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War Minerals Report 361

TOLSTOI MOUNTAIN
KASAAN PENINSULA, PRINCE OF WALES ISLAND
SOUTHEASTERN ALASKA

Iron, Copper

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WAR MINERALS REPORT
UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

W.M.R. 361 - Iron, Copper March 1945

TOLSTOI MOUNTAIN
Kasaan Peninsula, Prince of Wales Island
Southeastern Alaska

SUMMARY

As part of iron and copper investigations by the Bureau of Mines in Southeastern Alaska, a preliminary examination of magnetite prospects on Tolstoi Mountain was made in July 1943. Data gathered were sufficiently favorable so that it was decided to explore the deposits further.

During the spring of 1944 a project entailing topographical and dip-needle surveying was conducted on the prospects. Inferred reserves of 21,150 tons of magnetite-bearing rock assayed 35.5 percent iron and 0.14 percent copper. There are no measured or indicated reserves.

No further work by the Bureau of Mines is proposed.

INTRODUCTION

Magnetite-iron deposits on Tolstoi Mountain were examined as part of the investigations by the Bureau of Mines of iron and copper ores on Prince of Wales Island.

A preliminary examination was made by an engineer [1] of the Bureau and three geologists [2] of the Federal Geological Survey on July 14, 1943. Three samples were taken, rough estimates were made, and it was proposed that the area be mapped topographically and geologically. Dip-needle work was added to the program and, should results warrant, the deposits were to have been diamond-drilled.

From March 26 to May 28, 1944, the deposits were examined thoroughly by the Bureau. [3] Thirty-two acres were mapped with contour intervals of 10 feet, grids were established covering the principal outcrops over 1,500 dip-needle readings were obtained, and the magnetite bodies were outlined. Additional information was obtained from 600 linear feet of trenching and 32 channel samples. The mapped area was checked for non-outcropping deposits by taking dip-needle readings at 10-foot intervals along the traverse lines, creeks, trails, and all outstanding topographical

1 Stephen P. Holt.
2 John Reed, L. A. Warner, and William Twenhofel.
3 Aner W. Erickson, in charge of field exploration.

features. This reconnaissance work provided enough information to eliminate the possibility that other magnetite bodies of any consequence remained undiscovered.

LOCATION AND ACCESSIBILITY

The deposits are on Prince of Wales Island, in Southeastern Alaska, near Tolstoi Bay, a deep-water indentation at the northwest end of Kasaan Peninsula. The physical features are shown on figure 1. Old workings were found on the west side of Tolstoi Mountain between elevations of 650 and 1,150 feet at distances of 3/4 to 1-1/4 miles from the east shore of Tolstoi Bay.

Access to the area is over a brushed foot trail built by the Bureau of Mines. Topography would permit construction of either surface or aerial tramways at moderate cost but would make road building expensive. Deep-water navigation, which would permit inexpensive water transportation, is possible the year around.

PHYSICAL FEATURES AND CLIMATE

Kasaan Peninsula is an area of moderate relief, being considerably less rugged than the mainland to the east. Most of the mountains and ridges are less than 2,500 feet high and show evidence of having been covered by the ice cap of the Pleistocene age. There are few rock exposures below 2,000 feet altitude as extensive overburden 2 to 20 feet deep covers the greater part of the peninsula.

Timber and vegetation are abundant throughout the lower flanks of the area and hinder exploration of prospects. Ample mine timber is available, mostly western and black hemlock and Sitka spruce. The underbrush consists mainly of huckleberry, salmonberry, and cranberry bushes intermingled with considerable devils' club, a shrub covered with sharp thorns.

The climate is characterized by moderate temperatures throughout the year. Precipitation is heavy and, although disagreeable, is an asset in that it makes available many potential sources of water power.

Snowfall at the lower elevations is moderate, there seldom being more than a foot or two on the ground at any time. Rarely is there appreciable snowfall before December, and usually all snow has melted by April.

Weather records kept for 14 years at Ketchikan, 40 miles southeast of the prospect, show an average annual precipitation of 156.51 inches, and an average annual temperature of 43.8 degrees Fahrenheit.

LABOR AND LIVING CONDITIONS

Labor is not available near the property. Workers would have to be brought from Ketchikan or from the United States for large operations.

