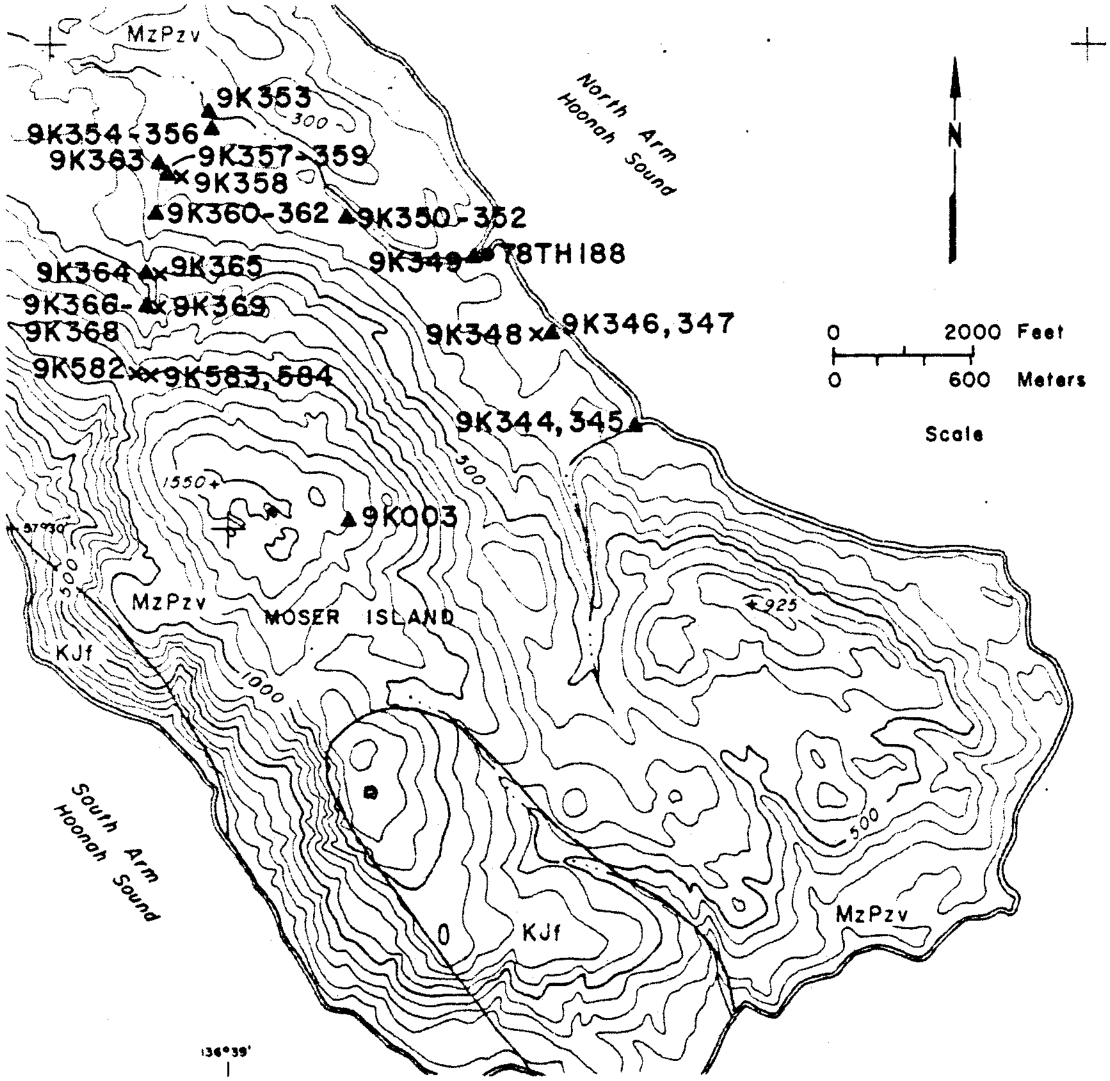
A 1978 U.S. Geological Survey stream survey pan concentrate sample from the mouth of the largest drainage on the northeast side of Moser Island in Hoonah Sound was reported to contain 500-2000 ppm copper, and 500 ppm zinc. Chalcopyrite and cuprite were identified in the concentrates. This drainage is wholly within a sequence of Mesozoic and Paleozoic(?) metamorphic rocks. The anomalous samples were followed up by the Bureau of Mines in 1979 using a biquinoline field method for determining the relative semi-quantitative copper values in stream pan concentrates in the field. Pan concentrate, float, and outcrop samples were collected progressively upstream in search of a copper or zinc source. Heavily oxidized pyritic gneiss in the top of the drainage did not reveal strongly anomalous copper or zinc values, although the biquinoline copper field tests indicated weakly anomalous copper in samples taken progressively up this drainage. Several float samples yielded marginally anomalous copper background. Figure 29 gives sampled localities while table 38 shows laboratory analyses for copper and zinc, and of selected samples for gold and silver.

Heavily pyritic schist occurs in a steep gully entering Hoonah Sound from the south, a mile northwest of Moser Island, possibly the site of the inactive Ophir claims. Two spaced chip samples and a heavily pyritic grab sample yielded no base or precious metal values of consequence (table 39).

Uranium Investigation

Anomalous uranium was reported by the U.S. Geological Survey (Hessin and others, in preparation) in water and/or stream sediment samples from 41 of 343 sites from which samples were obtained in 1978 (table 40). All 41 sites lie within the southern half of the study area (figure 30). A Bureau of Mines water and stream sediment sampling program was undertaken in 1979 in order to specifically identify and sample some of the possible uranium source areas. Seventy-five water samples and 105 samples of rock and stream sediment were collected at U.S. Geological Survey sites, and upstream from them in order to delineate source areas. Methods of collection, sampling, and handling recommended by Skyline Laboratories who analyzed the samples, were employed (table 41).

One water sample was anomalous. This sample and the two stream sediment samples yielding the highest uranium analyses came from the immediate



LEGEND

KJf	Tonalite (Jurassic or Cretaceous)	MzPzv	Turbidites, volcaniclastic sediments and greenstone (Mesozoic or Paleozoic)
———	Contact	● 78TH188	U.S.G.S. stream sediment sample with significant copper values
▲ 9K353	Stream sediment or stream float sample	× 9K582	Sample of outcrop

Assay data given in table 38

FIGURE 29.- Moser Island and vicinity, sample locations

TABLE 38. Assay data, Moser Island

Sample	Type	Sample Length Feet	Sample Length (M)	Analysis PPM AAS Cu	Analysis PPM AAS Zn	Description
9K003A	Stream sediment	-	-	30	70	-
9K003B	do.	-	-	35	45	-
9K344	do.	-	-	80	30	-
9K345[1/]	Select Grab	-	-	260	15	Epidosite w/pyrite (float)
9K346	Stream sediment	-	-	125	75	-
9K347	do.	-	-	125	80	Detritus includes epidosite
9K348	Select Grab	-	-	250	45	Iron-stained andesite with pyrite(outcrop)
9K349	Stream sediment	-	-	110	120	Detritus includes epidosite
9K350	do.	-	-	60	70	
9K352	Select Grab	-	-	225	45	Andesite with minor sulfides (float)
9K353	Stream sediment	-	-	70	80	-
9K354	do.	-	-	50	75	-
9K355	Select Grab	-	-	15	5	Epidosite (float)
9K356	do.	-	-	70	40	Iron-stained greenstone (float)
9K357	Stream sediment	-	-	85	80	-
9K358	Select Grab	-	-	70	45	Iron-stained greenstone (outcrop)
9K359	do.	-	-	80	40	Amphibolite with pyrite (float)
9K360	do.	-	-	70	70	Phyllite w/lenses of pyrite float
9K361	Stream sediment	-	-	150	110	-
9K362	do.	-	-	155	115	-
9K363	do.	-	-	95	145	Detritus includes amphibolite
9K364	do.	-	-	180	165	-
9K365[2/]	Spaced Chip.5ft interval	6.5	2.0	150	190	Chlorite schist with pyrite (outcrop)
9K366	Select composite	-	-	35	30	do.
9K367	Stream sediment	-	-	90	140	-
9K368	do	-	-	150	150	-
9K369	Spaced Chip 1ft interval	15	4.6	60	30	Quartz diorite (outcrop)

TABLE 38. Assay data Moser Island (cont.)

Sample	Type	Sample Length		Analysis PPM		Fire Assay		Description
				AAS	AAS			
		Feet	(M)	Cu	Zn	Au	Ag	
9K582	Composite Grab	-	-	172	76	Nil	Nil	Gneiss, pyrite (outcrop)
9K583 3/	do.	-	-	102	58	Nil	Nil	do.
9K584	do.	-	-	117	63	Nil	Nil	do.

1/ Sample contained 0.10 ppm Au by AAS analysis
2/ Sample contained 150 ppm B by spec analysis
3/ Sample contained 0.02 ppm Au by AAS analysis

TABLE 39. Assay data, Ophir claim

Sample	Type	Sample Length		Analysis					Description
				PPM			Oz./Ton		
				Spec	Spec	Spec	Fire Assay		
		Feet	(M)	Cu	Pb	Zn	Au	Ag	
8K098	Spaced Chip.5ft interval	6.4	2.0	15	15	45	Nil	Nil	Schist with pyrite
8K099	Spaced Chip 1ft interval	4.8	1.5	55	15	65	Nil	Nil	do.
8K100	Select Grab	-	-	50	15	70	Nil	Nil	Sulfide-rich zone in schist

