

HIN/13SW-0014

LOAD: 16 mm
COMBO

495
500

R E V I E W
OF
BURRAGE COPPER MINES
MICHIPICOTEN ISLAND
THUNDER BAY, ONTARIO

BY
R. MASSEY WILLIAMS
JULY 17TH., 1948

R E P O R T

BY
W. S. DYER, CHIEF FIELD ENGINEER

JUNE 29TH., 1938

*See Also
Geology of
Michipicoten Id
by
E. M. Burwash
U. of T Studies
No 3. 1905*

RECEIVED
AUG 11 1948

RESIDENT GEOLOGIST
LAKE ST. MARIE

100-1-1000

BURRAGE COPPER CLAIMS

Michipicoten Island, Thunder Bay, Ontario.

PRESENTED:

By M. J. Galvin on July 15, 1948, 7 Darkmouth Cres., Mimico, Ontario. (Telephone in Toronto, c/o Elgin 2173).

PROPOSED TERMS:

Mr. Galvin has a short term option from the Burrage estate and makes the following proposal:

A 30 day option for \$1,000. cash, and a 75% interest in the group for \$25,000., with option on the remaining 25% to net him some \$25,000 over a period of five years.

Summary
\$51,000. for 100% interest in the property, and Mr. Galvin would want to be employed during this five year period.

DATE PRESENTED:

1. An admiralty chart (photostat copy) of Island.
2. A report on a corner deposit, Michipicoten Island by the late W. S. Dyer, dated June 29th., 1938. (Mr. Dyer was employed by O'Brien interests.)

PROPERTY & LOCATION

The property comprises some 6,560 acres on the extreme west end of Michipicoten Island and is owned by the A. C. Burrage estate of Boston, Mass.

STATUS OF PROPERTY:

Although not advised, it is judged by the Dyer report that a considerable sum of money is probably due on back taxes.

TIMBER:

The estate is reported by Mr. Galvin to own the timber rights, which are a good stand and comprise 55% maple, 27% evergreens and 18% scrubs.

GEOLOGY & OTHER INFORMATION:

The Dyer report is included as the last information available and covers the situation.

CONCLUSIONS:

The terms offered are not in proportion to the indications and same therefore cannot be considered.

TORONTO, July 17th., 1948.
Attached: Copy of Dyer report
Photostat of Island

R. Massey Williams

RECEIVED
PRESIDENT
OF THE
COUNCIL

REPORT ON A COPPER DEPOSIT

MICHIPICOTEN ISLAND

INTRODUCTION:

Prof. G. H. Mickle, Mines Assessor for the Province of Ontario, first drew our attention to the Copper occurrences on Michipicoten Island, and to the fact that there are two large "locations" on this island, one of which includes the copper deposits, which were granted many years ago and which are in arrears in taxes, and for this reason could probably be acquired at reasonable prices. We were able to obtain a copy of the "Report of the Royal Commission on Mineral Resources of Ontario (1890)" in which these occurrences are described, and we have already (April 9th and 10th., 1931) submitted excerpts from this report along with other details.

The copper occurrences are included in the "Charles Jones" location, consisting of 6,563 acres at the west end of the Island. Taxes on this location were last paid in 1931 by the estate of A. C. Burrage, 85 Ames Building, Boston, Mass.; the arrears now amount to approximately 2,000. The "Bonner" location, near the middle of the Island, consisting of 6,400 acres, is not so interesting as the "Jones" location, although occurrences of nickel and silver were reported from it, and there is perhaps more good timber on it than on the "Jones" location. The arrears of taxes on the "Bonner" location as advertised in the "Ontario Gazette" amount to 14,787.42; taxes were last paid by Samuel George Stone of Sault Ste. Marie, Ontario. Attempts were made to get in touch with the A.C. Burrage estate for the purpose of learning the terms on which the "Charles Jones" location could be acquired. Finally a letter dated May 19th. was received from Albert C. Burrage of the J. S. Packard Dredging Co., who is probably the son of the original owner, stating as follows: "In answer to your letter of the 5th., of May, we still have the property. Please advise what your offer for it would be."

