# Copper Deposits at the Rush and Brown Mine and Venus Prospect, Prince of Wales Island, Southeastern Alaska

By

L. A. Warner, R. G. Ray, and G. M. Flint, Jr.

Contents



Illustrations

# Copper deposits at the Rush and Brown Mine and Venus Prospect, Prince of Wales Island, Southeastern Alaska

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## INTRODUCTION

The Rush and Brown mine and the Venus prospect are near the head of Kasaan Bay about 10 miles northwest of the village of Kasaan and about 45 miles northwest of Ketchikan, the nearest port. (See fig. 1.) They are in an area of moderate relief in which some hills are a little more than 500 feet high. Much of the area is covered with glacial drift and dense vegetation. Muskegs are numerous. Outcrops are scarce and are confined mostly to steep slopes, stream beds, and places where development work has been done on the ore deposits. Topographic, geologic, and magnetic surveys of the vicinities of the ore deposits were made by the Geological Survey in 1943, and a brief examination of a portion of the underground workings at the Rush and Brown mine was made in 1944.

The area is underlain principally by greenstone which has been intruded by bodies of pyroxenite, gabbro, and diorite. Foliation in the greenstone is obscure. Most of the intrusive bodies trend northwesterly.

The principal ore deposits are veins containing chiefly pyrite, chalcopyrite, and pyrrhotite. A few deposits of copper-bearing magnetite have been found. Most of these are small, but a larger one at the Rush and Brown mine has been mined for its copper and precious metals.

## RUSH AND BROWN MINE

### Location, History, and Production

The Rush and Brown mine is about 2½ miles northwest of the nearest open water. (See fig. 1.) A salt-water lagoon known as the Salt Chuck extends to within a mile of the mine and can accommodate shallow draft boats and barges at high tide.

The deposit was discovered about 1900 by U. S. Rush and his partner. Development work was begun on the property in 1904[1/] and ore was mined almost continuously from 1906 to 1943, first by the Alaska Copper Company and later by U. S. Rush, the owner. During most of the interval in which

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1/ Wright, C. W., Geology and ore deposits of Copper Mountain and Kasaan Peninsula: U. S. Geol. Survey Prof. Paper 87, p. 98, 1915.

the mine was operated, difficulty was experienced in finding a satisfactory smelter to handle the ore and according to U. S. Rush this was one of the principal causes, together with a slump in copper prices, for suspending operations in 1923.

According to the records of the Geological Survey, the mine has yielded a total of 42,743 tons of ore containing gold worth $136,820, silver worth $31,495, and copper worth $706,109.

In 1929 the Solar Development Company, a subsidiary of the Consolidated Mining and Smelting Company of Canada, took an option on the mine and is reported to have shipped a small amount of ore. The mine was unwatered and 128 samples of the ore were taken. At present the property is held by the Alaska Gold and Metals Company and is managed by A. L. Howard of Seattle, Washington.

## Development

The mine workings consist of a glory hole about 100 feet deep, a 200-foot shaft, and a series of levels connected by a working winze which extends to a vertical depth of more than 400 feet. (See figs. 4 and 6.) A crosscut connects the bottom of the shaft with the 200-foot level from which the workings winze was sunk. An inclined shaft extends from the surface to the 200-foot level. All of the mine below the 200-foot level is flooded.

A tunnel known as the Sawmill tunnel was driven by the Solar Development Company towards the workings from a point 1350 feet east of the shaft. (See fig. 2.) The tunnel, which is about 250 feet lower than the collar of the shaft, was designed to intersect the mine workings at about the 300-foot level. The tunnel is 1290 feet long and would have to be extended about 175 feet to intersect the mine workings.

The country rock on both sides of the tunnel has been explored by several diamond-drill holes. (See figs. 3 and 4.) Hole SDC-1 was drilled by the Solar Development Company in 1930. Holes RB-1, -5, -6, and -7 were drilled by the Bureau of Mines in 1943. Hole RB-7 encountered an opening, probably a fault, through which the workings drained to the 200-foot level. The relation of the diamond-drill holes to the vein is shown in the isometric block diagram (fig. 4) compiled from maps furnished by the Consolidated Mining and Smelting Company of Canada.

## Geology

The principal rock at the Rush & Brown mine is greenstone, which is thought to have been derived chiefly from andesite. However, quartzitic and conglomeratic material were noted in places. From observations elsewhere on Kasaan Peninsula it is thought that these clastic materials are remnants of a sedimentary sequence of probable Paleozoic age. During Mesozoic time the Paleozoic rocks are believed to have been intruded by large sills of andesite, intrusion having been so complete in the region of Kasaan Peninsula as to break the sedimentary rocks into discontinuous slabs which now appear as crenulated

lenses and layers in the greenstone. Paleozoic formations which resemble the metamorphosed sediments included in the greenstone at Kasaan Peninsula form a large part of Prince of Wales Island.

Crystalline limestone, which is included in the greenstone in parts of Kasaan Peninsula, apparently is lacking in the vicinity of the Rush and Brown mine. In the glory hole masses of skarn, consisting mainly of garnet, epidote, calcite and diopside or hornblende, are associated with impure calcareous rocks which probably were of sedimentary origin.

Northeast of the main workings the greenstone was intruded by a large northwesterly trending dike-like body of gabbro and diorite which grades locally into pyroxenite. The southern part of this body is exposed in the Sawmill tunnel and is cut by diamond-drill holes RB-5, RB-6, and SDC-1. (See inset, fig. 3.) A smaller body, which is probably chiefly diorite, was encountered in drill hole RB-7, but is not exposed at the surface. Another large northwesterly trending body of gabbro and pyroxenite is exposed from 1500 feet to 2500 feet west of the mine. (See fig. 2.) Mafic dikes are the youngest rocks in the area and are exposed in the tunnel and near the glory hole. Silicic dikes, which are common in the central part of Kasaan Peninsula, are virtually absent in the vicinity of the Rush and Brown mine.