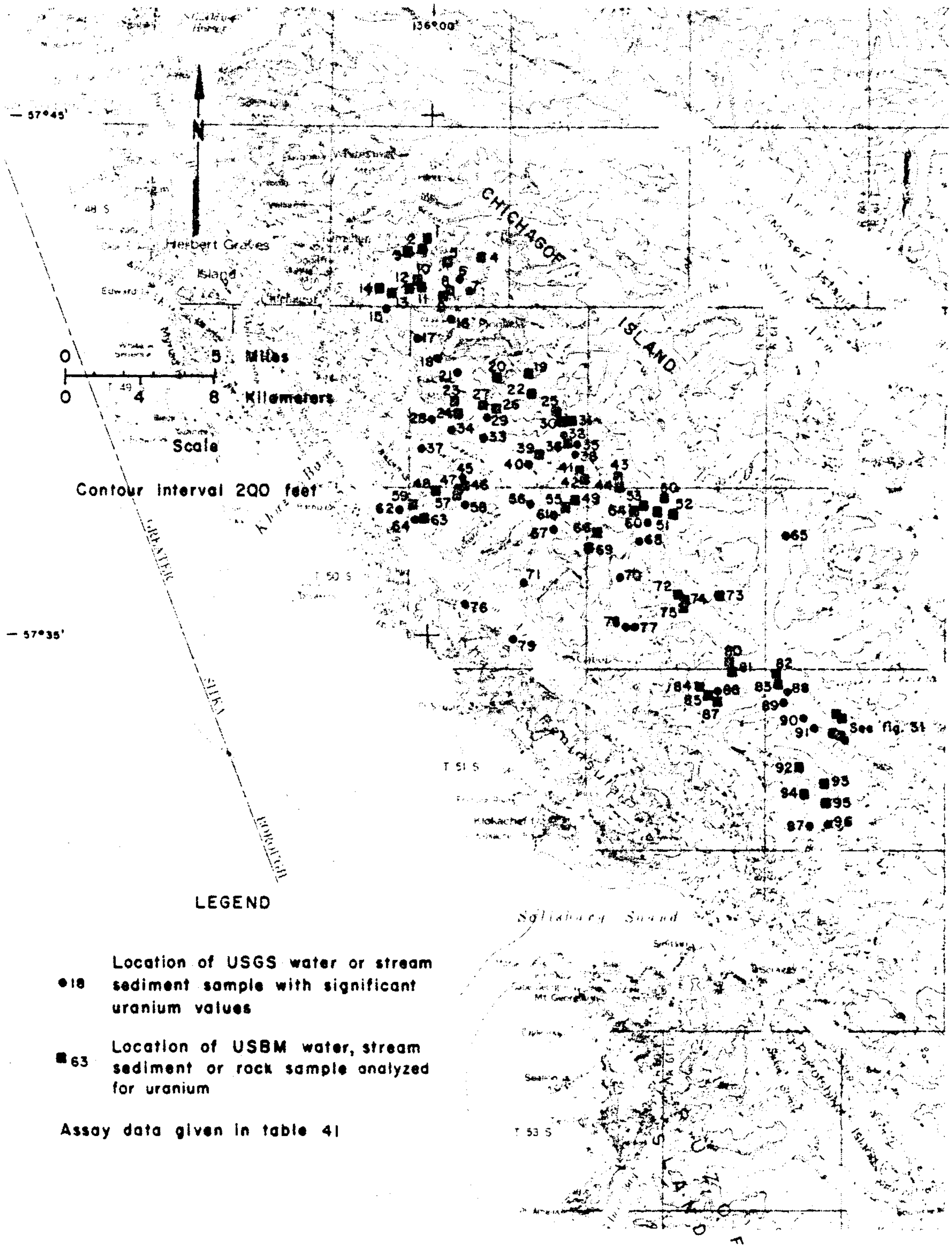


FIGURE 30. - Uranium investigations, sample locations (Base adapted from USGS 1:250,000 scale Sitka quad.)

TABLE 40. Assay data, Geological Survey anomalous Uranium analyses

		Uranium, PPM	
Figure 30 No.	U.S. Geol. Survey Site No. (78 TH)	Stream Sediment Sample	Filtered Water Sample
6	275	1.0 - 20.0	0.0005 - 0.0006
7	274	-	0.0005 - 0.0006
15	278	0.4 - 0.9	0.0005 - 0.0006
16	276	-	0.0004
17	277	-	0.0004
18	272	1.0 - 20.0	0.0004
19	270	-	0.0004
21	271	0.4 - 0.9	-
28	263	1.0 - 20.0	0.0004
29	265	0.4 - 0.9	0.0007 - 0.0043
32	248	0.4 - 0.9	-
33	266	1.0 - 20.0	0.0004
34	264	0.4 - 0.9	-
35	247	0.4 - 0.9	0.0007 - 0.0043
37	262	-	0.0004
38	246	-	0.0004
40	249	1.0 - 20.0	0.0007 - 0.0043
45	267		0.0004
56	245	0.4 - 0.9	0.0007 - 0.0043
58	242	0.4 - 0.9	0.0004
60	251	0.4 - 0.9	0.0004
61	243	-	0.0005 - 0.0006
62	261	-	0.0004
64	260	-	0.0005 - 0.0006
65	332	1.0 - 20.0	-
67	244	0.4 - 0.9	0.0004
68	253	0.4 - 0.9	-
70	255	0.4 - 0.9	-
71	238	1.0 - 20.0	0.0007 - 0.0043
76	239	1.0 - 20.0	0.0004
77	256	0.4 - 0.9	0.0007 - 0.0043
78	257	0.4 - 0.9	-
79	237	1.0 - 20.0	-
86	321	0.4 - 0.9	-
88	306	1.0 - 20.0	0.0007 - 0.0043
89	307	1.0 - 20.0	-
90	305	1.0 - 20.0	0.0007 - 0.0043
91	311	-	0.0007 - 0.0043
96	301	-	0.0007 - 0.0043
97	300	1.0 - 20.0	-

TABLE 41. Assay data, Uranium samples

Figure 30 No.	Sample	Type	Analysis PPM 1N HNO_3 U	Total U	Description
1	9K029	Stream sediment	N	1.4	Stream float includes epidosite
2	9K027	do.	0.4	1.0	Stream float includes phyllite and greenstone
3	9K025	do.	0.2	3.2	Stream float includes phyllite
4	9K037	do.	-	1.5	-
4	9K039	do.	-	1.6	-
5	9K035	do.	-	1.4	Detritus includes chert,greenstone, gneiss,chorite,schist and serpentine
8	9K033	do.	-	2.2	-
9	9K031	do.	-	1.6	-
10	9K021	do.	-	2.8	-
11	9K023	do.	-	1.8	-
12	9K019	do.	-	1.6	Detritus predominantly meta-andesite
13	9K017	do.	0.5	1.3	-
14	9K015	do.	0.4	2.2	Stream float includes phyllite and greenstone
20	9K041	do.	-	11	Stream float includes red jasper. Detritus includes chlorite schist, meta-andesite and diorite
22	9K088	do.	-	1.4	Detritus includes greenstone and altered andesite
23	9K083	do.	1.9	0.9	-
24	9K085	do.	-	0.8	Greenstone in coarse fraction
25	9K078	do.	-	1.5	Detritus includes diorite,meta-andesite,meta-graywacke
25	9K080	do.	-	1.4	Detritus includes greenstone,meta-andesite,chlorite schist
26	9K045	do.	-	1.5	-
27	9K043	do.	0.3	1.2	-
30	9K059	do.	-	1.2	-
31	9K055	do.	-	1.4	-
39	9K091	do.	-	1.4	Detritus includes chert,greenstone, meta-andesite
41	9K063	do.	-	1.2	Detritus includes catactastic andesite and greenstone
41	9K064	Composite Grab	-	0.5	Red jasper (stream float)
42	9K066	Stream sediment	-	0.8	-
42	9K068	do.	-	1.3	Red jasper,red chert,greenstone fragments

TABLE 41. Assay data, Uranium samples (cont.)

Figure 30 No.	Sample	Type	Analysis PPM 1N HNO_3 U	Total U	Description
43	9K075	Stream sediment	-	0.8	Detritus includes amphibolite
44	9K071	do.	-	1.4	Phyllite schist and greenstone fragments
44	9K073	do.	0.5	1.2	
46 & 47	9K095	Composite Grab	-	1.5	Graywacke (outcrop)
	9K096	do.	-	1.4	do.
	9K097	do.	-	2.2	do.
	9K098	do.	-	1.5	do.
48	9K046	do.	-	1.7	do.
48	9K047	do.	-	2.8	do.
48	9K048	do.	-	1.8	do.
48	9K049	do.	-	1.6	do.
49	9K105	Stream sediment	-	1.4	-
49	9K106	Composite Grab	-	1.0	Red jasper (stream float)
51	9K113	Stream sediment	-	1.2	-
51	9K114	Composite Grab	-	1.4	Iron-stained muscovite schist with pyrrhotite
52	9K117	Stream sediment	-	1.3	-
53	9K119	do.	-	0.9	-
54	9K121	do.	-	1.4	Stream float includes syenite
54	9K122	Composite Grab	-	0.6	Limestone (stream float)
55	9K108	Stream sediment	-	1.3	Stream detritus includes meta-andesite
57	9K099	Composite Grab	-	2.2	Graywacke (outcrop)
57	9K100	do.	-	1.7	do.
59	9K053	Stream sediment	1.5	1.3	Graywacke fragments
63	9K051	do.	-	1.2	-
66	9K102	do.	-	1.1	Detritus includes red jasper & skarn
66	9K103	Composite Grab	-	0.5	Red jasper(stream float)
69	9K109	do.	-	0.8	Greenstone (outcrop)
69	9K110	do.	-	2.5	Aplite dikes (outcrop)
69	9K111	do.	-	0.3	Red jasper(stream float)

TABLE 41. Assay data, Uranium samples (cont.)

Figure 30 No.	Sample	Type	Analysis PPM 1N HNO_3 U	Analysis PPM Total U	Description
72	9K166	Stream sediment	-	1.1	Predominately amphibolite detritus
72	9K167	Composite Grab	-	<.2	Amphibolite outcrop
72	9K168	do.	-	<.2	Amphibolite outcrop
73	9K152	Stream sediment	-	0.7	Stream detritus include limestone, meta-soda trachyte,greenstone,diorite, amphibolite,chert,meta-andesite
74 &	9K169	Composite Grab	-	0.6	Amphibolite outcrop
75	9K174	do.	-	0.4	Amphibolite outcrop
80	9K142	Stream sediment	-	1.2	-
81	9K140	do.	-	0.9	-
82	9K136	do.	-	1.2	-
83	9K138	do.	-	0.9	-
84	9K145	Composite Grab	-	1.7	-
84	9K146	do.	-	0.9	-
84	9K147	do.	-	0.6	Amphibolite
85	9K144	Stream sediment	-	0.4	Detritus includes foliated grano-diorite,phyllite,amphibolite,quartz
87	9K149	do.	-	0.7	-
92	9K163	do.	0.4	1.0	-
92	9K164	Composite Grab	-	0.5	Meta diorite(stream float)
93	9K154	Stream sediment	0.6	0.6	-
93	9K155	Composite Grab	-	0.6	Foliated diorite(stream float)
94	9K160	Stream sediment	1.9	1.1	-
94	9K161	Composite Grab	-	0.6	Meta-diorite(stream float)
95	9K157	Stream sediment	-	0.5	Foliated quartz diorite,chert,meta-diorite,quartz,amphibolite detritus
95	9K158	Composite Grab	-	0.4	do.(stream float)

TABLE 41. Assay data, Uranium samples (cont.)

Figure 30 No.	Sample	Type	Analysis PPM 1N HNO_3 U	Total U	Description
	9K124	Stream sediment	-	5.8	-
	9K125	Composite Grab	-	0.6	Granodiorite (stream float)
	9K127	Stream sediment	-	2.1	-
	9K128	Composite Grab	-	7.0	Foliated granodiorite(stream float)
	9K129	do.	-	3.2	Foliated granodiorite outcrop
	9K130	do.	-	3.8	Pegmatitic dikes in granodiorite outcrop
	9K131	do.	-	1.1	Dark sericitic float (Tr Au & Ag by fire assay)
See Fig. 31	9K132	do.	-	1.4	Pegmatitic dikes outcrop
	9K134	Stream sediment	-	1.2	-
(Note Deep Bay)	9K420	Spaced Chip 2ft interval	-	4.5	Granodiorite to quartz monzonite (length 100 feet)
	9K421	do.	-	5.0	do. (length 30')Tr Au&Ag by fire assay
	9K422	Stream sediment	5.6	4.0	12.0 ppm Au by fire assay; 0.5 ppm Ag by spec.)
	9K423	do.	3.4	2.8	(0.1 ppm Au by AAS)
	9K424	do.	5.0	3.6	-
	9K425	do.	60	24	-
	9K426	do.	25	8.8	-

vicinity of the highest uranium values reported by Hessin during the 1978 sampling, namely from a very small drainage area on the north side of Deep Bay near its head (figure 31). Local rock is Tertiary(?) granodiorite and is cut by swarms of pegmatite and aplite dikes. Samplings of local rocks and especially the pegmatitic dikes however, did not reveal detectable uranium values. A Geiger counter carried in the area gave no anomalous reading. The dikes are mainly exposed on the upper mountain slope above timberline near the 1,500 foot elevation in the head of the drainage. Uranium content of the two anomalous U.S. Bureau of Mines stream sediment samples was considered to be too low for discrete uranium mineral identification by x-ray diffraction techniques in the Juneau laboratory. The uranium source material in the stream sediment samples has not been identified. The values however, were higher than those obtained in the most anomalous U.S. Geological Survey stream sediment sample and were by far the highest obtained from stream sediment samples within the study area. The source was not determined and although the drainage is very small, heavy vegetation, overburden, and slide rubble obscure the rocks at lower elevations.