GENERAL DESCRIPTION OF MICHIPICOTEN ISLAND:

Before negotiating further with Mr. Burrage it was considered advisable to visit the Island to check up on the statements contained in the old report of 1890. Accordingly a trip was made by the writer, starting June 9th. and returning June 21st. A 20' open boat was used, and several days were lost waiting for good weather, but nevertheless this seemed the best way to make the trip, as any point on the Island could be visited for any desired length of time. As a matter of fact, we were able to draw the boat up on shore at the old copper mine and spend three days on a detailed examination. There is regular steamship service to the fishery in Quebec Harbour on the south side of the Island, boats calling Monday and Friday each week. However, the old mine is on the northwest side of the Island, six miles in a straight line from the harbour, and although there was a road between these points in the old days, it is now overgrown. There is no protection for boats at the old mine, nor anywhere along the north shore of the Island. If preliminary

development work, e.g. diamond drilling, were undertaken, equipment and supplies could be shipped by steamer to the harbour and on good days during the summer months could be taken in small boats around the Island to the old mine and landed there. In case of large scale development, the old road from the harbour to the mine would have to be repaired. It is fairly safe to assume that the road bed was of good construction, since very heavy equipment was at one time taken over it.

The population of the Island consists of only the light-house keepers and men employed at the fishery at Quebec Harbour. The fishery is a modern plant with equipment for the manufacture and crushing of ice, etc. Two large modern tugs are employed. The harbour is an excellent one and is well protected by lights. Navigation is open always from May 1st. to December 1st, and sometimes longer. In the winter the lake freezes over some distance from shore, and although navigation could be extended by the use of ice breakers, it would probably be advisable to use aeroplanes during the winter in any continuous operation.

The Island is well timbered. Along the shore the timber consists of birch, spruce, poplar and mountain ash. The middle part of the Island, however, is largely covered by hard sugar maple with 12" to 14" butts, which are reported to be in good condition. The boundary of the maple forests is shown on the map accompanying this report. This boundary was indicated to the writer by H. Bazelot who accompanied me on the trip and who has lived for two years on the Island. The hardwood forests should be valuable and rights to them are vested on the "locations" mentioned above.

GEOLOGY:

The geology, and consequently the land forms of the Island, differ very markedly from the north shore of the lake, but resemble that of the Head of the Lakes - Port Arthur and Fort William. Rock formations are chiefly volcanics of the Keewenawan period (late pre-Cambrian) and are much fresher than the Keewatin-Temiskaming complex; types noted were columnar basalt of varying texture and amygdaloidal trap, rhyolitic quartz porphyry, etc.; some sediments such as conglomerate and sandstone are also present. The rock formations appear conformable and are gently folded with low dips. In general the rocks strike east and west, coinciding roughly with the long axis of the Island, but in places the strike swings to the northeast. Dips on the southern part of the Island are 10 to 15 degrees to the south, but along the northern side of the Island are steeper than this - 30 to 60 degrees; in the vicinity of the copper they are usually 50 degrees. It is noticeable that all hills have gentle slopes to the south (down the dip) but abrupt faces with talus slopes to the north. There are some large hills on the northeastern part of the Island, one of them rising 800 feet above the level of the lake, or 1,400 ft. above sea level. The topography is rugged also on the west part of the Island, but the elevations are not so great. Veins of calcite and calcite and quartz mixed occur rather frequently, and are of the low temperature type, being very distinctly banded. Agates are quite abundant in some places.

DESCRIPTION OF THE OLD COPPER MINE:

At the old copper mine the rocks strike northeast to east-northeast and dip 50 degrees to the southeast. They consist principally of dark, soft trap which is often amygdaloidal. Columnar basalts are present also which differ considerably from the trap, being harder and more brittle. In the old report it is stated that the ore consists of amygdaloidal trap showing quartz, calcite, epidote, pyrite and native copper, the latter occurring in masses from 40 to 50 lbs. to minute particles of very fine shot and leaf copper. No native copper, however, was seen by us on this trip. It is possible that the native copper has weathered out and been oxidized in the material now seen on the dumps, or it is possible that the ore has been concentrated and the concentrates shipped, in spite of the fact that J. S. Williams (1890), who was superintendent of the mine for a short period, states that, although a considerable portion of ore was taken out, no portion of it was dressed and none shipped, and still lies on the dump. The fact remains that there was a mill which must have been used, since tailings were found by us in the old jigs. It is, therefore, natural to assume that some concentration was done.