## Ore Deposits

Production from the Rush and Brown mine has been from the magnetite body and the sulfide-bearing vein.

The ore mined from the glory hole was essentially magnetite containing small amounts of pyrite and chalcopyrite. Magnetite and skarn replaced brecciated greenstone and calcareous clastic rocks and the sulfide minerals were deposited in a network of minute fractures which cut the magnetite. The ore comprised an east-west trending lens with a nearly vertical dip. A block of ore about 160 feet long, 40 to 50 feet thick, and 100 feet deep has been mined out. Some magnetite, apparently too low in copper to mine, is exposed at the east end of the glory hole in the workings 30 feet above the 100-foot level. (See fig. 5.) This body is about 20 feet wide and extends in an east-west direction for at least 90 feet. No magnetite was seen in the 200-foot level directly below the glory hole. Dip-needle readings were taken over a wide area around the glory hole and the anomalies decrease sharply a few feet away from the exposed ore.

The sulfide-bearing vein, which was the principal source of ore at the Rush and Brown mine, crops out about 150 feet northwest of the glory hole. (See fig. 3.) At the surface the strike of the vein is about N. 60° E., and at the 100-foot level is about N. 55° E. (See fig. 5.) On the 200-foot level near the inclined shaft the strike of the vein is about N. 55° E. A fault trending about N. 20° W., known as Murphy's slip, joins the vein southwest of the shaft, and west of the fault the strike of the vein is about N. 35° E. At lower levels the strike is said to swing to the east and to be nearly E. in places on the 400-foot and the 450-foot levels. The dip of the vein at the surface is about 60° S.E. The dip decreases downward to about 55° at the 200-foot level and it is reported to be 30° at the 500-foot level.

On the 200-foot level Murphy's slip has been followed southward for nearly 500-feet. Near the vein the slip dips about 40° E. Southward the dip increases to about 75° E. No deposits were found along the fault except for a ½-foot calcite vein containing a little chalcopyrite about 35 feet from the face of the drift. West of the junction of Murphy's slip and the sulfide vein there was a small chalcopyrite-bearing magnetite deposit which has been largely stoped out. Magnetite is also reported to occur on the 250-foot and the 350-foot levels.

All of the ore in the vein has been removed from the workings that were accessible in 1944. In places the stopes are 14 feet wide. According to Mertie2/, "The sulphide ore, chiefly chalcopyrite with some pyrite and pyrrhotite, occurs in lenses and reticulating veins and veinlets within the sheared material, more commonly nearer to the hanging wall than to the foot-wall. Some solid veins of chalcopyrite have been found, of which the largest so far mined has not exceeded 4 feet in thickness. The gangue material consists of crushed country rock, rather than gangue minerals such as quartz or calcite. The two walls evidently represent the outer limits of movement, for they are slickensided, and the sheared and crushed vein material ends abruptly against them."

A study of analyses of the samples taken in the workings by the Solar Development Company fails to show any pronounced major trend to the ore shoot. (See fig. 7.) Apparently the shoot is lenticular in general but is irregular in width and stope length. Although the shoot on the 500-foot level is somewhat shorter than on some of the levels above, the evidence is not conclusive that this indicates the final pinching out of the lens downward. The few analyses available indicate that the ore at the bottom of the mine is similar in grade to the ore previously mined.

The transition from high-grade ore to low-grade material is generally sharp, taking place within a few feet along the strike of the vein.

A smaller vein is exposed in a trench about 150 feet south of the glory hole. The chief minerals are pyrite and chalcopyrite. The calcite and chalcopyrite encountered near the face of the south drift on the fault on the 200-foot level may represent the downward extension of this vein.

Another sulfide-bearing vein is exposed 3800 feet S. 74° W. of the glory hole and at the west end of a small lake. (See fig. 2.) In general the vein trends about N. 75° E. but at its western end, the strike is more easterly. The dip ranges from 85° S. to vertical. The deposit consists of two mineralized shear zones, each about 2 feet wide and separated by 2 to 3 feet of barren greenstone. Ore is exposed intermittently for 200 feet or more along the strike. Pyrrhotite and pyrite are the chief ore minerals.

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2/ Mertie, J. B., Jr., Lode mining in the Juneau and Ketchikan districts: U. S. Geol. Survey Bull. 714, pp. 119-121, 1919.

A small, poorly exposed sulfide-bearing vein trending about N. 35° W. crops out on a hill south of the lake shown in figure 2. The principal minerals are pyrite and pyrrhotite.

## Reserves

The Rush and Brown mine workings were largely filled with water at the time the property was examined. The tonnage and grade figures given here are based on calculations made from maps and analyses furnished by the Consolidated Mining and Smelting Company of Canada and from data obtained from A. L. Howard. Assuming that the ore body continues below the 500-foot level for half of its 205-foot stope length and maintains an average width of 2.9 feet about 6000 tons of ore are indicated averaging 7.5 percent of copper, 0.92 ounces of silver, and 0.18 ounces of gold per ton. An additional 900 tons of ore averaging more than 6 percent of copper, 1.43 ounces of silver and 0.19 ounces of gold per ton remains in the old stopes and pillars. It is inferred that the block of ground between the 200-foot level and surface contains 5000 tons of ore. The copper content may average about 5 percent. The mine dump contains about 8000 tons derived from sorting operations to raise the grade of ore shipped from the vein. This ore is estimated to average 1.75 percent of copper, 0.30 ounces of silver per ton and 0.06 ounces of gold per ton.

The other sulfide deposits are poorly known and cannot at present be evaluated.

The magnetite ore deposit in the glory hole has been largely mined out for its copper content. The smaller body to the north of the east end of the glory hole, as exposed by workings, shows a small tonnage of magnetite containing an estimated 1 percent of sulfide minerals. This body has been explored along its strike for a distance of 90 feet and is known to be 20 feet wide at its western end. As there is no indication of the body on the surface about 35 feet above or on the 200-foot level about 120 feet below, the body can at most contain only a few tens of thousands of tons of magnetite ore.