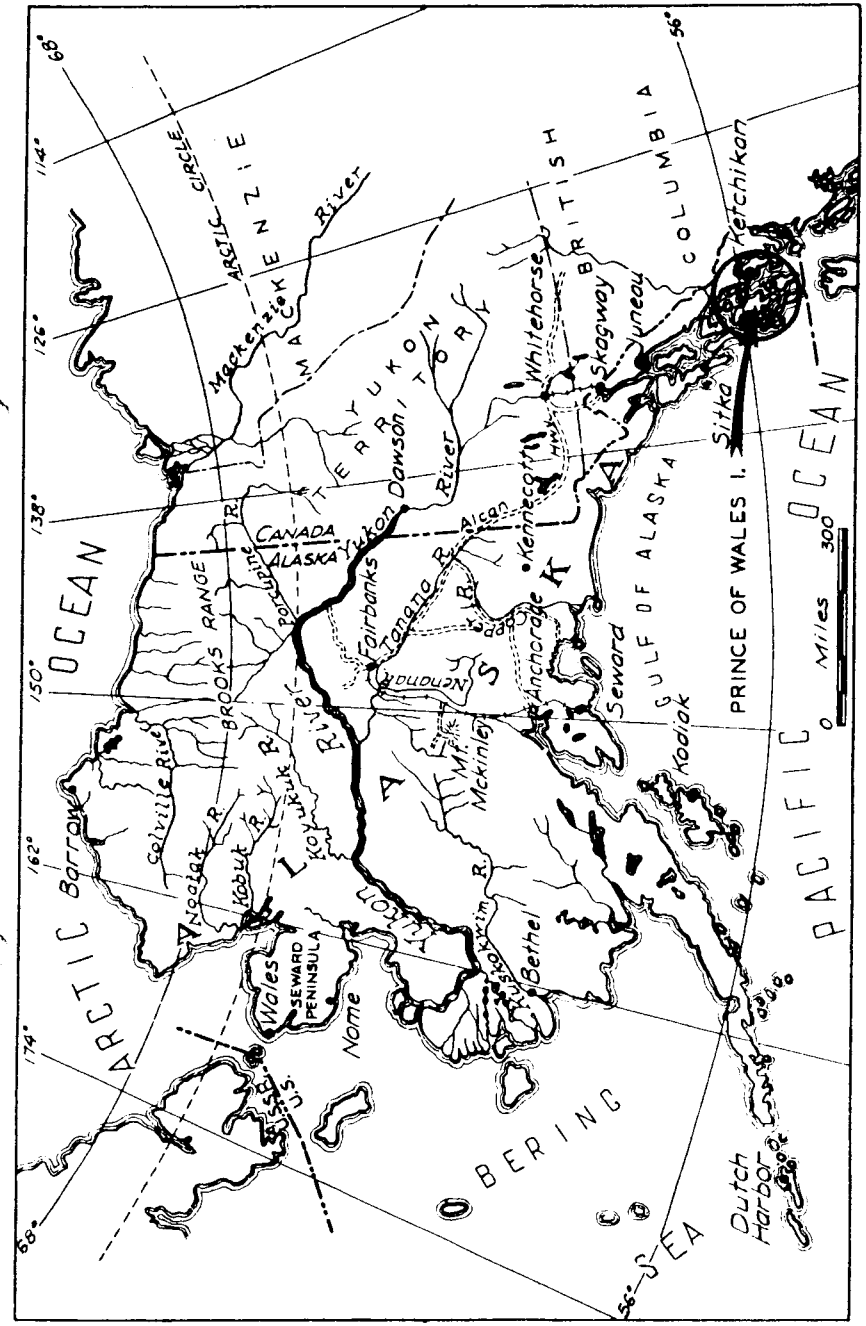

FIG. 1.- INDEX MAP OF ALASKA SHOWING LOCATION OF PRINCE OF WALES I.