Green stains of malachite were found in some material on various dumps, but the best evidence of copper was found in a small "pile" near the waste dump at the northeastern shaft (marked 5 on the sketch). Here the material is heavily charged with chalcocite, with smaller amounts of bornite and chalcopyrite and coated with green malachite. Two pieces of this material assayed 5.95% and 2.22% copper. No figures are given for the percentages of copper in this part of the property, but widths are stated to have been from 3 to 6 ft. The old report (1890) states that the ore is pretty regular as to size but varies very considerably as to productiveness - in some places poor and in others well charged with copper.

No figures are given for the length of ore, but the distance from the most northeasterly to the most southwesterly shaft along the strike is 2,000 ft., and Cozens (1890) speaks of early work being done at the eastern end of the location where heavy copper was found in several shallow shafts. This point is one mile northeast of the old mine; old buildings and trenches were found there by us.

Much work, which must have cost a great deal of money (at least \$440,000, according to Cozens), was done as evidenced by the remains of buildings and machinery on the old property. This is shown in the sketch accompanying this report. There are several large buildings, a steam power plant with two turbines 16 ft. in diameter, and old mill with a good sized crusher, jugs, etc., etc. Men must have lived for several here as the property is laid out in roads and walks, apple trees have been planted, and the gentle slopes from the lake shore to the high cliffs are in grass. To the southwest of the old mine there is an old farm with fields planted in clover, and an old two-wheel cart is still there where it must have stood for fifty years. There does not seem much doubt that valuable copper deposits must have been present. Why work was stopped is not known.

Probably the most important copper occurrence on the Island is that described by Cozens (1890) as a conglomeratic loam which he

found one mile southwest of the old mine. Statements made by him concerning this occurrence are as follows: "This lode is from 6' to 8' in width with an amygdaloidal lining and sandstone foot wall and has a pay streak of over 2 ft. averaging from 1 to 5% of native copper. On this I have sunk a shaft about 65 ft. deep and have tested to the depth of over 200 ft. with diamond drill. At this depth the whole of the lode carries heavy copper. I had about eight men employed and anticipate working a very much stronger force next year". Later (1894) he notes: "Surface work on the conglomerate lode.....had indicated a length of mineralized conglomerate of 4,000 ft. and the width of 20 ft. as mentioned." Evidence of this work can still be seen. One mile southwest of the old property trenches extend for one mile southwesterly along the shore and remains of old buildings can still be seen. Some pieces of conglomerate were found but these did not carry copper. It would not take long for a small crew of men to dig out the trenches to expose the copper ore. Judging by the general accuracy of Cozens' report in other particulars, it would seem that his statements regarding conglomerate lode could also be depended upon.

CONCLUSIONS:

Although little actual copper ore could be seen, since the trenches are filled in and shafts are flooded with water, it would nevertheless appear probable that a valuable copper deposit exists on this property. This conclusion is based chiefly on the fact that so much expensive work was once done, and also on the fact that in most particulars the reports of Cozens and Williams are accurate, and, hence, it would appear likely that their statements with regard to the ore bodies are accurate also. Any property is a good prospect which has on it any likelihood of a copper lode with lengths, let us say, of from 3,000 to 6,000 ft. with widths of from 3 to 8 ft., and with a considerable portion of it grading 1 to 5% copper. The possibilities with regard to the merchantable timber should also be taken into consideration, and the large size of the "location" which is all patented ground requiring no assessment work.

We have the information that the old location had been in arrears for taxes for several years and is owned by an estate. It would seem probable that the property could be acquired at a very reasonable figure. It is possible that it could be acquired as an outright purchase at a price of, let us say, \$10,000, which would include payment of taxes. It would, however, appear to be more advisable to obtain an option on the property with a free period of examination. I would suggest a total price of \$50,000. for 100% interest, the total sum payable over three years, a free period of examination of two months, and an initial payment at the end of two months of \$1,000, other details to be arranged later. If we were to obtain a free period for examination I would suggest that another visit be made to the property with a small crew of men who could do some stripping and who could do some dipping in the old dumps for evidence of native copper, after which further development, particularly diamond drilling, could be considered.