## Suggestions for Further Mining and Exploration

Data obtained from maps and analyses furnished by the Consolidated Mining and Smelting Company of Canada indicate that the largest block of remaining higher grade ore probably lies below the 500-foot level. The mining of this ore and the remaining ore in the upper levels involves problems beyond the scope of this report. It may be pointed out, however, that extending the Sawmill tunnel approximately 175 feet to the vein workings would provide a haulage way for the ore and would drain the mine to approximately the 300-foot level.

The sulfide-bearing vein 3800 feet S. 74° W. of the glory hole seems to be of sufficient width and extent on the surface to indicate that it may extend to a considerable depth. The fact that the ore shoot at the Rush and Brown mine extended to considerably greater depth than could be surmised from its outcrop may be significant. Although a sample taken by the Geological Survey in 1943 and analyzed in its chemical laboratory showed

only 0.10 percent of copper, 0.07 percent of cobalt and a trace of nickel, it is possible that more extensive trenching and sampling would show the average ore to be of higher grade. The veins of this area are too little known to indicate any regional pattern.

## VENUS PROSPECT

By

R. G. Ray

The Venus prospect, also known as the Iron Creek No. 1 Lode Claim, is on the southwest side of Kasaan Bay 1 mile south of the Rush and Brown mine. (See fig. 1.) The prospect is about 1½ miles from tidewater and is at an elevation of 250 feet. The claim is owned by Fred Moeser of Ketchikan. During the summer of 1943 the U. S. Geological Survey made a brief examination of the area.

Present development consists of three long trenches totaling 800 feet and a short adit through 30 feet of glacial drift and about 45 feet of bedrock.

### Geology

Although largely covered by glacial drift and alluvium, the area surrounding the Venus prospect is thought to be underlain chiefly by greenstone. The greenstone in the Venus area ranges from a dark gray-green fine-grained rock to a coarser rock containing amphibole phenocrysts. Only one outcrop of igneous rock was found and its relationship to the surrounding greenstone is not known.

### Ore Deposit

The deposit is a vein of pyrrhotite with sphalerite, pyrite, and chalcopyrite. Quartz and calcite or dolomite are the chief gangue minerals. The vein strikes N. 85° E. and appears to dip steeply south. Ore is exposed for 200 feet in trench 3 (fig. 8) where the vein ranges in width from a few inches at its eastern end to a maximum of 6 feet at the westernmost exposure. The vein does not extend as far east as the east end of the trench. It probably extends at least 50 feet and may continue more than 100 feet west of the present westernmost exposure. Ore is also exposed at the face of the adit and in a small fault 40 feet in from the adit portal. This small fault appears to strike about N. 85° E. and may be the continuation of the vein exposed in trench 3. The exposed portion of the vein at its maximum width is massive sulfide ore though in other places the vein includes numerous small blocks of greenstone suggesting replacement along multiple fissures. Inclusions of greenstone in the ore may amount to 30 percent by volume of the vein.

### Reserves

Three samples of the ore were taken by the Bureau of Mines. Analyses are given in the following table:

| Sample No. | Location | Au | Ag | Cu | Fe | Zn | Ni |
|---|---|---|---|---|---|---|---|
| | | ounces | | percent | | | |
| 1 | 3-foot chip sample of pyrite and pyrrhotite at face of adit | 0.01 | 1.00 | 1.18 | 33.1 | 2.01 | Nil |
| 2 | 6 foot chip sample of pyrite and pyrrhotite vein (where maximum width of vein is exposed in trench 3). | 0.01 | Nil | 1.78 | 52.4 | 0.13 | Nil |
| 3 | Grab sample from 50 tons of ore in bin below dump. | 0.01 | 0.70 | 0.91 | 41.0 | 0.52 | Nil |

The ore body is at least 250 feet long and averages 2½ feet in width. As much as 30 percent by volume of greenstone may be present in the ore body. Assuming 7.65 cubic feet of ore per ton, it is estimated that the vein contains 81.7 tons per foot of depth. If the vein persists to a depth of 100 feet a little more than 8,000 tons of ore are indicated.

## Suggestions for Further Exploration

If the deposit is believed to justify further exploration, it is recommended that a shallow test shaft be sunk at the west end of trench 3 to explore the downward extension of the vein. Short trenches across the strike of the vein to the west of its present westernmost exposure would explore the possible extension of the vein in that direction.

The deposit could be further explored by drilling holes in a fanshaped pattern from a point south of trench 3 and approximately 50 feet lower than the surface exposures of the vein.