Some of the numerous dikes within the Tertiary granodioritic rocks on the steep mountainside directly above the stream are pegmatitic and are considered to be a likely source of uranium even though the reconnaissance samples taken during this study did not reveal uranium. Hessin (in preparation) reported anomalous uranium samples from four other sites just northwest of the head of Deep Bay on a larger drainage. All four sites are well within the same Tertiary(?) granodiorite pluton of some 20 square

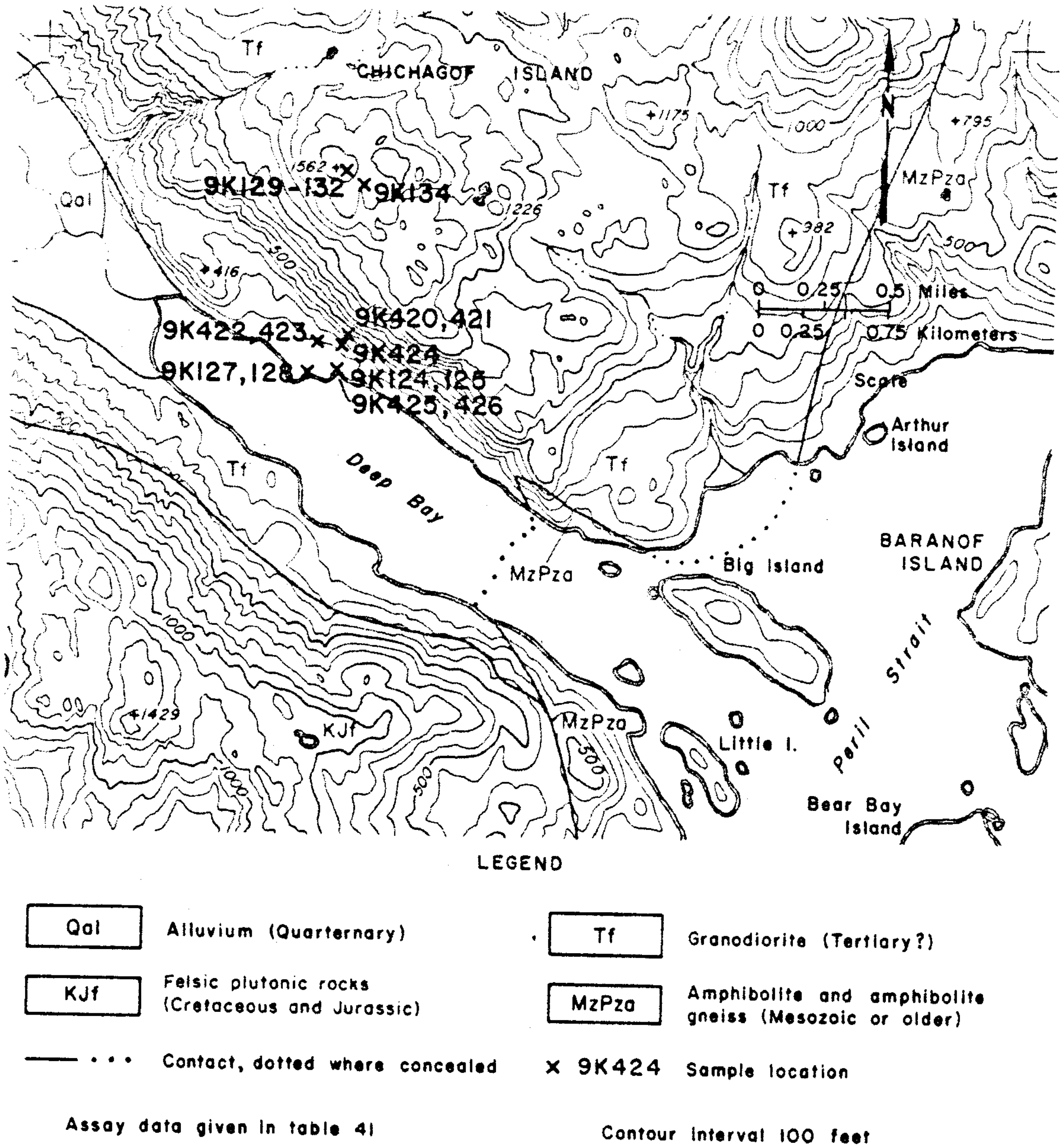


FIGURE 31. - Deep Bay, sample locations (Geology adapted from Johnson and Karl, 1982)

miles in extent. Further reconnaissance above timberline, of the Tertiary(?) pluton near Deep Bay, where many rocks are exposed, and more detailed examination of the pegmatite, should be made.

All anomalous uranium samples were obtained from the southwestern third of the area studied from drainages in the Tertiary(?) granodiorite, Cretaceous Kelp Bay metasediments and metavolcanics, and Cretaceous Sitka Graywacke. These three rock units are extensively exposed elsewhere within the study area where not a single anomalous uranium value was reported.

The National Uranium Resource Evaluation (NURE) program in 1976 and 1977 identified sites where uranium might be present in southeastern Alaska (LKB, 1979). The three sites, or areas, nearest Mt. Edgecumbe volcano are equidistant from it on Baranof and Chichagof Islands. One lies in the southernmost part of the study area not far from Deep Bay, although no stream sediments or water samples proved to be anomalous near that site during this study. Mt. Edgecumbe had major volcanic ash eruptions about 9,000 years ago, which were at least in part of dacitic composition (Brew and others, 1969). Possible trace uranium from volcanic ash could be more concentrated in the southern part of the study area and nearer to the source where heavier ash fall is known to have occurred, through decomposition of the ash and concentration of its possible trace uranium content. Acidic dacite or rhyolite are considered more likely to contain traces of uranium than more basic andesite or basalt. Heropoulos and Mays (1969) reported semi-quantitative spectrographic analyses of nine Mt. Edgecumbe specimens where uranium was sought but not detected.

DISCUSSION

More than 1,800 lode mining claims have been recorded on Yakobi Island and adjacent parts of Chichagof Island in Tongass National Forest, Southeast Alaska. The Bureau of Mines examined mines, prospects, claims, mineral occurrences, geochemical anomalies, and related geology in this area in 1978 and 1979. From the results of this investigation combined with information from several other sources, it appears that Apex Mountain, Bohemia basin, and Mirror Harbor are areas favorable for the development of Mineral deposits. Other favorable areas include Mt. Baker and the Lisianski Gold Area. The Squid Bay - Lost Cove Area and Deep Bay area also may have potential.

Nickel-copper-cobalt magmatic segregations in norite in Bohemia Basin on Yakobi Island and at Mirror Harbor 15 miles to the south on the west coast of Chichagof Island have potential for development. Measured and inferred reserves of 20.1 million tons of 0.31 percent nickel, 0.18 percent copper, and 0.04 percent cobalt are reported at Bohemia Basin. A smaller undisclosed tonnage of similar grade is reported at Mirror Harbor, plus a separate nearby deposit with 7,300 tons of 1.60 percent nickel and 0.90 percent copper. In both places the full extent of the mineralized zones remains unknown.

Gold-silver-tungsten fissure veins with potential for the development of small scale mining operations occur in diorite and adjacent metamorphic rocks on Apex Mountain west of Lisianski Inlet where the Apex-El Nido mines produced 17,000 ounces gold and 2,400 ounces silver through 1939, the last year of production.

Reserves of 26,600 tons of 0.96 ounce gold per ton were reported in 1941. Similar veins having limited potential for small scale development occur in the surrounding four mile wide and 15 mile long Lisianski Gold area from which some gold production, possibly 1000 ounces, is reported from three other gold properties.

A copper and silver-bearing structural zone in Goon Dip Greenstone having some potential for development is exposed in open cuts at the Mt. Baker Copper Prospect just north of Goulding Harbor. Samples assay 2 and 7 percent copper for respective widths of 13 and 2 feet in widely separated open cuts but development is insufficient to prove continuity or estimate reserves. Ground geophysics and geochemistry indicate that this structure which is mineralized in the open cuts may extend for more than a mile, but may not be as highly mineralized as in the open cuts.

Copper occurs elsewhere in the Goon Dip Greenstone, and also is associated with magnetite skarn in diorite south of Stag Bay and with high grade metamorphic rocks east of Mine Mountain. Although the known copper occurs in geochemical amounts, or in apparently small poorly exposed deposits, some potential exploration targets have been established. Porphyry copper characteristics were not observed. The age, lithology, and stratigraphy of the Goon Dip Greenstone and overlying Whitestripe Marble suggest suggest strong similarities with the Nikolai Greenstone and Chitistone Limestone of the Wrangell Mountains. However, evidence of Kennecott-type copper deposits has not been observed.

Small copper-nickel showings were seen in gabbroic rocks in the

Squid Bay - Lost Cove area on adjacent parts of Yakobi and Chichagof Islands. Gold and uranium are reported in stream sediments associated with a granodioritic stock at Deep Bay near the south end of the study area. Both are exploration targets with unknown potential.

REFERENCES

1. Asbury, D.M. Vevelstad Copper-Iron Property. Alaska Terr. Dept. Mines Mining Rept. 114-10, 1964, 3 pp.

2. Berg, H.C. and E.H. Cobb, Metalliferous Lode Deposits of Alaska. U.S. Geol. Survey Bull. 1246, 1967, 254 pp.

3. Berg, H.C., D.L. Jones and P.L. Coney. Map Showing Pre-Cenozoic Tectonostratigraphic Terranes of Southeastern Alaska and Adjacent Areas. U.S. Geol. Survey OFR 78-1085, 1978, Scale 1:1,000,000, 1 sheet.

4. Berg, H.C., J.E. Decker and Beth S. Abramson. Metallic Mineral Deposits of Southeastern Alaska. U.S. Geol. Survey OFR 81-122, 1981, 142 pp., 1 map (scale 1:1,000,000).

5. Brew, D.A., L.J.P. Muffler and R.A. Loney. Reconnaissance Geology of the Mount Edgecumbe Volcanic Field, Kruzof Island Southeastern Alaska. U.S. Geol. Survey Prof. Paper 650-D, 1969, pp. D1 to D8.

6. Brooks, A.H. The Mining Industry of Alaska in 1920. U.S. Geol. Survey Bull. 722-A, 1922, pp. 37-38.

7. Buddington, A.F. Mineral Investigations in Southeast Alaska. U.S. Geol. Survey Bull. 773-B, 1925, pp. 72, 95-105, 110-125.

8. -----. Alaskan Nickel Minerals. Econ. Geology, v. 19, no. 6, 1924, pp. 521-541.

9. Buddington, A.F. and T. Chapin. Geology and Mineral Deposits of Southeastern Alaska. U.S. Geol. Survey Bull. 800, 1929, 398 pp.

10. Bush, B.O. and R.F. Kenly. Report of Geophysical Investigation, Lucky Devil Mining Claims, Chichagof Island, Alaska. Alaska Div. Geol. and Geophys. Surveys Mining Rept. 114-7, 1962, 10 pp.

11. Chapin, T. Mining Developments in Southeastern Alaska. U.S Geol. Survey Bull. 642-B, 1916, p. 78.

12. Cornwall, H.R. Nickel Deposits of North America. U.S. Geol. Survey Bull. 1223, 1966, pp 13, 36-38.

13. Dahlin, D.C., A.R. Rule and L.L. Brown. Beneficiation of Potential Platinum Resources from Southeastern Alaska. BuMines RI 8553, 1981, 14 pp.

