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OPEN-FILE REPORT

RECONNAISSANCE EXAMINATION OF SUNRISE CANYON MANGANESE Slocum Inlet, Alaska

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CONTENTS

ILLUSTRATIONS

TABLES

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RECONNAISSANCE EXAMINATION

OF

SUNRISE CANYON MANGANESE

SUMMARY

The Sunrise Canyon manganese property consists of 2 unpatented lode mining claims located 5-1/2 miles southeast of Slocum Inlet at 2200 to 3200 feet elevation. It is an undeveloped prospect in difficult terrain.

Several persistent manganese-bearing veins ranging in width from 0.1 feet to 3.5 feet occur in a broad zone of shcistose quartz-phyilite which can be traced for over a mile. The veins contain rhodocrosite, manganese dioxide (pyrolusite and/or manganite) and rhodonite; two channel samples from representative sections assayed 22.4 and 31.6 percent manganese across vein widths of 3.5 feet and 1.0 feet respectively. Rhodocrosite is the predominant mineral. Preliminary mineral-dressing tests failed to produce a marketable concentrate and indicated difficult problems in both the recovery of manganese and the rejection of silica.

INTRODUCTION

Several requests for an examination and the interesting samples submitted by the owner of the Sunrise Canyon manganese prospect resulted in a visit by two Bureau of Mines engineers 2/ on October 24, 1957. A previous attempt to reach the prospect (in September, 1954) had been frustrated by difficult access and adverse weather conditions terminating in heavy snowfall at the altitude of the deposit. The successful visit was made in one day by means of a helicopter based in Juneau. Time for the visit was necessarily limited and was cut even shorter by an approaching storm. Only a rough reconnaissance of the general area and a cursory sampling of the most accessible vein outcrops could be accomplished. This report records the observations and factual data resulting from the examination.

LOCATION AND ACCESSIBILITY

This prospect is situated at about 58°04'30" north latitude and 133°56' west longitude. Two lode claims have been located along the strike of the veins on both sides of a saddle divide between the head of the creek flowing northwesterly into Slocum Inlet and the drainage into a tributary of Limestone Creek, which flows into Limestone Inlet. The area is shown on the Taku River (A-6), Alaska topographic map, 1:63,360 series.

The map elevation of the divide is approximately 3000 feet in the saddle between the Slocum Inlet and Limestone Inlet drainages. The property is about 7-1/2 miles by trail from Limestone Inlet. It is about 5-1/2 miles up the creek southeast of Slocum Inlet. It may also be reached by a rather difficult trail from Taku Harbor. Transportation of supplies and shipments of ore would require construction of a road and possibly tramway facilities along the canyon from Slocum Inlet.