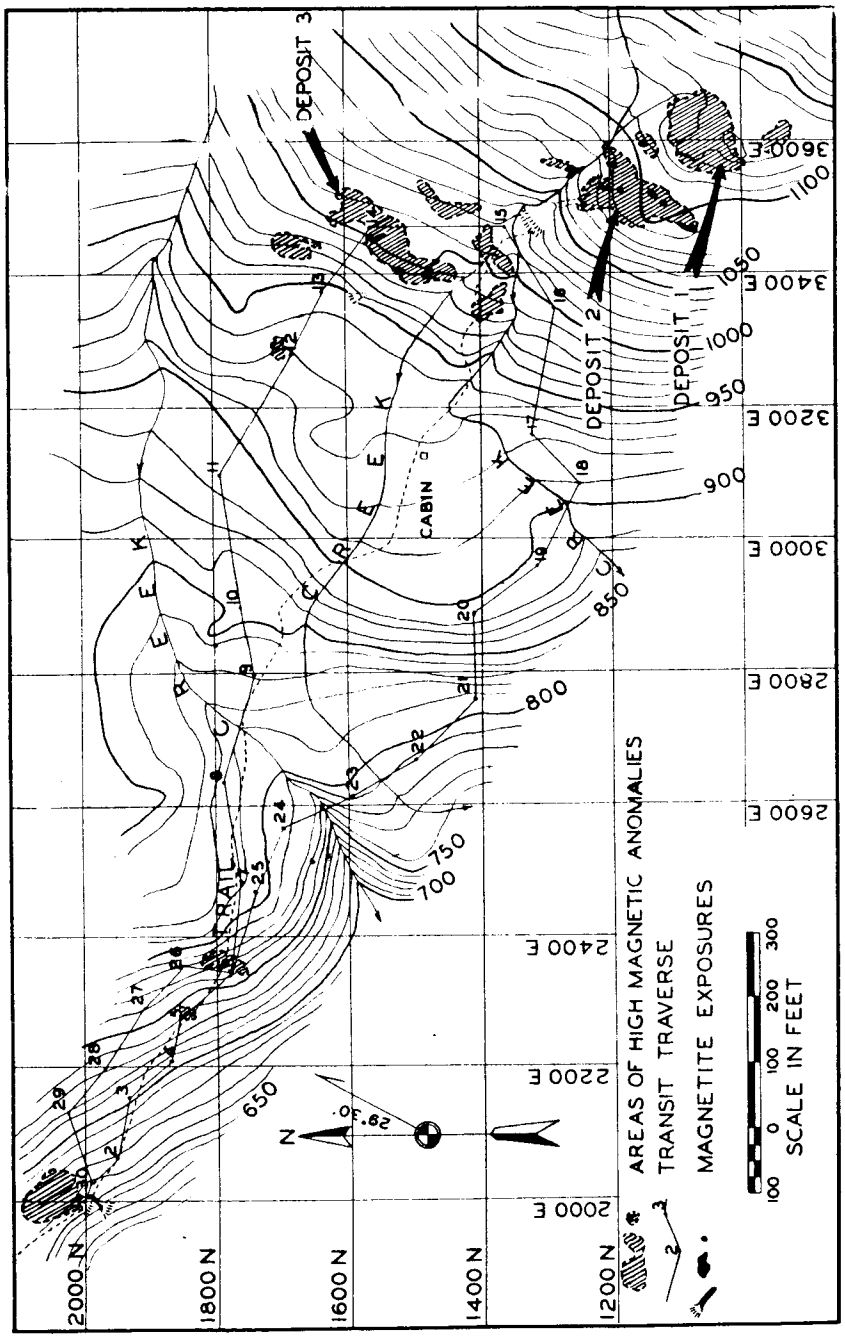

FIG. 2.- INDEX MAP OF AREA INVESTIGATED ON TOLSTOI MOUNTAIN

It is inferred that the mineralizing solutions ascended along the jointing planes, replacing the more clastic beds a few feet outward from these cracks. The extent of replacement in the zone composing deposit 3 was not determined, as heavy overburden makes it impracticable. It is estimated from available data that not over 35 percent of the greenstone tuff has been effected.

A number of other scattered deposits giving high magnetic anomalies are shown on figure 2. As intensities were lower and areas were smaller than deposits 1, 2, and 3, the deposits were not investigated in detail.

CHARACTER OF MINERALIZATION

Mineralization is typical of the contact iron deposits of Kasaan Peninsula. The ore mineral is magnetite, carrying small amounts of chalcopyrite and pyrite. Gangue minerals noted were garnet, epidote, calcite, and quartz.

SAMPLING AND ANALYSIS

Thirty-two channel samples were cut from deposits 1, 2, and 3. Grooves were 4 inches wide by 2 inches deep.

All analyses were made by the Territorial Department of Mines[7] at Ketchikan. Samples were tested for iron and copper only, sulfur and phosphorus having been determined previously to be within allowable limits.

ORE RESERVES

The prospects contain no measured or indicated ore.

In deposit 1, the reserves of inferred ore in an ore body 80 by 80 feet and 4 feet thick, using a factor of 8 cubic feet to a ton of ore, amount to 3,200 tons containing 29.1 percent iron and 0.09 percent copper.

In deposit 2, the reserves of inferred ore in the ore body 50 by 180 feet and 6 feet thick amount to 6,750 tons containing 46.8 percent iron and 0.24 percent copper.

In deposit 3 it is estimated that not over 35 percent of the tuff strata has been replaced or partly replaced by magnetite, and in this ore body, 22 by 130 feet and 7 feet thick, the reserves amount to 1,200 tons. It is assumed that this ore contains 35.6 percent iron and 0.04 percent copper.

Other Deposits

No measurements or samples were taken on the remaining scattered deposits shown in figure 2. It is estimated from the dip-needle work, however, that not more than 10,000 additional tons of magnetite-bearing rock might be developed, the grade of which has been assumed at 30 percent iron and 0.05 percent copper. A summary of reserves follows:

7 Nils Johannsen, assayer.

Deposits	Tons			Analysis, percent	
	Measured	Indicated	Inferred	Iron	Copper
1	None	None	3,200	29.1	0.09
2	do.	do.	6,750	46.8	.24
3	do.	do.	1,200	35.6	.04
Others	do.	do.	10,000	30.0	.05
Total			21,150		
Average				35.5	.14

CONCLUSIONS

As both grade and tonnage are very low, no additional work on the deposits by the Bureau of Mines is proposed.

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