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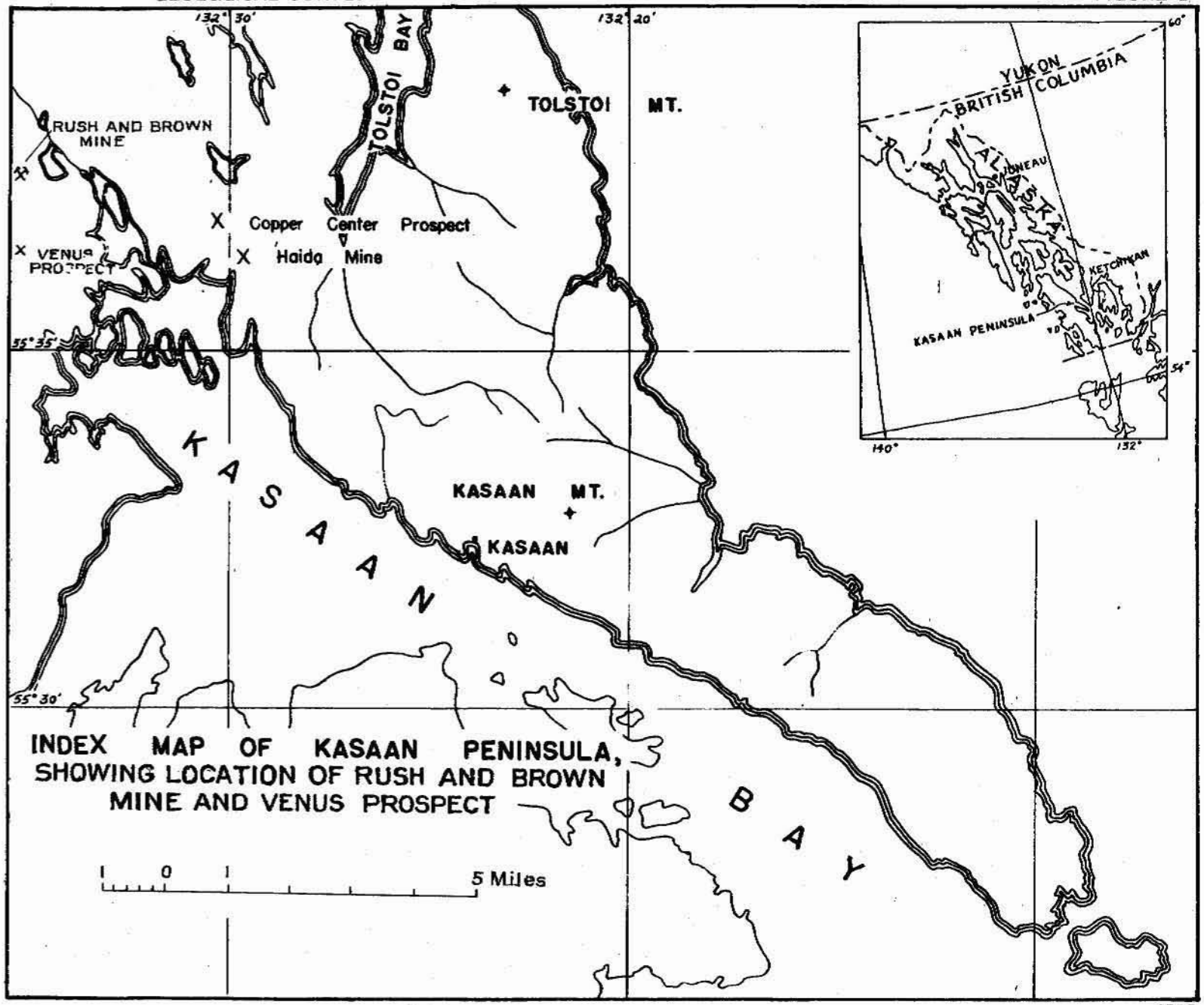
FIGURE 1




INDEX MAP OF KASAAN PENINSULA, SHOWING LOCATION OF RUSH AND BROWN MINE AND VENUS PROSPECT

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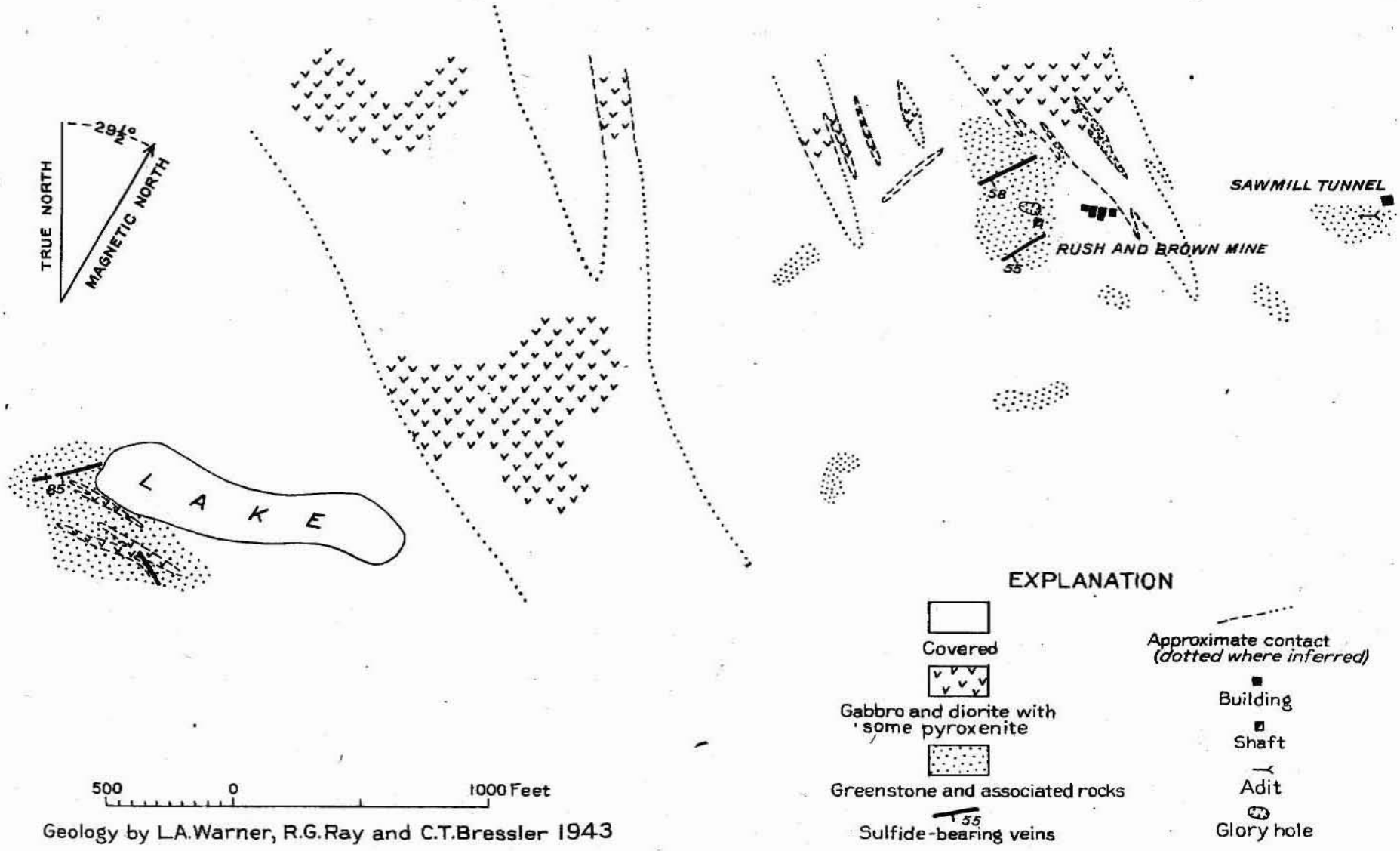
GEOLOGICAL SURVEY