14. Decker, J.E. Geologic Map of Western Chichagof Island, Southeastern Alaska, U.S. Geological Survey OFR 80-150, 1980, Scale 1:63,360, 2 sheets.

15. Decker, J.E., B.R. Johnson. Geologic Relations on Chichagof Island Bearing on the Nature and Position of the Border Ranges Fault, in U.S. Geol. Survey in Alaska, Accomplishments during 1979; ed. by N.R.D. Alber, and Travis Hudson. U.S. Geol. Survey Circular 823-B, 1981, pp. 102-104

16. Decker, P.A. E.B. Sparling's Haywire Group, Chichagof Island, Alaska. Unpublished report, 1931, 5 pp; available at Bureau of Mines library, Juneau, Alaska.

17. Eakins, G.R. Uranium Investigations in Southeastern Alaska. Alaska Div. Geol. and Geophys. Surveys Geol. Rept. 44, 1975.

18. East, J.H., Jr., W.M. Traver, R.S. Sanford and W.S. Wright. Yakobi Island Nickel Deposit, Sitka Mining District, Alaska. BuMines RI 4182, 1948, 28 pp.

19. Fleming, E.E. Alaska Nickel Mines Property, Chichagof. Unpublished report, 1917, 9 pp; available at Bureau of Mines library, Juneau, Alaska.

20. Healy, R.L. Report on the Alaska Nickel Mines, Sitka Mining District, Southeastern Alaska. Unpublished report 1918, 15 pp; available at Bureau of Mines library, Juneau, Alaska.

21. Heropoules, C. and R.E. Mays. Semiquantitative Spectrographic Analyses of Nine Specimens from the Mount Edgecumbe Volcanic Field, Kruzof Island, Southeastern, Alaska. U.S. Geol. Survey OFR 69-126, 1969, 3 pp.

22. Hessin, T., and others. Maps Showing the Distribution and Abundance of Copper, Zinc, Molybdenum, Arsenic, and Uranium in Filtered Water Samples, Western Chichagof-Yakobi Islands Wilderness Study Area, Southeast Alaska. U.S. Geol. Survey Open File Report in preparation. [8 other maps in this series also in preparation].

23. Holmes, G.L. Report on the Apex-El Nido Mine. Unpublished report, 1941, 20 pp; available at Bureau of Mines library, Juneau, Alaska.

24. Jackson, G.T. Alaska Nickel Mines. Unpublished report, 1918, 3 pp.; available at Bureau of Mines library, Juneau, Alaska.

25. Johnson, B.R. and G.S. Elliott. Map Showing the Distribution and Abundance of Silver and Gold in Bedrock Samples, Western Chichagof-Yakobi Islands Wilderness Study Area, Southeast Alaska. U.S. Geol. Survey OFR 81-27C, 1982. In preparation. Scale 1:125,000, 1 sheet.

26. -----. Map Showing the Distribution and Abundance of Copper in Bedrock Samples, Western Chichagof-Yakobi Islands Study Area, Southeastern Alaska. U.S. Geol. Survey OFR 81-27E, 1981.

27. Johnson, B.R. and S.M. Karl. Reconnaissance Geologic Map of Western Chichagof and Yakobi Islands, Southeastern Alaska. U.S. Geol. Survey Miscellaneous Field Investigation, 1982 In preparation. Scale 1:125,000, 2 sheets.

28. Karl, S.M., J.E. Decker and B.R. Johnson. Discrimination of the Chugach and Wrangellia Terranes in the Kelp Bay Group on Chichagof and Baranof Islands, southeastern Alaska: Accomplishments During 1980; ed. by W.M. Coonrad. U.S. Geol. Survey Circ. 844, 1981. In press.

29. Kennedy, G.C., M.S. Walton, Jr. Nickel Investigations in Southeastern Alaska. U.S. Geol. Survey Bull. 947-C, 1946, pp. 39-64.

30. Kennedy, G.C. Summary of Geological Survey Results in Connection with Bureau of Mines Investigation of the Nickel-Copper Deposits of Bohemia Basin, Yakobi Island, Southeastern Alaska. Unpublished report, 1944, 22 pp; available at Bureau of Mines library, Juneau, Alaska.

31. Kerr, P.F. A Magmatic Sulphide Ore from Chichagof Island, Alaska. Econ. Geology, v. 19, no. 4, 1924, pp. 369-376.

32. Kuhn, J.G. Facts Concerning Copper-Nickel-Cobalt Deposits on Yakobi Island. Company release, Apr. 3, 1978, 3 pp.

33. Laney, F.B. Mineralogical Examination of a Suite of Nickel Ores from the Alaska Nickel Mines. Alaska Terr. Dept. Mines Mineral Resource Rept. 114-5, 1942, 7 pp.

34. LKB Resources, Inc. NURE Aerial Gamma-Ray and Magnetic Reconnaissance Survey. Southeastern Area-Alaska. Vols. I, II. Work performed under subcontract to Bendix Field Engineering Corp., Grand Junction, CO for the U.S. Dept. of Energy, 1979, ca. 280 pp., app: microfilm record listings, illus. GJBX-48 '79.

35. Loney, R.A., H.C. Berg, J.S. Pomeroy and D.A. Brew. Reconnaissance Geologic map of Chichagof Island and Northwestern Baranof Island, Alaska. U.S. Geol. Survey Miscellaneous Geologic Investigations Map I-388, 1963, scale 1:250,000. 1 sheet.

36. Loney, R.A., D.A. Brew and L.J.P. Muffler, J.S. Pomeroy. Reconnaissance Geology of Chichagof, Baranof and Kruzof Islands. U.S. Geol. Survey Prof. Paper 792, 1975, 105 pp.

37. Martin, G.C. The Alaskan Mining Industry in 1917. U.S. Geol. Survey Bull. 692, 1919, pp. 22-23.

38. Moerlein, G.A. Geology, Geophysics, and Geochemistry Mt. Baker Copper Prospect, Alaska. Unpublished report, 1971, 6 pp., 4 maps.

39. National Oceanic and Atmosphere Administration. Climatological Data, Annual Summary, Alaska. Various years from 1970 to 1979.

40. Noel, G.A. The Productive Mineral Deposits of Southeastern Alaska. Alaska Div. Mines and Minerals 1966 Annual Rpt., 1967, pp. 51-59.

41. Overbeck, R.M. Geology and Mineral Resources of the West Coast of Chichagof Island. U.S. Geol. Survey Bull. 692-B, 1919, pp. 110-133.

42. Pecora, W.T. Nickel-Copper Deposits on the West Coast of Chichagof Island, Alaska. U.S. Geol. Survey Bull. 936-I, 1942, pp. 221-243.

43. Plafker, G., D.L. Jones, T. Hudson and H.C. Berg. The Border Range Fault System in Alexander Archipelago. Ch. in The United States Geological Survey in Alaska: Accomplishments During 1975, ed. by E.H. Cobb. U.S. Geol. Survey Circular 733, 1976, pp. 14-16.

44. Reed, J.C. Some Mineral Deposits of Glacier Bay and Vicinity, Alaska. Econ. Geology, v. 33, no. 1, Jan-Feb, 1938, pp. 52-80.

45. Reed, J.C. and R.R. Coats. Geology and Ore Deposits of the Chichagof Mining district, Alaska. U.S. Geol. Survey Bull. 929, 1941, 148 pp.

46. Reed, J.C. and J.V.N. Dorr. Nickel Deposits of Bohemia Basin and Vicinity, Yakobi Island, Alaska. U.S. Geol. Survey Bull. 931-F, 1942, pp. 105-138.

47. Ricker, S. Preliminary Report and Project Set-up, Bohemia Basin Nickel, Yakobi Island, Alaska. Unpublished report, 1941, 1 p.; available at Bureau of Mines library, Juneau, Alaska.

48. Roehm, J.C. Preliminary Report of Lucky Strike Prospect, Lisianski Inlet, Chichagof Island, Sitka Mining District. Alaska Terr. Dept. Mines Property Exam. 114-1, 1936, 2 pp.

49. -----. Preliminary Report of Goldwin Group, Lisianski Inlet, Chichagof Island, Sitka Mining District. Alaska Terr. Dept. Mines Property Exam. 114-2, 1936, 2 pp.

50. -----. Summary Report of Mining Investigations in the Sitka and Juneau Mining Districts, Vicinities of Yakobi, Chichagof, Kruzof, Krestof, Halleck and Admiralty Islands. Alaska Terr. Dept. Mines Itinerary Rept., 1938, pp. 1-2.

51. -----. Report of Bohemia Tunnel, Bohemia Basin, Yakobi Island, Alaska. Alaska Terr. Dept. Mines Property Exam. 114-9, 1938, 2 pp.

52. -----. Strategic and Critical Mineral Occurrences in Southeast Alaska. Alaska Terr. Dept. Mines Mineral Resource Rept. 191-5, 1943, pp. 2-3.

53. -----. Alaska Terr. Dept. Mines Itinerary Rept., 1947, pp. 1-9.

54. -----. Alaska Terr. Dept. Mines Itinerary Rept., 1953, pp. 21.

55. Rogers, J.C. Alaska Nickel Mines. Unpublished report, 1917, 7 pp.; available at Bureau of Mines library, Juneau, Alaska.

56. Rossman, D.L. Geology and Ore Deposits of Northwestern Chichagof Island, Alaska. U.S. Geol. Survey Bull. 1058-E, 1959, 216 pp.

57. Saarela, L.H. Report of the Commissioner of Mines for the Biennium Ended December 31, 1950. Alaska Terr. Dept. of Mines, 1951, pp. 11,30.

58. Sanford, R.S. Preliminary Report and Project Set-up, Mirror Harbor Nickel Deposits, Chichagof Island, Territory of Alaska. Unpublished Report, 1942, 8 pp.; available at Bureau of Mines library, Juneau, Alaska.

59. Smith, P.S. Mineral Industry of Alaska in 1924. U.S. Geol. Survey Bull. 783-A, 1926, p. 7.

60. -----. Mineral Industry of Alaska in 1927. U.S. Geol. Survey Bull. 810-A, 1930, p. 12.

61. -----. Mineral Industry of Alaska in 1928. U.S. Geol. Survey Bull. 813-A, 1930, p. 14.

62. -----. Mineral Industry of Alaska in 1929. U.S. Geol. Survey Bull. 824-A, 1932, p. 16.

63. -----. Mineral Industry of Alaska in 1930. U.S. Geol. Survey Bull. 836-A, 1933, p. 14.

64. -----. Mineral Industry of Alaska in 1935. U.S. Geol. Survey Bull. 880-A, 1937, p. 17.

65. -----. Mineral Industry of Alaska in 1936. U.S. Geol. Survey Bull. 897-A, 1938, p. 17.

66. -----. Mineral Industry of Alaska in 1937. U.S. Geol. Survey Bull. 910-A, 1939, p. 19.

67. -----. Mineral Industry of Alaska in 1938. U.S. Geol. Survey Bull. 917-A, 1939, pp. 20, 104.

68. -----. Mineral Industry of Alaska in 1939. U.S. Geol. Survey Bull. 926-A, 1941, p. 19.

69. Stewart, B.D. Review by District. Alaska Terr. Dept. Mines Ann. Rept. for 1921, 1922, pp. 42-46.

70. -----. Review of Lode Mining by District. Alaska Terr. Dept. Mines Ann. Rept. for 1922, 1923, pp. 64-66.