It might be added that it has been difficult to keep the purpose of our visit to the Island from the general public. It is

possible that someone now has learned our purpose, and I would, therefore, recommend that negotiations be opened as soon as possible with Mr. Burrage of Boston. It also seems advisable that these negotiations be started and carried on by some third party.

NOT TO BE REPRODUCED

THE SECRET

CLEAR

CONFIDENTIAL

TORONTO, June 29th., 1933.

W. S. Dyer,

Chief Field Engineer.

30 Nov.1939

DESCRIPTION OF "THE MICHIPICOTEN COPPER PROPERTY"

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AREA OF PROPERTY: Is (as above stated) about ⁶⁵⁶³6600 (six thousand six hundred) acres, consisting of the "Jones Location" of about 6400 acres being the entire West end of the Island of which but a small portion has been explored and the "Harbour Location" of about 200 acres situated at Quebec Harbour.

The lodes or beds are on the "Jones Location" on the North shore of the Island outcropping on or near the shore as per enclosed plan. These lodes run North 35° East and dip to the South East toward and into the Island at a varying angle of from 40° to 50° the outcrops of the two outer beds are under water, but show their metallic contents distinctly even at a depth of eight (8) or ten (10) feet through the clear water of the Lake. Nos. 1 and 2 are amygdaloids from eight (8) to twelve (12) feet in width each and No.3 a conglomerate about thirty (30) feet wide. In addition to these a conglomerate lode No.4 occurs about a mile to the westward, running on a slightly different course and being in an upper zone. This lode has an amygdaloid hanging wall and a sandstone footwall and stands up like a wall through the surrounding country. It can be readily traced on the outcrop for at least two (2) miles and is from eight (8) to ten (10) feet wide.

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EXPLORATION AND DEVELOPMENTS

No.1 Lode The "Office Shaft" was sunk on this lode, it was examined and reported on by the late Charles Robb, M. E. of Montreal, as follows:-

"Next the hanging wall which is well defined is a band of greenish-gray and purple amygdaloid trap, six (6) or eight (8) inch in thickness, containing native copper in coarse grains and small masses. Underlying this is a band of purple sandstone averaging two (2) feet six(6) inches in thickness impregnated with native copper in minute grains and threads. Succeeding this is a soft argillaceous bed, sometimes slightly amygdaloidal, five (5) feet in thickness, also containing native copper disseminated in particles and occasional small masses. My estimate of the whole thickness of this metaliferous course of rocks is 2 1/2% (two and a half per cent). About 1700 to the eastward the "Beaver shaft" has been sunk, in this the metaliferous quality of the lode is fully maintained and in some places greatly exceeded."

No.2 Lode On this what is known as the "Main Shaft" has been sunk but although the developments have been comparatively extensive, only some few hundred feet are on the lode itself. The "Main Shaft" is sunk to a perpendicular depth of two hundred (200) feet, where it intersects the lode, at this point No.2 level was driven east and west; the shaft was then continued on the dip of the lode and at about 90 (ninety) feet No.3 level was driven;- a short distance below the shaft got off the lode but was continued to a depth of 320 feet from No.2 level, where a short cross cut shows the lode again. No.4

level was driven a short distance ~~but~~ does not touch the lode proper, it is now used as a sump, by this, the mine being a comparatively dry one it is only necessary to pump occasionally. Through the whole depth of this shaft (520) feet only about one hundred (100) feet are on the lode itself, but nearly the whole of this passed through good ground containing both barrel and shot copper. No.2 level passed through chutes of good ground both east and west and on No.3 level the extent and richness of the copper ground increased materially.

Below is given a report from Capt. Williams of the "Sultana Mine", this report shows that from the bottom of the winze to the surface it is reasonable to expect a large block of good stoping ground which could be worked out at once, thus providing funds for deeper work.

Copy of letter from Capt. Williams, Sultana Mine

Joseph Cozens, Esq.,

Dear Sir:

In reply to your enquiries about the native copper property on Michipicoten Island, I would say that I had charge of the mine for about ten (10) months, during the last working, in fact until the closing of the work, and I am thoroughly acquainted with it.