FIGURE 2




Geology by L.A. Warner, R.G. Ray and C.T. Bressler 1943

# GENERALIZED GEOLOGIC MAP OF THE RUSH AND BROWN MINE AREA KASAAN PENINSULA, PRINCE OF WALES ISLAND, SOUTHEASTERN ALASKA

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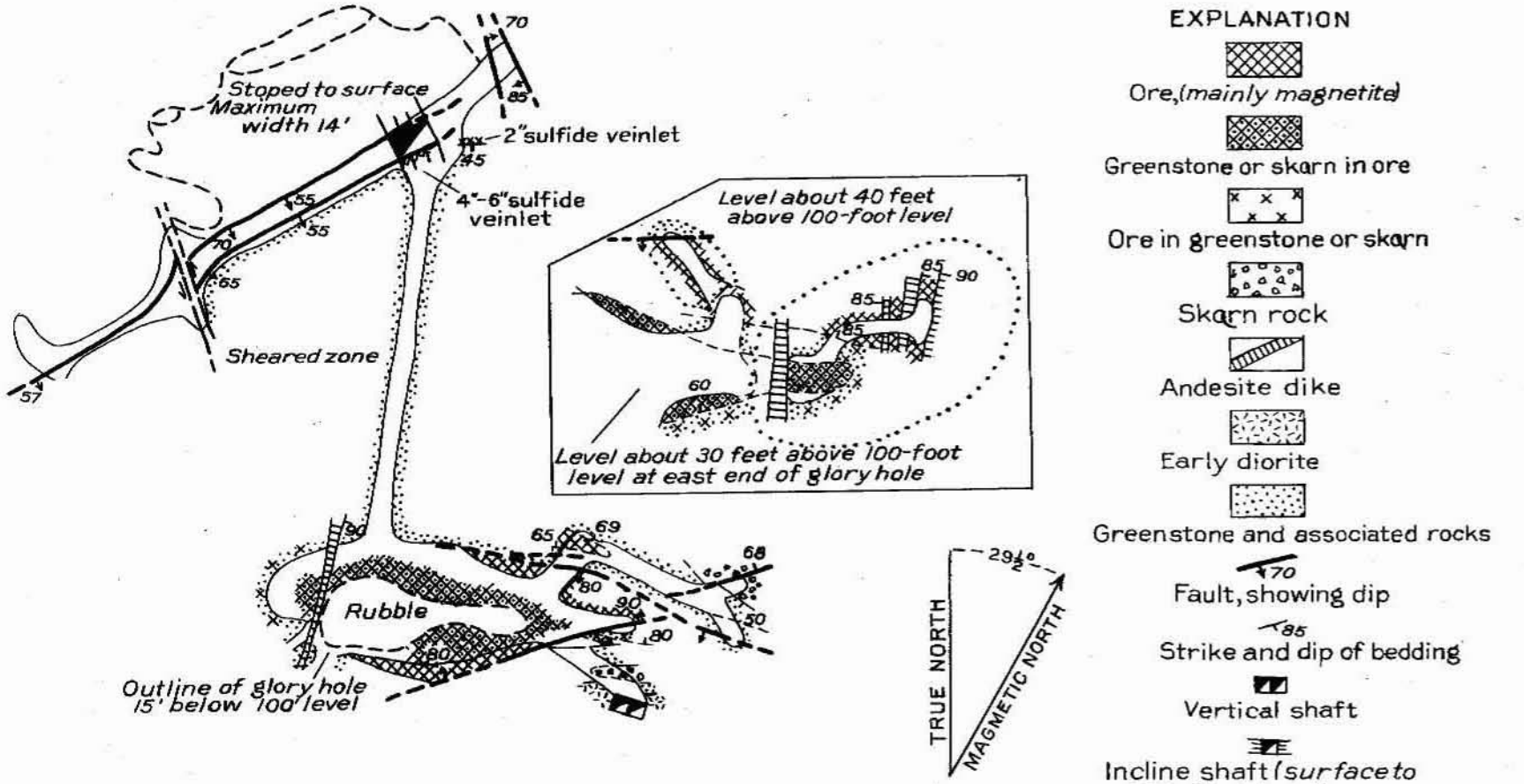
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