71. -----. Review of Lode Mining by District. Alaska Terr. Dept. Mines Ann. Rept. for 1923, 1924, pp. 57-59.

72. -----. Mineral Resources of Chichagof Island. Alaska Terr. Dept. Mines Mining Rept. 114-3, 1931, 3 pp.

73. -----. Report on Cooperation Between the Territory of Alaska and the United States in Making Mining Investigations and in the Inspection of Mines for the Biennium Ending March 31, 1931. Alaska Terr. Dept. Mines, 1932, pp. 29-30.

74. -----. Mining Investigations and Mine Inspection in Alaska, Biennium Ending March 31, 1933. Alaska Terr. Dept. Mines, 1937, pp. 47-52.

75. -----. Report of the Commissioner of Mines to the governor for the Biennium Ended December 31, 1936. Alaska Terr. Dept. Mines, 1934, pp. 47-52.

76. Stewart, B.D. Report of the Commissioner of Mines to the Governor for the Biennium Ended December 31, 1938. Alaska Terr. Dept. Mines, 1939, p. 38.

77. -----. Report of the Commissioner of Mines for the Biennium ended December 31, 1940. Alaska Terr. Dept. Mines, 1941, p. 46.

78. Still, J.C. and K.R. Weir. Mineral Land Assessment of the West Portion of Western Chichagof Island, Alaska. BuMines OFR 89-81, 1981, 168 pp.

79. Storm, L.W. Report on Slim and Jim Copper Prospect, Point Urey, Chichagof Island. Unpublished Report, 1917, 4 pp.; available at Bureau of Mines library, Juneau, Alaska.

80. Thorne, R.L. Chichagof-Alaskan Mining Corp. Lucky Devil Claims, Chichagof Island, Alaska. BuMines Exam. Rept., unpublished report, 1960, 9 pp.; available at Bureau of Mines library, Juneau, Alaska.

81. Thorne, R.L., N.M. Muir, A.W. Erickson, B.I. Thomas, H.E. Heide, and W.S. Wright. Tungsten Deposits in Alaska. BuMines RI 4174, 1948, pp. 5, 48-51.

82. Thornsberry, V. Inspiration Development Company. Oral communication, August 14, 1980.

83. Traver, W.M. Mirror Harbor Nickel Deposits, Chichagof Island, Alaska. BuMines RI 4168, 1948, 13 pp.

84. Traver, W.M. Appendix to War Minerals Report, Mirror Harbor Nickel Deposits, Chichagof Island, Alaska. Unpublished Report, Co. 1942, 54 pp.; available at Bureau of Mines library, Juneau, Alaska.

85. Twenhofel, W.S., J.C. Reed and G.O. Gates. Some Mineral Investigations in Southeastern Alaska. U.S. Geol. Survey Bull. 963, 1949, pp. 20-24.

86. Twenhofel, W.S. Potential Alaskan Mineral Resources for Proposed Electrochemical and Electrometallurgical Industries in the Upper Lynn Canal Area, Alaska. U.S. Geol. Survey Circ. 252, 1953, pp. 5,7.

87. Twenhofel, W.S. and C.L. Sainsbury. Fault Patterns in Southeastern Alaska. Geol. Soc. America Bull., v. 69, 1958, pp. 1431-1432.

88. U.S. Bureau of Mines. Yakobi Island, Sitka Mining District, Alaska. War Minerals Report 174, 1944, 73 pp.; available at Bureau of Mines library, Juneau, Alaska.

89. -----. Mirror Harbor, Chichagof Island, Alaska, War Mineral Report 333, 1945, 9 pp.; available at Bureau of Mines library, Juneau, Alaska.

90. Walton, M.S., Jr., G.C. Kennedy. Magnetic Exploration of the Nickel-Copper deposits of Bohemia Basin, Southeastern Alaska. Econ. Geology, v. 40, no. 7, 1945, pp. 496-502.

91. Williams, J.A. Areal Property, Sitka Quadrangle, Gold and Tungsten. Alaska Terr. Dept. Mines Property Exam. 114-13, 1955, 5 pp.

92. -----. The Mining Industry. Alaska Div. Mines and Minerals Ann. Rept. for 1959, 1960, p. 31.

93. Winchell H.V. Alaska Nickel Mines, Mirror Harbor. Alaska Terr. Dept. Mines Mineral Resource Rept. 114-2, 1918, 14 pp.

APPENDIX

Active claims recorded with BLM through 1979.

Claim Group	Number	Type	Area
Apex-El Nido and others	13	L	Apex Mtn.
do	2	M	do
do	3	P	do
Rainbow	28	L	do
Bon Tara	1	L	Bon Tara
do	1	M	do
Goldwin	6	L	Goldwin
L & S	24	L	Cobol-Mine Mtn.
Yakobi	265	L	Bohemia Basin
Ilene	111	L	Mirror Harbor
Cable	24	L	Cable

L = lode; M = millsite; P = placer

Claim history from courthouse records for selected prospects through the 1978 assessment year (tabulated below).

Apex-El Nido mines and vicinity

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1919	L	Apex #1-12	1949	J. Cann, W. Johnson S. Davis, H. Shepard, A. Wilson	Approx. 1 1/2 miles E. from Junction Island
1919	L	Rainbow #1-4	1921	J. Cann, G.H. Kimball	Adjoining Apex Camp
1919	L	Apex Fraction	1930	J. Cann, G.H. Kimball	N. shore of Stag Bay approx. 1 mile from its entrance
1919	M	Apex #1 Millsite	1948	J. Cann	520' x 520'

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1919	M	Apex #2 Mill-site	1948	J. Cann	520' x 520' Adjoins #1 on S line
1920	L	El Nido & El Nido #1-11	1949	J. Cann	
1920	L	Apex Fraction #2-4	1930	J. Cann	#2 Adjoins Apex Fraction #1 on its N. end; #3 N of #3, #4 N of #3
1920	L	Columbine #1-11	____	W. Scott	N.W. of Apex Claims
1920	L	El Nido #12-14	1949	J. Cann	
1920	L	Rainbow #6	1921	J.D. Leedy, J.H. Cann	Near Apex Claims
1920	L	Panga #1-3	1922	E.L. Adkins	Near Apex Claims
1920	L	Panga Fraction	1922	E. Young	
1920	L	Uncas #1-5	____	E.W. Smith, J.P. Ibach	Adjoins El Nido Claims
1921	L	Hootz	____	V.A. Paine	Adjoins Apex Fraction #4 W. Side & Apex #7 on S. end
1921	L	El Nido #15-17	1949 1930	J.H. Cann, El Nido Mining Co.	#15 adjoins N end #6 W. side #2, #16 adjoins N end #2, #17 adjoins N end #16
1926	L	Apex El Nido Cabin	____	J.H. Cann	

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1930	L	Haywire #1-2	—	E.B. Sparling	Headwaters of Alaffa Cr., Approx. 1/2 mi. S of Apex-El Nido Mines
1932	L	El Nido #16-19	—	Apex-El Nido Mining Co.	
1950	L	Peninsula pl-8	—	S.H.P Vevelstad	N.E. Approx. 1500 ft. S.E. from the S.E. shore of Squid Bay
1951	L	Nancy	—	L.J. Anderson	N.E. Approx. 30 ft W. of the portal of a tunnel at an elevation of 1242 ft. Vein Approx. 10 in. wide running N.E.
1951	L	Sally	—	L.J. Anderson	Headwater of Cann Cr. elevation 1300 ft Approx. 100 ft E. of an open cut on a 2 ft wide quartz vein striking N.E.
1954	L	Gold Spray	1956	C.A. Hodson	In Lisianski Strain 1 1/2 mile from beach S.W. from Pelican
	L	Silver Spray	1956	Mrs. C.W. Wharton	On Chichagof Island-Amended "old Apex claim" 6/13/55
1954	P	#1 below Discovery (Gem Placer)	1954	Ira Lingard, Ray Clements	Approx. 1500 ft S.E. from "old Apex Mine tunnel"
1954	L	Golden Queen	1956	C.A. Hodson, Mrs. C.W. Wharton	Conflicts with #1 below placer Amended 6/13/55
1954	L	#1 Above	—	C.A. Hodson, Mrs. C.W. Wharton	Adjoins Gold Spray on S.E. end; Amended 6/13/55
1955	L	Cable	—	J. Ott, C.A. Hodson	Elevation 1300 ft on Cann Creek
1955	L	Ariel	—	J. Ott	Cann Cr. at the 1300 ft elevation up a draw 600 ft from Cann Cr.

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1955	M	Ariel #1-2 Millsite	——	J. Ott	W. side of Cann Cr., Approx. 1 1/4 mi. from the mouth of Cann Cr. #2 700 ft from the mouth of Cann Cr.
1956	M	Lucky Mine Millsite	——	C.A. Hodson	Approx. 700 ft W. of the mouth of Cann Creek
1958	M	Apex-El Nido Millsite #1-2	1961	J. Ott, C.A. Hodson	Approx. 700 ft W. of mouth of Cann Cr.; #2 approx. 400 ft W. of mouth of Cann Cr. approx 1 1/2 mi from the mouth
1958	P	Apex-El Nido Placer Claim#1	——	J. Ott, C.A. Hodson	Below lode claims elev. 900 ft in Cann Cr. Valley
1958	L	El Nido #1	1971	J. Ott, C.A. Hodson	
1968	L	Apex #1-2 Apex #1-4	1978	P. Barrett, H. Barrett, D. McDonald, M. Michelich	Headwaters of Cann Cr. approx 1.3 mi S.W. of △ "Dust"
1968	P	Barrett #1-3	1978	P. Barrett, D. McDonald, M. Michelich	Lower Cann Creek
1968	L	El Nido #1-7	1978	P. Barrett, H. Barrett, D. McDonald, M. Michelich	Headwaters of Cann Creek
1968	L	Golden Pelican #1-2	——	J. Ott, D. McDonald P. Barrett, M. Michelich	Headwaters of Cann Cr. W. side approx. 1 1/2 mi S.W. of △ "Dust"
1968	M	Golden Pelican Millsite #1-2	——	J. Ott, D. McDonald P. Barrett, M. Michelich	Lower Cann Cr.
1974	L	Rainbow Group Rainbow #22-27 42-47, 62-67, 82-87, 102-107	——	D. McDonald	Cann Cr. & Apex Mtn.

Bon Tara Prospect

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1907	L	Yakobi Gold Mine	—	John R. Dawson	On Yakobi Is., approx. 10 mi "inside of" Lisianski Strait Discovery shaft located at high water mark on beach.
1917	L	Miner Island	—	J.H. Cann, A.B. Dodd, E. Sholan, C. Spurgeon	Disc. post 10 ft from portal of old adit on S.E. corner of Yakobi Is. in a little bay opposite Miner Island
1917	L	El Nido	—	J.H. Cann, A.B. Dodd, E. Sholan, C. Spurgeon	Disc. post 20 ft E. from old cabins on Yakobi Is. across from Miner Is. cabin
1917	L	Yakobi	—	J.H. Cann, A.B. Dodd, E. Sholan, C. Spurgeon	Disc. post of W. end center of Miner Is. claim
1917	L	Nautilis	—	J.H. Cann, A.B. Dodd, E. Sholan, C. Spurgeon	—
1920	L	Miner Is. #2	—	T.W. Shaffer	Relocation of Miner Is. claim
1921	L	Gold Nugget	—	C.A. Hodson	S. shore of Lisianski Inlet approx 2000 ft N.W. of Miner Island
—	L	Relocated Miner Is. #2	—	—	—
1922	L	Miner Is.	—	S.A. Sholin	Disc. at portal of tunnel on Yakobi Is. opposite of Miner Is.
1924	L	Miner Is.	—	Arnold Curtis	Yakobi Is. opposite Miner Is.