2/ R. L. Thorne, Supervising Mining Engineer, Bureau of Mines, Region I, Juneau, Alaska
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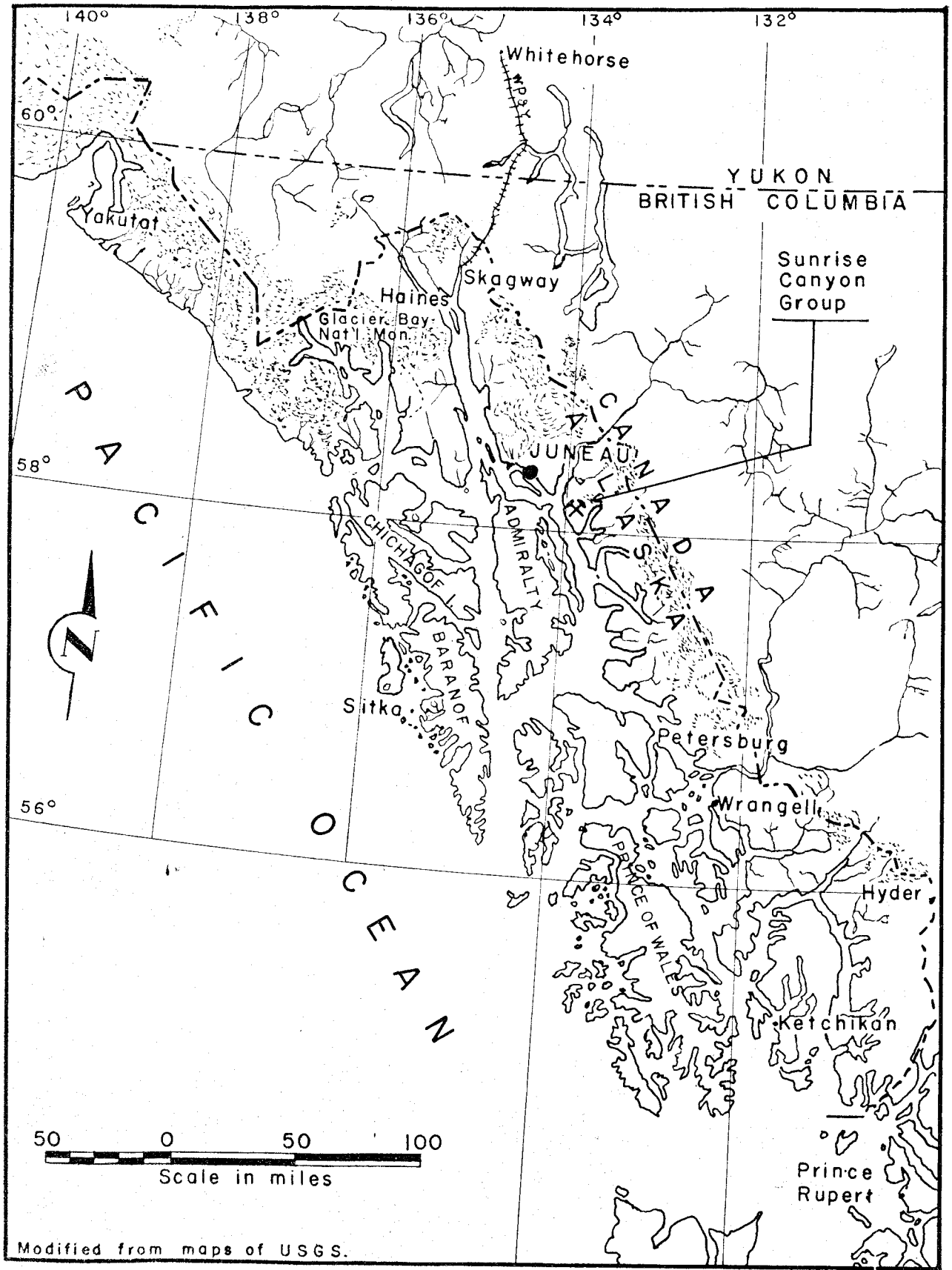

Figure 1.—Index map of Southeastern Alaska.

A helicopter can land on the divide or on the shore of a small lake lying 1 mile northwest of the divide and 1/4 mile southwest of the main canyon.

Slocum Inlet, Taku Harbor and Limestone Inlet are on the east side of Stephens Passage. They are approximately 17 miles, 21-1/2 miles and 24 miles south of Juneau, respectively.

Canyons are eroded along the general course of the vein-bearing zone both northwesterly and southeasterly from the divide. The best-known vein exposures are in the walls of the canyon to the northwest and this area is normally covered with snow until early fall. Surface examination is possible only during the remaining short period preceding the first autumn snow-falls.

HISTORY AND OWNERSHIP

Manganese veins were discovered by Henry T. Olson about 1935 and a group of 8 claims was located. These claims were named Sunrise Canyon No. 1 and No. 8. In 1953 claims Sunrise Canyon No. 9 to No. 16 were staked and the group was optioned by a Canadian firm. The option was dropped in 1955.

At present, Sunrise Canyon No. 1 and No. 2 claims are held by location jointly by Henry T. Olson of Taku Harbor, John Hermle of Juneau and J. F. Mullen of Juneau.

A few shallow pits and trenches, trail-building, and construction of a cabin at Slocum Inlet constitute the development work. There are no undergrould workings.

MINERAL DEPOSITS

General Geology

The manganese-bearing veins observed occur in a zone of very schistose grey-green quartz-phyllite striking about N. 50° W. and dipping form 45° to 85°northeasterly. The veins appear to be localized in the upper and more schistose 200 to 300 feet of a rather wide bed of phyllites and overlain by a more massive greenish rock believed to be a highly metamorphosed and schistose series of basaltic lavas and tuffs. These are members of the series of bedded rocks lying just west of the Coast Range Batholith and described by Buddington and Chapin 3/ as Mesozoic and Paleozoic sediments and volcanics. This series forms a major geologic feature extending from the vicinity of Port Houghton northwesterly past Juneau.