FIGURE 5




Geology by W.S. Twenhofel and L.A. Warner, 1944

# GEOLOGIC MAP OF THE 100-FOOT LEVEL RUSH AND BROWN MINE PRINCE OF WALES ISLAND SOUTHEASTERN ALASKA

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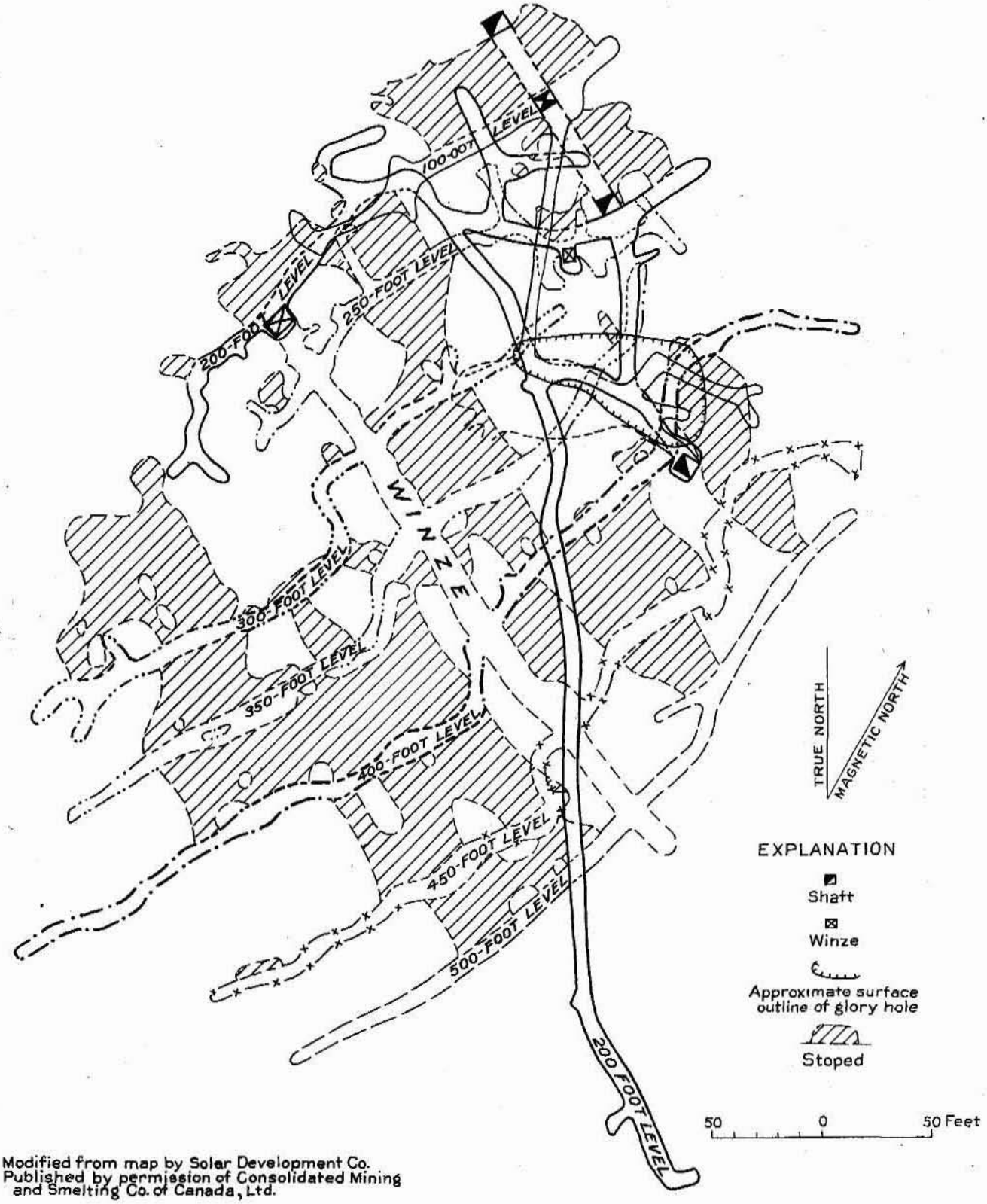
FIGURE 6




Modified from map by Solar Development Co.
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PLAN OF MAIN WORKINGS OF THE RUSH AND BROWN MINE
KASSAN PENINSULA, PRINCE OF WALES ISLAND, SOUTHEASTERN ALASKA 6787

UNITED STATES DEPARTMENT OF THE INTERIOR
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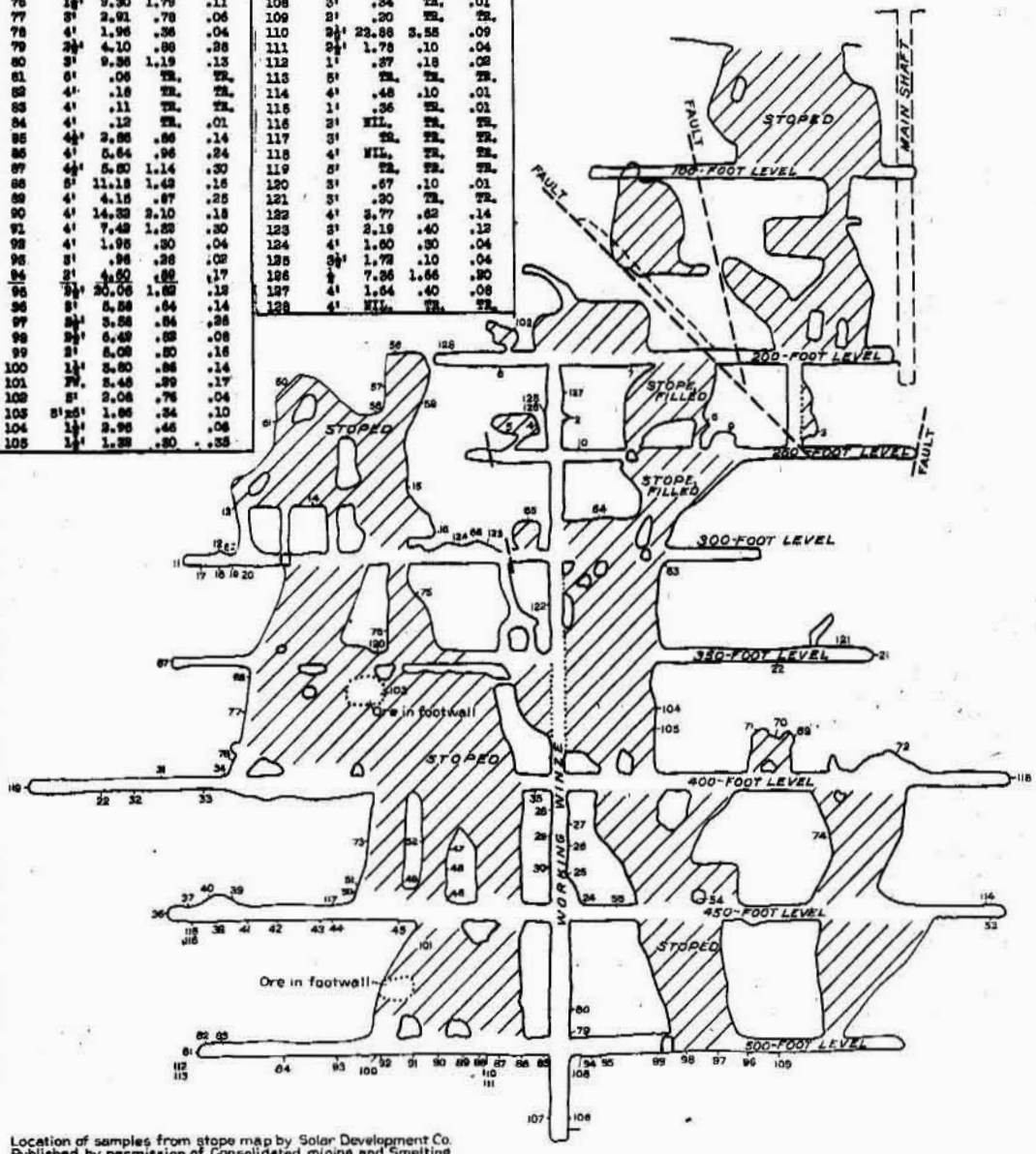
FIGURE 7