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1927	L	Superior #1-6	____	Glen T. Noe	S. shore Lisianski Inlet across from Miner Is.
1929	L	Gold Bug	1934	Thomas Wilson	Yakobi Is. approx. 450 ft from Miner Is.
1929	L	Mars & Mars Ext.	____	Thomas Wilson	Yakobi Is. approx 1/2 mi S. of Miner Is.
1931	L	Amocat & A #2	1949	N.H. Marks	Lisianski Inlet near Miner Is. #2 N. of Amocat
1934	L	Junction, Junction #1	____	American Gold Mining Co., John Laughlin	Corner #1 of Claim #1 N21° 22 1/2 E 7064.5 ft to USLM #7
1936	L	Flamspar ?	____	S.H.P. Vevelstad	On top of the mtn. ridge W. of Miner Is. approx. 1 mi. from tidewater
1944	L	Fluorite & Fluorite #1	____	S.H.P. Vevelstad	N. side of Yakobi Is., approx. 1 mi. from Lisianski Inlet, elev. approx. 1500 ft
1962	L	Alfa Quartz	____	H.S. Christensen, Alpha K. Christensen	20 ft. from tidewater on Yakobi Is on the W. side of Lisianski Strait 200 yds at 270° from Miner Is. 700 yds at 310° from Rock Pt. Light
1973	L	Bon Tara #1	1978	Joe Ott & Loren Loggie	600 ft of Miner Is. on Yakobi Is.
1973	M	Bon Tara Millsite	1978	Joe Ott & Loren Loggie	
1973	L/M	Bon Tara	1978	Joe Ott & Loren Loggie	Reported first staked in 1887

Goldwin Prospect and Vicinity

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1920	L	Paramount #1-10	1921	W. Borland, D. House, F. Shotter, W. Dodge	℄ @ N. Paramount disc.approx. 3000 ft S. of Lisianski Inlet near junction
1920	L	Paramount #11-16	1921	W. Borland, D. House, F. Shotter, W. Dodge	℄ @ N. drainage of valley called "Barland Creek"
1920	L	Diamond #1-2	____	E. Adkins	℄ @ N.; Along side of & parallel to creek which empties into Lisianski Inlet approx. 1/2 mi. S. of Junction Is. which bears N. 40 E (mag) from discovery #25 of #2
1923	L	Universal #1, #6	____	A. Nilsen	℄ @ W.; S. shore Lisianski Inlet near Junction Is.
1923	L	Universal #2-5	____	A. Nilsen	℄ @ W.; S. shore Lisianski Inlet near Junction Is.
1924	L	Goldwin #1-9	1947	W. Borland, F. Shotter, W. Dodge	S. shore Lisianski Inlet S.E. of Miner Is.
1926	L	Junction #1-9	____	G. Shotter	S. shore Lisianski Inlet S.E. of Miner Is.
1927	L	Mountain Top	____	J. Ludden	S. shore Lisianski Inlet near Junction Is.
1929	L	Somehow #1-5	____	N. Mork	S. shore Lisianski Inlet near Junction Is.
1930	L	Reliance #1-3	1949	F. Shotter	S. shore Lisianski Inlet across from Junction Is.

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1935	L	Reliance II	1949	F. Shotter	N. of Reliance
1935	L	Supreme #1-3	1949	Ed Shotter	Shore of Lisianski Inlet near Junction Is.
1936	L	High Grade #1-4, 5-9	1949	F. Shotter, N. Mork J. Ronning	S. shore of Lisianski Inlet
1950	L	Golden #1-4	1959	F. Shotter, N. Mork J. Ronning	Lisianski Inlet near Junction Is.
1972	L	Goldwin #1-6	1978	D. McDonald, S Beadle, R. Roundtree	Lisianski Inlet across from Pelican approx. 1/2 mi E. of navigation marker

Koby Prospect

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1933	L	Lucky Strike #1-9	______	Mrs. Inez Koby, Geo. Skuse	Approx. 2 mi S.E. of W. (end) of Lisianski Inlet
1946	L	Lucky Strike #2,5	______	Jack Koby	Approx. 2 mi S.E. of W. (end) of Lisianski Inlet
1974	L	Late #1-4	1975	El Paso Natural Gas	Approx 2 mi S.E. of W. (end) of Lisianski Inlet

Cobol-Mine Mtn.

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1920	L	Cliff, Beth, Golden Creek	———	Nels Anderson, Jacob Mayer	Approx. 9500 ft W. of shore of Lisianski Inlet, left hand side going up the Inlet approx. 15 mi. from Lisianski Inlet
1921	L	Southside #1-3	1922	Frank & Edmond Cox, Ole Loberg, Geo. Bolyan	Approx. 3 mi. from Pinta Bay on the ridge between the E. fork of the river which empties into Pinta Bay
1921	L	Northside #1-2	1922	Frank & Edmond Cox, Ole Loberg, Geo. Bolyan	On E. side of the head of the N. fork of the river which empties into Pinta Bay approx. 4 mi. from Pinta Bay #2 adjoins S.E. end of #1
1922	L	Mineral Hill #1-2	———	Frank & Edmond Cox, Ole Loberg, Geo. Bolyan	Approx. 3 mi. from Pinta Bay on the N. side of the N. fork of the river entering Pinta Bay
1922	L	Southside #4	———	Frank & Edmond Cox, Ole Loberg, Geo. Bolyan	#4 side of #1
1924	L	Kansas, Buffa-lo, Iowa, Michigan, Wisconsin	———	Arnold Curtis	Approx 4 1/2 mi N. of Pinta Bay
1930	L	Sunset #1-2	———	John Covich	Relocation of Southside group; approx. 5 mi N. of Pinta Bay; formerly controlled by West Coast Dev. Co.
1933	L	Clyde #1-5	———	Frank Cox	Approx. 5 mi. N. of Goulding Harbor on the southside Mineral Hill

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1935	L	Goldenglow	___	Helen Bolyan	Approx. 3 mi from the head of Goulding Harbor on the southside Mineral Hill
1940	L	Goulding Valley #1 Tramway Terminus Location	L ___	Wm. H. Hills, W.H. Rowe, James J. Hills	At the head of Goulding Valley near Stag Bay divide on the West side of Mineral Hill, approx. 5 mi from the beach at Goulding Harbor
1963	L	L & S Mining Claim #1-2, 3A	1974	Merle Loudon, M.L. Sanstrom	Restake of Pinta Bay Mining Co. Claims, Mineral Hill #1-2
1972	L	L & S Mines, Inc. Claim #4-22, #23-24	1974	M.L. Sanstrom, Merle Loudon	___
1974	L	L & S Mines #23-24	___	M.L. Sanstrom, G.H. Sanstrom	Approx Lat. 57° 50' 30" Long. 136 12' & diverges W. from the stream running S.W. on S. slope of Mine Mtn.

Stag Bay (Gold Prospects)

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1919	L	Stag Bay #1-7	___	Al Wilson, J.R. Cann	Approx 1 mi from the beach on the S. shore of Stag Bay
1919	L	Apex Fraction #1	1930	J.R. Cann, C.H. Kimball	North shore of Stag Bay, approx. 1 mi from its entrance
1920	L	Etna	___	J.R. Cann	South shore Stag Bay opposite the cannery buildings

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1920	L	Hoonah #1-2	____	Elmer W. Smith, J.P. Iback	In Stag Bay, "in a southernly direction from Cann Cannery...... on the opposite ridge, the view running NE & SW" #2 S. of #1
1939	L	Rosarito #1-3	____	Mrs. Jennie R. Cann, Joe Repik	North shore Stag Bay 25 ft above high tide
1949	L	Armenta	____	Jack Koby	Stag Bay, approx. 2 1/2 mi from the entrance & approx. 2 mi from the head

Stranger River

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1970	P	Children's Garden #1	1974	James A. Guilmet, Jr. & Marilyn L. Otts (D.B. Templeton, last/or current owner)	On Stranger River at the head of Ilin Bay, approx. 4 mi N.E. of Star Rock

Bohemia Basin & Vicinity

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1920	L	Bohemia #1-5	____	S.H.P. Vevelstad	Approx. 3 mi from tidewater on Jacoby Is., S. of Miner Is.
1920	L	Western	____	S.H.P. Vevelstad	Approx. 1 1/2 mi N.W. of Bohemia Claim on the Western rim of mtn.

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1920	L	Bluff	_____	S.H.P. Vevelstad	W. side of Bohemia Basin approx. 1 1/2 mi from tidewater
1920	L	Dolly	_____	S.H.P. Vevelstad	N.E. side of Bohemia lode claim
1920	L	Metro #1-2	_____	S.H.P. Vevelstad	Eastern rim of Bohemia Basin; #2 N. of #1
1920	L	Eastern Rim #1-5	_____	S.H.P. Vevelstad	Eastern rim of Bohemia Basin approx. 1 mi N.E. of Bohemia #1 & approx. 2 mi from tidewater
1920	L	Bohemia #6,8	_____	S.H.P. Vevelstad	
1921	L	Western Rim #2	_____	S.H.P. Vevelstad	Bohemia Basin
1921	L	Ethel #1-2	_____	S.H.P. Vevelstad, P. Layton, W.J. Wesserling	Approx. 1 mi E. of Mite Cove & approx. 1 1/2 mi from tidewater
1921	L	Bohemia #7, 10-11	_____	S.H.P. Vevelstad	[Bohemia Basin]
1921	L	Eureka	_____	S.H.P. Vevelstad, P. Layton, W.J. Wesserling	Approx. 2 mi W. of Miner Is. on Yakobi Is.
1921	L	Dolly #2	_____	S.H.P. Vevelstad	Adjoins N. side of Dolly #1
1921	L	Bohemia #12-15	_____	S.H.P. Vevelstad	[Bohemia Basin]

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1922	L	Tasmania #1-5, 9-14	———	S.H.P. Vevelstad	West side of Bohemia Basin
1922	L	Bohemia #2	———	S.H.P. Vevelstad	Bohemia Basin amended location for #1 3-16
1923	L	Ethel	———	S.H.P. Vevelstad	Located on W. end of Eureka & adjoins Ethel #2
1924	L	Tasmania #1-12	———	S.H.P. Vevelstad	W. side of Bohemia Basin
1924	L	Bohemia 7-15	1929	Alma Wilson	
1926	L	Etolin #1-12	1929	S.H.P. Vevelstad	N. end of Bohemia Basin
1926	L	Harbor	1929	S.H.P. Vevelstad	Mouth of Bohemia Basin
1928	L	Harbor #1-4	———	G. Comstock	E. side of Yakobi Is. on Lisianski Strait approx. 1 1/2 mi S. of Miner Is.
1928	L	Basin #1-5	———	G. Comstock	Bohemia Creek Basin
1928	L	Mayfair #1-2	———	G. Comstock	N.E. side of Yakobi Is. approx. 1 mi from Lisianski Strait, approx. 2 1/2 mi S. of Miner Is.
1928	L	Last Chance #1-2	———	G. Comstock	N.E. side of Yakobi Is. approx. 1 mi from Lisianski Strait approx. 2 1/2 mi S.W. of Miner Is.