The main shaft entered a run of copper bearing ground where it intersected a lode at No.2 level (200 feet). This continued on the shaft to a little below No.2 level, where the lode was left in the footwall and the shaft sunk

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GEOLOGIST ONT. DEPT.
OF MINES
BAULT STE. N.

entirely off it. Nos. 2 and 3 levels were extended, the course of the lode opening up good ground ~~and~~ nearly the whole length and showing a marked improvement in the lower level. A winze sunk from the bottom of No.3 level about three hundred feet west from the shaft showed good copper for the whole depth of 50 feet, in some places running as much as 3-1/2% (three and a half per cent) in copper for full size of winze. Both here and in the shafts and levels, masses of copper appear ranging from one to twenty pounds in weight, besides a large amount of both coarse and fine copper.

From a little below No.3 to No.5 or bottom of the mine, the shaft is not on the lode, but over it. At No.5 where the lode is again entered its appearance is very promising.

The conglomerate belt underlying the amygdaloid is a very interesting point, as it can easily be proved by a crosscut at "Main Shaft" at a comparatively small expense; should it only contain low grade copper as from surface indications, it would certainly appear to, it would pay well.

At the "New Mine" there was a shaft sunk to the depth of about fifty (50) feet on another conglomerate belt about eight (8) feet wide. We had a very fine showing of copper with a marked improvement in depth. Along this bed for about two (2) miles good pieces of copper are found on the surface. Judging from the general character of the lode, there is every reason to think it will be uniformly productive and profitable when developed. I know of no property that shows fairer prospects of success.

I am, dear Sir,

Yours faithfully,

(signed) F. G. S. Williams

No.3 Lode

Has not yet been explored, but boulders from it found on the shore are rich in copper.

"Bathers Shaft" has been sunk to a perpendicular depth of three hundred and sixty (360) feet. From 360 feet a cross cut has been driven towards "Main Shaft". There is now only about seventeen feet to drive to make the connection which when made will ensure perfect ventilation for all future workings.

"Conglomerate Lode No.4"

On this a shaft has been sunk about fifty (50) feet and on the surface several cross cuts were made all of which showed strong copper. At the outcrop the copper occurred in the amygdaloid hanging wall, but on sinking it came in the conglomerate, increasing rapidly in width and richness as depth was attained. At about 30 feet it showed a streak of about two (2) feet carrying 4 to 5% copper; since then it has varied in width and richness and there is now a good showing of copper in the bottom of the shaft. The analyses made from time to time vary greatly in amount of copper shown, but I believe a conservative estimate for the average of the contents of the four lodes would be two per cent (2%).

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THE OFFICE OF THE RESIDENT
GEOLOGICAL SURVEY DEPT. OF
MINES

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 1
 SHEET NUMBER _____
 SECTION FROM _____ TO _____

DIAMOND DRILL RECORD

LOCATION: LAT. 200' S. Main Shaft. 50' E. Main Shaft
 DEP. _____
 ELEVATION OF COLLAR _____
 DATUM _____
 DIRECTION AT START: BEARING N 47° 07' W
 DIP -70°

STARTED June 30, 1942
 COMPLETED July 3, 1942
 ULTIMATE DEPTH 358.8
 PROPOSED DEPTH _____

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	1 Cu
0.0 - 6.8	Casing, mostly ophite, a little carb. at collar with speck Cu					
22.0	Ophite, fine to medium grained, scattered 1/8" amygd's occas. thread FeO at 15° to hole 0.1' carb at 18.2'					
23.5	Ophite med. gr. well veined with FeO, a little carb and specs of Cu	7901				0.04
32.5	Ophite, med. gr. Very occas. amygd. threads, FeO at 70° to hole					
36.7	Ophite, consid. FeO and Carb. veining strong 2" carb. at 33.8' with fine Cu	02				0.05
39.5	Ophite, highly altered with consid. FeO and Carb	03				0.05
75.5	Ophite, med. gr. 1/8" carb at 90° at 43'. 1/8" chlorite Slip at 60° at 63.5'. Weak FeO threads with fine specs Cu at 74.75					
76.3	Ophite, massive, med. gr. specs Cu at 75.5 and FeO thread plus Cu 75.9' - 76.2'	04				0.065 metallic Cu
98.6	Ophite, massive, med gr mottling very scattered FeO, slightly reddish with scattered amygd's 95.0' - 98.6'					
101.0	Ophite, highly altered, white, red carb. chlorite, FeO, weak specs Cu	05				0.025
150.0	Ophite, med. gr. 1/8" carb FeO and specs Cu at 107.8 0.1' carb at 90° at 137.5 with pin points Cu. Mottling very uniform					