3/ Buddington, A. F. and Chapin, Theodore, Geology and Mineral Deposits of Southeastern Alaska; Geol. Survey Bull. 800, 1929, pp. 70-74.

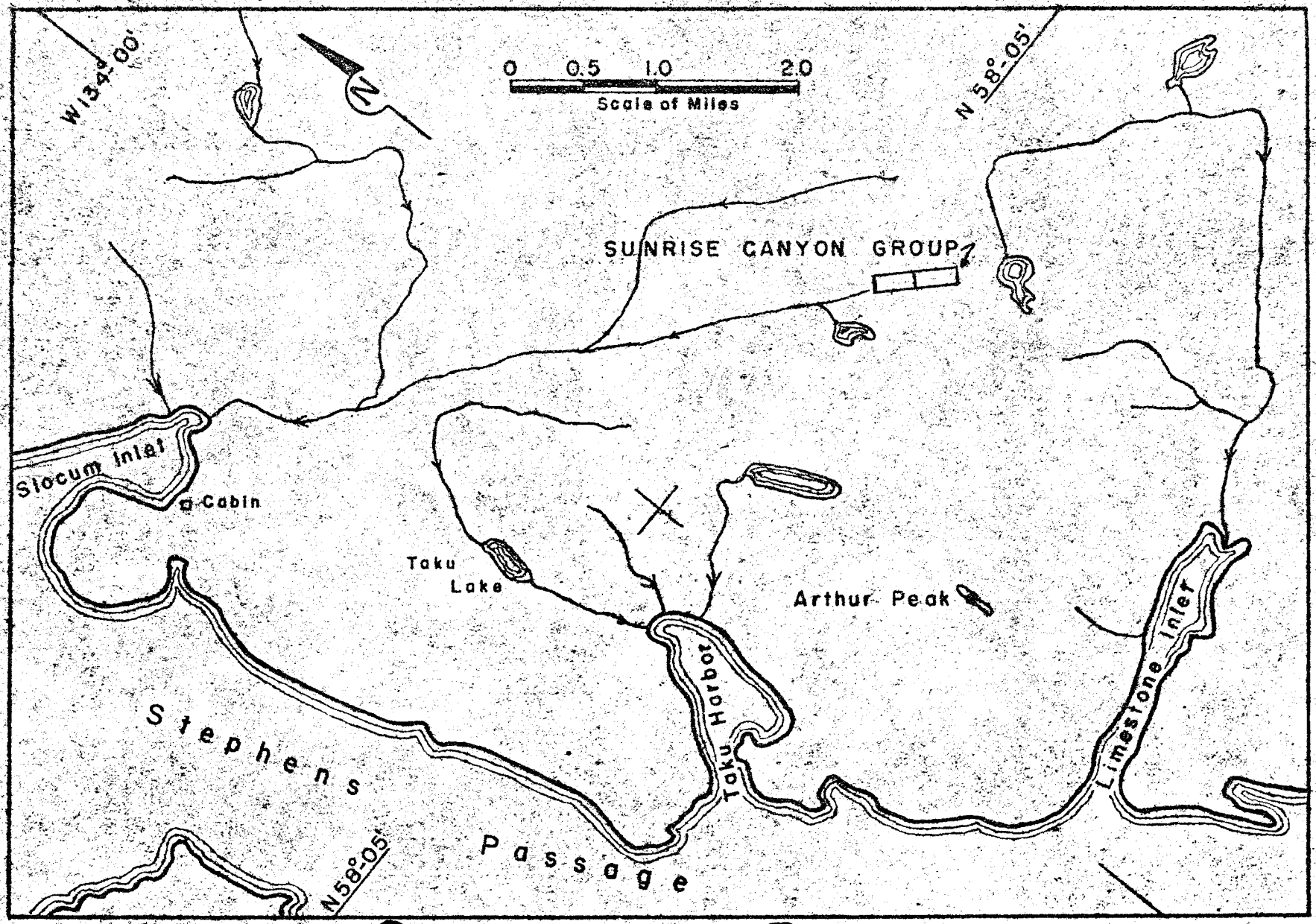

Figure 2. Location of Sunrise Canyon Group.