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1929	L	Mars, Mars Ext.	—	T. Wilson	Approx. 1 mi S. of Miner Is. on Yakobi Is., Ext. W. of Mars
1929	L	Tip Top	—	T. Wilson	Yakobi Is. approx. 1/2 mi S. of Miner Is.
1929	L	Tasmania #1-15	—	C. Vevelstad	Ridge W. of Bohemia Basin approx. 4 mi from tidewater
1929	L	Tasmania #16-23	—	C. Vevelstad	
1929	L	Harbor, Harbor #5-7	1929	C. Vevelstad	Bohemia Basin & Bohemia Creek
1929	L	Bohemia #16-18	1933	C. Vevelstad	Bohemia Basin
1930	L	Miner's Hope #1-2	1933	C. Vevelstad	Approx. 2 1/2 mi from tidewater at Lisianski Strait S.W. Miner Is.
1930	L	Bohemia #20-23	1933	C. Vevelstad	Head of Bohemia Basin approx. 3 mi from tidewaters
1930	L	Golden Chance #1-2	1933	C. Vevelstad	Approx. 1 1/2 mi W. of Miner Is.
1931	L	Bohemia #24-27	1933	S.H.P. Vevelstad	
1931	L	Mayflower #1-27	1934	Alma Nilsen	#1 on top of the mtn. N.W. of Bohemia Basin, approx. 4 mi
1931	L	Mayflower A	1934	Alma Nilsen	Mayflower A: on top of mtn. N.W. of Bohemia Basin running down the other side, approx. 4 1/2 mi from tidewater Lisianski Strait

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1934	L	Bohemia #16-17	____	Alma Nilsen	#17 adjoins N.W. Side of Bohemia #1 S.E. end Bohemia #16
1934	L	Yakobi Nickel #1-9	1936	Alma Nilsen	Bohemia Basin approx. 3 mi S.W. of Miner Is.
1934	L	Mayflower #7-21	1948	C. Vevelstad	
1935	L	Yakobi Nickel #1A-15A	1950	C. Vevelstad	Bohemia Basin
1935	L	Yakobi Nickel #16A	1936	C. Vevelstad	Bohemia Basin
____	_	Mountain Top	____	Mrs. Bertha Osborne	?
1936	L	Portia Nickel #1-28	1949	S.H.P. Vevelstad	Tasmania Mtn. approx. 3 1/2 mi S.W. of Miner Is. N.W. side of Bohemia Basin
1938	L	Mayflower #7-44	1949	Carl Vevelstad	Yakobi Is.
1938	L	Canyon Nickel #1-18	1949	Carl Vevelstad	Bohemia Basin
1939	L	Betty #1-3	1949	Carl Vevelstad	Bohemia Basin
1940	L	Apollo #1-17	____	M.S. Larson	Head of Bohemia Basin
1940	L	Minerva Nickel #1-26	____	M.S. Larson	N.W. side of the head of Bohemia Basin approx. 3 3/4 mi S.W. Miner Is. & approx. 2 1/4 mi S.W. from the mouth of Bohemia Creek

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1940	L	Betty Nickel #5-8	1948	Carl Vevelstad	Bohemia Basin approx. 3 1/2 mi S.W. from mouth of Bohemia Creek
1940	L	Vevelstad Nickel #1-12	1948	Carl Vevelstad	On ridge on N.W. side of head of Bohemia Basin approx. 3 1/2 mi S.S.W. from Miner Is. approx. 2 mi S.W. of Mouth of Bohemia Creek
1940	L	Mayflower #34	———	Carl Vevelstad	Approx. 1/2 mi from the mouth of Bohemia Cr. approx. 2 1/2 mi S. of Miner Is.
1944	L	Frank, Marie	———	Gladys M. Allen	Yakobi Is. approx. 3 mi S.E. of Mt. Brigham
1950	L	Shoreline	———	Wm. Pope	W. side of Yakobi Is., S. side of Bohemia Creek
1950	L	Hope #1-2	1955	Wm. Pope	Bohemia Basin
1950	L	Rita #1-4	1955	Wm. Pope	3000 ft W. of tunnel in Bohemia Basin
1952	L	Takanis #1	1955	Aurora Nickel Co., W.L. Pope	5.7 mi S. of Rock Pt. Lt. & 4 mi N.E. from inside of entrance to Stag Bay
1952	L	Svere #2 & 3	1955	Aurora Nickel Co., W.L. Pope	#2: 4.7 mi S. of Mirror Lake, 2 mi W. of mouth of Bohemia Creek
1952	L	Beach #1-3	1955	Aurora Nickel Co., W.L. Pope	?
1952	L	Doris #1-4	1955	Aurora Nickel Co., W.L. Pope	4.4 mi S. of Rock Pt. Lt. 2.8 mi S.W. of N. side of Stag Bay

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1952	L	Yakobi #1-12	____	E.M. Flynn	Bohemia Basin
1952	L	Betty #1-8	____	E.M. Flynn	Bohemia Basin
1952	L	Portia #1-11	____	E.M. Flynn	Bohemia Basin
1952	L	Mayflower #2-9	____	E.M. Flynn	Bohemia Basin
1952	L	Takanis #1-23	____	E.M. Flynn	Bohemia Basin
1952	L	Juneau #1-10	____	E.M. Flynn	Bohemia Basin
1952	L	Pelican #1-30	____	E.M. Flynn	Bohemia Basin
1954	L	Mars Nickel #1-2	1954	S.H.P. Vevelstad	Bohemia Basin
1954	L	Hope #1-18	1954	S.H.P. Vevelstad	Bohemia Basin
1954	L	Rita Nickel #1-6	1954	S.H.P. Vevelstad	Bohemia Basin
1954	L	Beach #1-3	1954	S.H.P. Vevelstad	Bohemia Basin
1954	L	Mystery Nickel #1-2	1954	S.H.P. Vevelstad	Bohemia Basin: #1 S. of #2; #1 400 ft E. from N. end of Takanis Lake 3 mi @ S56 W. from mouth of Bohemia Cr.; #2: 1000 ft E. from N. end Takanis Lake

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1955	L	Karen Nickel #1-16	1956	Carl Vevelstad	Bohemia Basin
1955	L	Aleutian Nickel #1-23	1958	Carl Vevelstad	Bohemia Basin
1955	L	Pelican #23	1958	E.R. Harrigan	Bohemia Basin
1955	L	Aleutian Nickel #24-40	1958	Carl Vevelstad	Bohemia Basin
1955	L	Michiele Nickel #1-2	1956	Carl Vevelstad	Bohemia Basin; #2: 1000 ft N.E. from N. end of Takanis Lake, 5100 yds @ 237° from mouth of Bohemia Cr.: #2 W. of #1
1955	L	Karen Nickel #17-20	1956	Carl Vevelstad	Bohemia Basin
1955	L	Takanis #1-23	____	E.R. Harrington	Bohemia Basin
1955	L	Norma #1-13	1958	E.R. Harrington	
1955	L	Aleutian Nickel #41-46	1958	Carl Vevelstad	Bohemia Basin
1955	L	Karen Nickel #21-28	1956	Carl Vevelstad	Bohemia Basin
1955	L	Juneau #9-16	____	E.R. Harrington	Bohemia Basin
1955	L	Mayflower #1, 10-18	____	E.R. Harrington	Bohemia Basin

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1955	L	Norma #14-16	1958	E.R. Harrington	Bohemia Basin
1955	L	Takanis #24-45	______	E.R. Harrington	Bohemia Basin
1955	L	Pelican #1-23	______	E.R. Harrington	Bohemia Basin
1955	L	Aleutian Nickel #47-50	1958	Carl Vevelstad	Bohemia Basin
1956	L	Juneau #5-8	______	E.R. Harrington	Bohemia Basin
1956	L	Norma #18-27	1958	E.R. Harrington	Bohemia Basin
1956	L	Karen Nickel #51-74	1956	Carl Vevelstad	Bohemia Basin
1956	L	Michele #3-8	1956	Carl Vevelstad	Bohemia Basin
1956	L	Aleutian Nickel #51-74	1956	Carl Vevelstad	Bohemia Basin
1957	L	Cliff #1-4, 6-8	______	Ray Westfall	Bohemia Basin
1957	L	Gwinn #1-2	______	Ray Westfall	Bohemia Basin
1957	L	Linda #1-4	______	Ray Westfall	Bohemia Basin

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1972-73	L	Yakobi (286 cls)	1978 (most)	Inspiration Development Company	Bohemia Basin vicinity

Mirror Harbor and Vicinity

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1911	L	Sea Level	—	O. Kittilsby	1 mi E. of Hoonah Hot Springs
1915	L	Sea Level #1-4	—	E.E. Fleming, S. Vevelstad	
1916	L	Elenore Fraction	—	W.S. Flemming	Lies between the S.E. end line of Sea Level #38 the N.W. end line of Sea Level #4
1916	L	Sea Level #5-7	—	W.S. Flemming	#5 adjoins S.E. end #4; #6 adjoins N.W. end of #2; #7 adjoins N.W. end of #1
1916	M	Falls Creek Millsite	—	E.E. Fleming	E. bank Falls Creek for Juneau Sea Level Mining Co.
1916	L	Sea Level #1-7	1921	E.E. Fleming	Amended Locations
		Eleanor	1918		
1916	L	Sea Level #8-10	1921	E.E. Fleming	
1916	L	Sea Level #11-18	1921	Juneau Sea Level Copper Mines	

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1916	L	Annie Fraction	1918	Juneau Sea Level Copper Mines	
1916	L	Little Bay #1-4	———	J. Erman & others	Approx. 3 mi E. of Hoonah Hot Springs and approx. 2 mi W. from Icy Pass
1918	L	Hootz Bay	1921	S.H.P. Vevelstad	Head of Small Bay also known as Little Bay. Approx. 1 1/2 mi S.E. of Juneau & Cu Mine & approx. 4 mi from Pinta Bay
1923	L	Sea Level #4	———	S.H.P. Vevelstad	Relocation
1924	L	Sea Level #2, 5-11	———	S.H.P. Vevelstad	
1925	L	Sea Level #9-13	———	Alma Nilsén	
1925	L	Pioneer #1-3	———	C.R. Reid	Restake of Sea Level claims
1926	L	Sunrise #1-2	———	Geo. Comstock	Mirror Harbor approx. 1 1/2 mi S.E. of White Sulphur Springs
1928	L	Sunrise #3	———	Geo. Comstock	N.W. side of Chichagof Is. at tidewater, approx. 3000 ft W. from entrance of Mirror Harbor on W. side of Channel
1929	L	Aurora #1-2	1936	Carl Vevelstad	N.E. side Flemming Is. at Mirror Harbor
1929	L	Aurora #3	1936	Carl Vevelstad	E. side of Davison Bay close to tidewater approx. 2 mi S.E. from White Sulphur Springs

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1931	L	Sulphur Springs #1-2	1933	Carl Vevelstad	Approx. 1 mi S.E. of White Sulphur Springs at tidewater
1931	L	Aurora #2-10	1933	Alma Nilsen	#2: S.E. side Flemming El.; #3 E. side Davison Bay across from Flemming Is.
1934	L	Pacific	____	Alma Nilsen	Approx. 1 mi S.E. of White Sulphur Springs at tidewater
1934	L	Aurora #1-10	1948	Alma Nilsen	Mirror Harbor
1935	L	Aurora Nickel #2-6	1949	Carl Vevelstad	Mirror Harbor
1935	L	Mirror Harbor	____	Carl Vevelstad	Mirror Harbor
1936	L	Aurora Nickel #11-20	1949	S.H.P. Vevelstad	Mirror Harbor
		Aurora #14A-22A			
1940	L	Chichagof Nickel #1-10	____	Magnus S. Larson	#1 N.W. side of the Entrance to Mirror Harbor & approx. 1 1/2 mi S.E. of White Sulphur Springs
1940	L	Alaska Nickel #1-17	1950	Carl Vevelstad	#1 approx. 600 ft from tidewater on S.E. side of Davison Bay, approx. 1/2 mi S.E. from Flemming Is., approx. 1500 ft N.W. from entrance to Little Bay
1941	L	Alaska #18-47	1948	Carl Vevelstad	N.W. side of Little Bay at tidewater, #18 approx. 1 1/2 mi S.E. of Mirror Harbor