ANALYSES OF SAMPLE TAKEN AT RUSH AND BROWN MINE BY SOLAR DEVELOPMENT CO.
Furnished by Consolidated Mining and Smelting Co of Canada, Ltd.

| SAMPLE NO. | VEIN WIDTH IN FEET | PERCENT OF CU. | OZ. AG. | OZ. AU. |
|---|---|---|---|---|
| 1 | | 1.06 | TR. | TR. |
| 2 | 3' | 2.54 | .46 | .06 |
| 3 | 2' | 8.48 | 1.40 | .32 |
| 4 | 3' | 4.31 | .84 | .06 |
| 5 | 2½' | 1.72 | .54 | .04 |
| 6 | 4' | .98 | .24 | .02 |
| 7 | 2' | 2.72 | .56 | .13 |
| 8 | 1½' | 4.60 | .94 | .36 |
| 9 | 2½' | 3.90 | 1.02 | .26 |
| 10 | 3' | 1.41 | .44 | .06 |
| 11 | 3' | 1.00 | .42 | .06 |
| 12 | 5' | .22 | TR. | TR. |
| 13 | 3' | 5.72 | 1.45 | .19 |
| 14 | 2' | 16.24 | 2.80 | .26 |
| 15 | 2' | 5.26 | .97 | .27 |
| 16 | 1' | 5.98 | 1.47 | .39 |
| 17 | 4' | .72 | .19 | .06 |
| 18 | 4' | 2.00 | .54 | .06 |
| 19 | 4' | 4.96 | .87 | .08 |
| 20 | 4' | 1.86 | .52 | .04 |
| 21 | 5' | 4.92 | .65 | .09 |
| 22 | 2' | 6.78 | .66 | .20 |
| 23 | 3' | .74 | .20 | .02 |
| 24 | 2' | 4.15 | .76 | .40 |
| 25 | 3' | 6.54 | 1.41 | .21 |
| 26 | 3' | 2.86 | .53 | .27 |
| 27 | 2' | 7.40 | 1.40 | .18 |
| 28 | 4' | 8.36 | 1.56 | .32 |
| 29 | 4' | 10.20 | 1.66 | .14 |
| 30 | 4' | 6.82 | 1.46 | .10 |
| 31 | 2' | .38 | .17 | .08 |
| 32 | 3' | .48 | .14 | .04 |
| 33 | 3' | .84 | .17 | .08 |
| 34 | 3' | 1.06 | .18 | .02 |
| 35 | 3' | 8.98 | 1.28 | .19 |
| 36 | 2' | 1.18 | .34 | .02 |
| 37 | 1' | .54 | .10 | .02 |
| 38 | 3' | .58 | .14 | .02 |
| 39 | 2½' | .90 | .21 | .03 |
| 40 | 3' | 1.06 | TR. | .03 |
| 41 | 2' | .38 | TR. | .02 |
| 42 | 2' | .75 | .19 | .05 |
| 43 | 3½' | 1.00 | .19 | .05 |
| 44 | 2½' | 1.90 | .48 | .02 |
| 45 | 2' | 3.74 | .62 | .22 |
| 46 | 3' | 8.08 | 2.44 | .32 |
| 47 | 5' | 7.02 | 1.54 | .26 |
| 48 | 1½' | 5.21 | 1.40 | .24 |
| 49 | 2' | 8.02 | 2.23 | .17 |
| 50 | 5' | 1.74 | .54 | .10 |
| 51 | 7' | 6.12 | 1.28 | .08 |
| 52 | 2' | 2.76 | .80 | .16 |
| 53 | 3' | 1.70 | .10 | .03 |
| 54 | 2' | 8.41 | .87 | .05 |
| 55 | 3' | .88 | TR. | TR. |
| 56 | 6' | 1.04 | .10 | .04 |
| 57 | 6' | 3.76 | .86 | .09 |
| 58 | 5' | 2.94 | 1.04 | .10 |
| 59 | 1½' | 10.06 | 1.60 | .10 |
| 60 | 4' | 4.79 | 1.16 | .08 |
| 61 | 4' | 2.00 | .66 | .06 |
| 62 | 2' | 7.16 | 2.00 | .20 |
| 63 | 4' | 5.02 | .81 | .09 |
| 64 | 2½' | 3.94 | .78 | .17 |
| 65 | 5' | 3.38 | .74 | .22 |
| 66 | 2' | .87 | .12 | .04 |
| 67 | 3' | .14 | TR. | .01 |
| 68 | 1' | 11.72 | 2.08 | .08 |
| 69 | 3' | 6.66 | .82 | .20 |
| 70 | 2½' | 3.14 | .52 | .20 |
| 71 | 4' | 3.82 | .42 | .05 |
| 72 | 2½' | 2.20 | .27 | .06 |
| 73 | 1½' | 7.18 | 1.21 | .11 |
| 74 | 5' | 4.80 | .70 | .14 |
| 75 | 3' | 3.66 | .77 | .09 |
| 76 | 1½' | 9.30 | 1.79 | .11 |
| 77 | 3' | 2.91 | .78 | .06 |
| 78 | 4' | 1.96 | .36 | .04 |
| 79 | 2½' | 4.10 | .86 | .26 |
| 80 | 3' | 9.36 | 1.19 | .13 |
| 81 | 6' | .06 | TR. | TR. |
| 82 | 4' | .16 | TR. | TR. |
| 83 | 4' | .11 | TR. | TR. |
| 84 | 4' | .12 | TR. | .01 |
| 85 | 4½' | 2.86 | .86 | .14 |
| 86 | 4' | 5.64 | .96 | .24 |
| 87 | 4½' | 5.80 | 1.14 | .30 |
| 88 | 5' | 11.18 | 1.42 | .16 |
| 89 | 4' | 4.16 | .87 | .25 |
| 90 | 4' | 14.32 | 2.10 | .18 |
| 91 | 4' | 7.42 | 1.22 | .30 |
| 92 | 4' | 1.96 | .30 | .04 |
| 93 | 5' | .96 | .26 | .02 |
| 94 | 2' | 4.60 | .82 | .17 |
| 96 | 9½' | 20.06 | 1.82 | .12 |
| 96 | 5' | 5.58 | .64 | .14 |
| 97 | 8½' | 3.56 | .84 | .28 |
| 98 | 9½' | 6.42 | .82 | .08 |
| 99 | 2' | 8.08 | .80 | .16 |
| 100 | 1½' | 5.80 | .86 | .14 |
| 101 | 7' | 5.48 | .89 | .17 |
| 102 | 5' | 2.06 | .76 | .04 |
| 103 | 5'25' | 1.86 | .34 | .10 |
| 104 | 1½' | 2.96 | .46 | .06 |
| 105 | 1½' | 1.28 | .20 | .35 |
| 106 | 0.9' | 13.78 | 1.90 | .66 |
| 107 | | .36 | TR. | .02 |
| 108 | 3' | .34 | TR. | .01 |
| 109 | 2' | .20 | TR. | TR. |
| 110 | 2½' | 22.88 | 3.56 | .09 |
| 111 | 2½' | 1.78 | .10 | .04 |
| 112 | 1' | .37 | .18 | .02 |
| 113 | 5' | TR. | TR. | TR. |
| 114 | 4' | .48 | .10 | .01 |
| 115 | 1' | .36 | TR. | .01 |
| 116 | 2' | NIL. | TR. | TR. |
| 117 | 3' | TR. | TR. | TR. |
| 118 | 4' | NIL. | TR. | TR. |
| 119 | 5' | TR. | TR. | TR. |
| 120 | 3' | .67 | .10 | .01 |
| 121 | 3' | .30 | TR. | TR. |
| 122 | 4' | 3.77 | .62 | .14 |
| 123 | 2' | 2.19 | .40 | .12 |
| 124 | 4' | 1.60 | .30 | .04 |
| 125 | 3½' | 1.72 | .10 | .04 |
| 126 | 4' | 7.36 | 1.66 | .20 |
| 127 | 4' | 1.64 | .40 | .08 |
| 128 | 4' | NIL. | TR. | TR. |