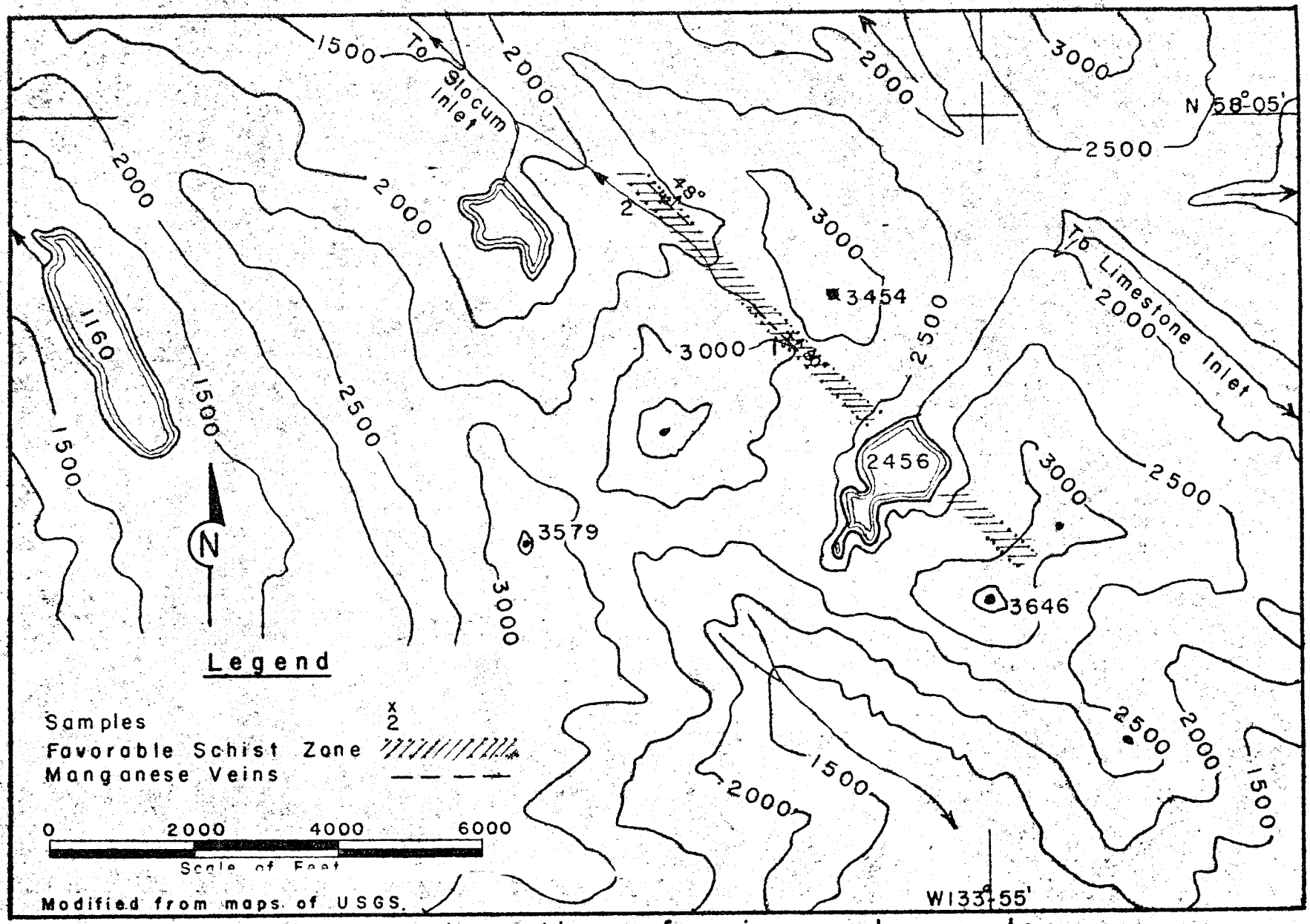

Figure 3.- Location of veins and samples.