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1950	L	Mirror Harbor & M.H. #1-5	——	S.H.P. Vevelstad	Mirror Harbor
1954	L	Mirror Harbor & M.H. #1-8	1956	S.H.P. Vevelstad	Mirror Harbor
1958	L	Mirror Harbor #9-29	1970	Carl Vevelstad	Mirror Harbor
1972	L	Ilene Group (111 cls) 108, 110, 207-213, 307-313, 406-413, 507-512, 601-611, 701-710, 801-806	1978	Inspiration Development Co. (Dave Johnson)	Davison Bay
1975	L	Chi #1-10, 15-18	1976	El Paso Mining & Milling Co. (Roger A. George)	Near Little Bay S.W. of Mt. Douglas T47S, R56E, Sec. 23
1976	L	Ilene 314-316, 414-418, 513-518, 612-618, 711-718, 807-818, 906-918	——	Inspiration Development Co. (Dave Johnson)	Davison Bay

Lost Cove - Squid Bay Area

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1918	L	Seal Lake #6-8	1921	S.H.P. Vevelstad	S.E. side of bay known as Bettina Bay

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1929	L	Squid Bay		Carl Vevelstad	Approx. 3 mi N.W. of Pt. Theodore, Squid Bay
1931	L	Squid Bay Nickel	1933	Alma Nilsen	Right side of entrance to Squid Bay at shoreline
1934	L	Squid Bay	——	Carl Vevelstad	At tidewater at the right side of the entrance to Squid Bay approx. 2 1/2 mi N.W. of Pt. Theodore
1936	L	Juliet Nickel	——	S.H.P. Vevelstad	Squid Bay at right side of entrance at tidewater, approx. 2 mi N.W. from Pt. Theodore
——	L	Polaris	1949	Carl Vevelstad	Squid Bay, S. side of entrance to the Bay
1941	L	Lost Nickel #1-6	——	Carl Vevelstad	S.E. side of "Lost Cove" at tide-water, Lisianski Strait, 1 1/2 mi N. of Esther Is.
1941	L	Lost Hope #1	——	Carl Vevelstad	S.E. side of the entrance to Squid Bay approx. 2 mi N.W. of Pt. Theo-dore
1950	L	Peninsula & P#1-8	——	S.H.P. Vevelstad	Approx. 1500 ft S.E. from the S.E. shore of Squid Bay, approx. 2 1/2 mi N. of Pt. Theodore (#1-3)
1955	L	Mindalena Is. #1-3	1951	Carl Vevelstad	S.E. side Squid Bay at entrance
1957	L	Greentop Nickel #1-3	——	Carl Vevelstad & Bernhoff Dahl	S.E. side of the entrance to Squid Bay
1958	L	Greentop #1-7	——	S.H.P. Vevelstad	Greentop Harbor

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1958	L	Flamingo #1-3	1959	S.H.P. Vevelstad	Squid Bay
1961	L	Joanne Nickel #1-8	—	Carl Vevelstad	Greentop Harbor & Squid Bay

Mt. Baker Prospect

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1907	L	Calif., N. Star, Sitka	—	Fred Johnson, Chas. Peterson	N. side of entrance to Portlock Harbor (Now called Goulding Harbor)
1907	L	Anklin, Shax-lin, Ankow	1917	Cyrus Orr	Approx. 2 mi N.W. of Pinta Bay
1910	L	Millie & others (8 cls)	—	B. Metz, Tom Baker	Approx. 3 mi N. of Cape Edward on W. side of unnamed Bay, elev. approx. 100 ft.
1910	L	Aklin	1915	P.O. Rathsock, Portlank Harbor Mining Co.	On the West side of a high mountain whose summit is approx. 2 mi N.W. of Pinta Bay approx. 1200 W. of summit tunnel located on West end of claim, now driven approx. 30 ft.
1914	L	Teddy	—	Chas. Turney	W. side of Pinta Bay (now Goulding Harbor)
1915	L	Sunnyside #1-2	—	S.H.P. Vevelstad	W. side of Pinta Bay (now Goulding Harbor)

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1915	L	Bear, Yellow Jacket	—	W.R. Hanlon	Approx. 3 mi N. of Pinta Bay approx. 20 mi W. of Klag Bay; re-location of Portlock Harbor claim.
1915	L	Harriet, Stag	—	B.L. Duke	Approx. 3 mi N. Pinta Bay approx. 20 mi W. of Klag Bay; relocation of Portlock Harbor claim
1916	L	Little Bay #1-2	—	J. Erman & others	Approx. 3 mi E. of Hoonah Hot Springs, approx. 2 mi W. of Icy Pass
1916	L	Snowside #1-2	—	Baker, Tobey, Bolyan	Approx. 1200 ft from Pinta Bay (now Goulding Harbor)
1916	L	Goldern Copper #1-6	1921	L.W. Baker, Geo. Bolyan, James Tobey	Approx. 20 mi N.W. of Chichagof P.O., approx. 3 mi N.W. from Port-lock Harbor (also known as Pinta Bay)
1921	L	Eagle	—	Geo. Bolyan	Approx. 18 mi N. of Chichagof P.O. send running along the beach line of the Goldern Harbor
1921	L	Hank #1	—	Geo. Bolyan	2000 ft from shoreline of Goldern Harbor, S. side Davis Mt.
1921	L	Red Top #1-2	—	Geo. Bolyan	#1 adjoins S.E. end of Goldern Copper #3, #2 adjoins Goldern Copper #4
1921	L	Red Top #3-4	—	Geo. Bolyan	#3 N.W. of #2, #4 N.W. of #3
1928	L	Mother Lode (3 cls)	—	Ed Cox	(claim map in A.J. report)

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1928	L	Brown Bear	____	C.A. Hodson	Adjoins above claim
1946	L	Commando, Asurite Chief	1950	I.M. Hofstad & Arthur Hofstad	S. side of Mt. Baker
1947	L	Emerald Crysacola	1950	J.M. Hofstad	W. side of Mt. Baker
1947	L	Mt. Baker Copper	____	Arthur Hofstad	S. side of Mt. Baker
1951	L	Defense #1-2	1953	Frank Cox, Geo. Bolyan	N.W. side of Baker Peak, approx. 1 1/2 mi from the head of Goulding Harbor
1952	L	Defense #3-4	____	Helen Bolyan	Baker Peak, 3W. of #1-2, #4 S. of #2
1955	L	Baker Peak #1-3	____	Rudolph Sarvela	N.W. side of Baker Peak; N.W. end #3 adjoins S.E. end #2
1957	L	Baker Peak #1-2	____	Myrth Sarvela	N.W. side of Baker Peak, approx. 1 1/2 mi
1961	L	Baker Peak #1-3	1978	John T. Brockway	W. for #1, N.W. for #2 & 3
1961	L	Defense	____	John T. Brockway	________
1961, 62	L	Humble	1978	John T. Brockway	Near top of Baker Peak to S.W. slope
1961, 62	L	Humble #1,2	____	John T. Brockway	Parallel to W. side of W. #2

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1961	L	Lucky Devil #1-12	1978	John T. Brockway	Baker Peak
1961	L	Millie & Millie #1	—	John T. Brockway	W. side of Baker Peak #1 end line of Millie adjoins sideline of Baker Peak #1, E. sideline Millie adjoins W. sideline of Humble. E. sideline of M #1 adjoins W. side line of Humble #1
1962	L	Defense #1-2	—	John T. Brockway	—
1962	L	Lucky Devil #13	—	John T. Brockway	—
1962	L	Mag #1-10	1978	John T. Brockway	—
1962	L	Best #1-6	1978	John T. Brockway	—
1963	L	Goulding #1	—	John T. Brockway	Approx. 1056 ft N.E. from inner-most pt. of Baker Cove. Approx. 1.2 mi from N. end of island of entrance to Goulding Harbor
1963	L	Contact & Contact #1-4	—	John T. Brockway	—
1968	L	Contact #5	—	John T. Brockway	—
1970	L	Roman Cl. IV-VI	—	Virgil Wright	(See claim map)

Copper in Greenstone

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1974	L	Falls #1-36	1975	El Paso Natural Gas	1 1/2 mi N.E. of the head of Ford Arm; T49S, R59E, Sec. 13, 23, 24, 25, 26
1974	L	Pat #1-40	1975	El Paso Natural Gas	Approx. 5 1/2 mi S.W. of head of Fick Cove
1974	L	Ram #9-32	1975	El Paso Natural Gas Roger H. George	Chichagof Island; T50S, R60E, Sec. 17
1974	L	Ushk #1-60	1975	El Paso Natural Gas	4 1/2 mi S.W. of head of Ushk Bay; T50S, R60E, Sec. 14, 15, 22, 23, 24, 25, 26, 27

Cable Claims

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1974	L	Cable #1-18	1976	El Paso Mining & Milling Co. (Roger H. George)	Near Little Bay S.W. of Mt. Douglas; T47S, R56E, Sec. 23

Stag Bay Copper & Magnetite Prospect

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1921	L	Fourth of July #1-8	———	A. Wilson, M. Truesdell, R. Phillips	Approx. 1 mi from shore at the S.E entrance Stag Bay, elev. approx. 1500 ft

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1924	L	Calko #1-2	———	S.H. Vevelstad, G. Comstock	S.W. side of Stag Bay at its junction with Lisianski Strait, elev. approx. 1800 ft from tidewater cc #2 adjoins S.E. end of #1
1926	L	Chichagof Copper #1-2	———	S.H. Vevelstad, G. Comstock	S.W. Side of Stag Bay at the junction with Lisianski Inlet approx. 1800 ft from tidewater cc #2 adjoins cc #1 on the S.E. end
1931	L	Inspiration Copper & I.C. #2	———	C. Vevelstad	S.W. side of Stag Bay at its junction with Lisianski Strait approx. 1800 ft from tidewater
1934	L	Stag Bay Copper	———	Mrs. A. Nilsen	S.W. side of Stag Bay at junction with Lisianski Strait approx. 1800 ft from tidewater
1936	L	Lisianski Strait Copper	1949	S.H.P. Vevelstad	S.W. side of entrance to Stag Bay of junction with Lisianski approx. 1800 ft from tidewater
1941	L	Jeanette #1-20	1950	C. Vevelstad	Ridge on S. side of Stag Bay approx. 1/2 mi from tidewater & approx. 1/2 mi from junction of Stag Bay & Lisianski Strait elev. approx. 1500 ft
1955	L	Agnes Copper	———	C. Vevelstad	Stag Bay Copper
1957	L	Nurmahal Copper #1-10	———	T. Rustad	Stag Bay Copper
1959	L	Stag Bay Copper #1-10	1971	C. Vevelstad	Stag Bay Copper

Slim and Jim Prospect

Date Located	Type	Claims	Last A.W.	Locator (s)	Location Description
1916	L	Slim & Jim #1-11	1917	S. Vevelstad	On the E.S.E. side of Pt. Uray, approx. 2 mi W. of the Sea Level Copper mine