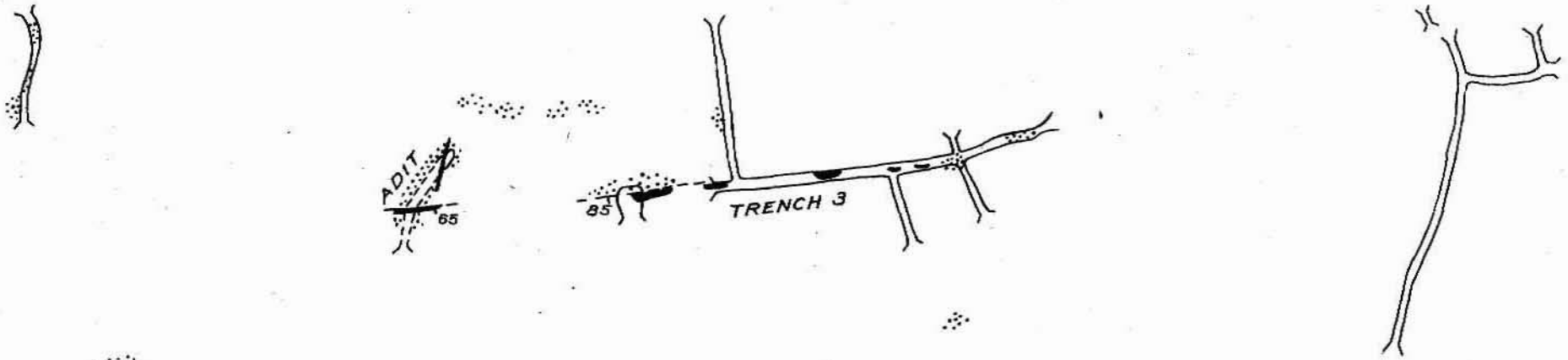

Location of samples from stope map by Solar Development Co.
Published by permission of Consolidated mining and Smelting of Canada Ltd

SECTION ON VEIN OF THE RUSH AND BROWN MINE
KASAAN PENINSULA, PRINCE OF WALES ISLAND, SOUTHEASTERN ALASKA

50 0 100 Feet

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

FIGURE 8




Cabin

50 0 150 Feet

29½°
TRUE NORTH
MAGNETIC NORTH

Alluvium and glacial drift
Sulfide ore
Greenstone

Trench
Opencut
65
Footwall of vein showing dip

Geology by R.G. Ray and S.P. Brown 1943

# GEOLOGIC MAP OF IRON CREEK No. 1 (VENUS) CLAIM
# KASAAN PENINSULA, PRINCE OF WALES ISLAND, SOUTHEASTERN ALASKA

6787