Ore Deposit

A manganese vein varying in width from about a foot to 3.5 feet outcrops about 100 feet up the slope southwest of the divide, above the short talus slope. The observed strike was about N. 50° W. and the dip was about 80° N.E. A shallow cover of small rocks and moss partially masks the outcrop. Considerable amounts of float ranging in size from pebbles to small boulders are found in the saddle and up the slope to this vein, which appears to lie near the footwall of the favorable zone. No float was found up-slope above the vein. The phyllites become less finely foliated and stand out as a series of small bluffs and cliffs.

Southeast of the divide on the Limestone Inlet drainage the vein appears to increase in quarts content and decrease in width but is exposed for a few yards only. The phyllite zone was evident, with some siliceous and iron-stained outcrops visible, down the floor of the canyon for about 0.3 miles to the shore of a lake at an elevation of 2456 feet. Two buff-colored zones are visible on the line of strike from the upper edge of the talus slope to the top of the ridge 0.3 miles southeast of the lake. This area was not inspected because of lack of available time but should be carefully examined for possible veins if additional work is done on the known deposit. Henry Olson stated that he had visited this area but had not found any manganese float.

About 100 feet northwest of the divide a shallow trench was dug and the vein sampled. It contained 22.4 percent manganese over a vein width of 3.5 feet. Assay results are shown in Table 1. Spectrographic analysis is shown in Table 2. Petrographic examination of an ore specimen from this location showed that it contained an estimated 70 percent rhodocrosite, 15 percent manganese dioxide, 10 percent quartz and 5 percent rhodonite. This is sample 1 in Table 3. A specimen from near the hanging wall of the vein filling was composed of quartz and a manganese dioxide mineral tentatively identified as manganite. Some psilomelane may be present. This specimen is described as sample 5 in Table 3.

The course of the vein was traced by plentiful float and frequent partially-covered outcrops for several hundred feet northwesterly. The vein appears to be concordant with the schistocity in both strike and dip over its observed strike length and to vary from 1 foot to 3.5 feet in width.

The vein intersects the northwesterly axis of the canyon at a small angle and disappears under wash and slide as it approaches the creek bed.

Distribution of float and pueces of jasper or jasperoid rock on the floor of the canyon and base of the northeast slope suggests the probable occurrence of other veins paralleling the one described above. Sample 4 in Table 3 is jasperoid rock.

The apparently favorable schist horizon emerages from a talus area on the northeast side of thecanyon, about 50 feet above the creek and 0.5 miles northwest of the divide. It strikes about N. 45° W. and dips 48° N. E. Several narrow interbedded veins or bands of manganese ore are visible in this bluff and can be traced for about 300 feet along it before it flattens and the outcrop is again covered with overburden. These bands are individually from 0.1 to 0.5 feet wide and very uniform in thickness. Immediately northwest of this point the hanging wall portion of the schist is exposed for a width of possibly 30 feet and a length of about 100 feet. It is about 80 feet above the creek at an elevation of approximately 2300 feet. A vein 1.0 foot wide, striking N. 45° W. and dipping 48° N.E. is exposed. A cut sample from it assaying 31.6 percent manganese is listed as sample 2 in Table 1. Spectrographic analysis of this sample is shown in Table 2. Other small parallel veins are indicated in this area. There is evidence of probable minor cross- faulting with possible several feet of displacement of the northwesterly block to the northeast near this outcrop and in the cliff exposure of the rock overlying the phyllite schist.

Farther northwest the vein is again covered but considerable float was observed.

The veins or bands of manganese minerals appear to be remarkable uniform for their observed strike lengths. An even thinly-banded texture is typical in two of the narrow veins in the bluff near the northwest end of the area examined. Samples of vein material and phyllite from both foot and hanging wall were taken for petrographic study; the vein material (sampel 2) and the wall rock (sample 3) are described in Table 3. It was hoped that a petrographic study of these samples might indicate specifically whether the manganese was an original bedded component of a sedimentary rock or introduced by later mineralizing processes but the results of the study were inconclusive.

TABLE 1. - Chemcial analysis of samples

Sample	Location	Sample Length, ft.	Assay, percent			Oz. per Ton	
			Mn	Fe	SiO_2	Au	Ag
1	3.5-ft. vein, S.W. of divide	3.5	22.4	1.32	55.2	0.06	*0.02
2	1.0-ft. vein, N.E. of creek	1.0	31.6	3.54	38.0	*0.02	*0.02

* Less than

TABLE 2. - Spectrographic analysis

Sample	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Ce	Cd	Co	Cr	Cu	Fe	Ga	Ge	Hg
1	-	B	-	-	F	D	-	-	C	-	-	F	E	F	C	-	-	-
2	-	A	-	-	F	D	G	-	C	-	-	E	E	F	C	-	-	-

Sample	In	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Pd	Sb	Si	Sn	Sr	Ta	Te	Ti
1	-	-	D	A	E	E	-	D	-	-	-	-	A	-	-	-	-	E
2	-	-	C	A	E	D	-	D	-	-	-	-	A	-	-	-	-	D

Sample	V	W	Zn	Zr
1	E	-	-	F
2	E	-	-	-

Legend:
A - more than 10 percent
B - 5 to 10 percent
C - 1 to 5 percent
D - o.1 to 1 percent
E - 0.01 to 0.1 percent
F - 0.001 to 0.01 percent
G - less than 0.001 percent

TABLE 3. - Petrographic analyses

Sample No.	Description
1	Ore from 3.5-foot vein: Estimated 70 percent rhodocrosite, 15 percent manganes dioxide, 10 percent quarts and 5 percent rhodonite.
2	Ore from 0.5-foot vein N.E. of creek: Quartz and manganese dioxide with minor amounts of limonite and spessartite. Trace of chlorite. Provisionally identified as banded gneiss whose chemical components are probably of sedimentary origin.
3	Wall rock from verin in sample 2: Green phyllite containing quartz, fine chlorite and hydromuscovite. Probably of sedimentary origin. Manganese and trace of zinc are present.
4	Reddish-brown jasperoid, N.W. of saddle: Chert and hematite, with traces of Mn and Zn. No Ti, V or Cr. Grain size under 10 microns.
5	Siliceous ore at hanging wall of 3.5-foot vein: Quartz and a manganese dioxide mineral probably manganite. Some barium so psilomelane may be present.

BENEFICIATION TESTS

Preliminary ore-dressing studies were made in the Juneau laboratory of the Bureau of Mines on a sample of ore from the Sunrise Canyon Group submitted by Henry T. Olson, the locator.

The sample tested contained rhodocrosite intimately associated with quartz, manganese oxide and manganese silicates. Rhodocrosite was mostly liberated in the plus 48-mesh fraction but with some locking in the plus 35-mesh size. Much of the pyrolusite remains locked with quartz, rhodonite and some rhodocrosite through the minus 200-mesh sizes. A representative head sample assayed 40.6 percent Mn, 18.6 percent SiO_2 and 1.5 percent Al_{203}.

Testing procedures utilized failed to produce a marketable concentrate containing over 48 percent manganese with less than 15 percent silica plus alumina and a satisfactory recovery. Rejection of quartz was unsatisfactory. Sizing, direct sintering, tabling and flotation procedures were used. The sintering and flotation results are summarized in Table 4. No significant concentration was evident in any of the sized products from a sample roll-crushed to minus 10-mesh. Table concentration was ineffective on ore roll-crushed to minus 20-mesh.

TABLE 4. - Summary of sintering and flotation tests

Product	Weight percent	Assay, percent Mn	SiO_2	Al_2O_3	Distr. % Mn
Direct Sintering:					
Sinter (1 hr. at 1000° C.)		48.7	22.3	1.9	100.0
Heads	100.0	40.6	18.6	1.5	100.0
Fatty-Acid Flotation					
Concentrate	27.31	40.7	7.1	1.2	29.1
Cleaner Tail	22.33	40.3			22.9
Rougher tail	50.36	39.9			48.0
Calc. head	100.00	40.2	7.1	1.2	100.0
Sintered concentrate		54.5	10.2	1.8	29.1
Emulsion Flotation:					
Concentrate	50.40	41.8	9.3	1.6	53.3
Cleaner tail 3	1.06	39.2	17.7	1.6	1.0
Cleaner tail 2	2.12	36.8	23.7	1.7	2.0
Cleaner tail 1	8.32	36.4	22.6	1.5	7.7
Rougher tail	38.10	37.3	27.5	1.9	36.0
Calc. head	100.00	39.5		1.6	100.0
Sintered concentrate		53.1	12.1	1.7	53.3