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 JUL 1942
 RESIDENT GEOLOGIST
 EARLY ST. MARIE

PROPERTY

HOLE NUMBER 1 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

 LOCATION: LAT.....
 DEP.....
 ELEVATION OF COLLAR
 DATUM
 STARTED
 COMPLETED
 ULTIMATE DEPTH
 PROPOSED DEPTH
 DIRECTION AT START: BEARING
 DIP

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
294.0- 296.8	Cse, red amygdaloid, consid. carb replacing amygd	7910				0.025
311.0	Amyd. with red color disappearing about 306'					
	Amygs mostly white (carb) to 299.0 then red to 306. Begins to take on mottled appearance of ophite before amygd. disappear					
325.0	Amyg. with ophite mottling med. to cse. 0.5' carb and chlorite alt. zone at 65° to hole					
339.0	Ophite, med to cse, dk. green, carb and chlor. zone 0.1' at 332.5					
340.8	Ophite, fine gr. scattered amyg slight reddish color					
341.5	Red amygdaloid, fine to med. amygs, mostly green, ground mass red					
343.4	Cse red amyg occas. spec Cu, white carb. amygs	11				0.04
348.0	Well mineralized, or alt. zone. Red gr. mass soaked with carb and little qtz and FeO	12				0.06
358.8	Amygd, fine red, getting green toward end at 358' Amygs plentiful (Broke into old mine workings) Dip test at 350- 68°					

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 2

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: PAT. 200' S Main Shaft
 DEP. 50' W Main Shaft

STARTED July 1, 1942

COMPLETED July 6, 1942

ELEVATION OF COLLAR

DATUM

ULTIMATE DEPTH 411.0

DIRECTION AT START: BEARING N 49° 57' W
 DIP -41°

PROPOSED DEPTH

405

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD S	SLUDGE GOLD S
0.0 - 7.0	Casing				
31.5	Ophite, massive, med to cse. 0.05 chlor. and carb at 90° to hole at 22.1'				
35.0	Ophite, med to fine gr textural variation from typical, weak red tint				
41.8	Ophite, med to cse gr. very weak red tint, carb and chlor 0.1' at 90° showing fine Cu				
57.0	Ophite med. to cse, red tint. Carb. zones 0.4' at 43.1' at 90°, 0.1 at 44.4 at 90°, 0.5 at 90° at 45.5'				
69.2	Ophite, med to cse, greenish tint, massive, 0.02 carb at 66.9, small spec Cu., Chlor and carb at 68.7 at 90° Very fine specs Cu				
72.0	Ophite, massive, med to cse gr., irregular bands of carb thru zone, no visible Cu				
103.7	Ophite massive, med to cse gr, thread FeO at 77.6 at 65° to hole 0.1 carb at 79.4 at 90° 0.2 carb and chlor at 80.2 at 90°, 0.05 carb and chlorite at 92.2 at 90°, 0.2 chlor and carb at 100.1 at 90°				
169.0	Ophite, cse, mottled, scattered chlor joint planes, all angles, best at 15°, 2" carb and chlor at 104.5 at 80°, 1" red carb with specs Cu at 122.5 at 55°; 1" chl. epidote and white carb with scattered pin pts Cu at 122' at 70° 1/2" carb, chl and spec Cu at 136 at 80°, 1/2" white carb, chl. spec Cu at 137.3 at 85°; 1/2" chl. slip well schisted at 145' at 20°				
169.5	Ophite, fine gr broken Ophite, fine to med gr. slightly reddish				

PROPERTY

HOLE NUMBER 2 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT.
 DEP.
 ELEVATION OF COLLAR
 DATUM

STARTED

COMPLETED

ULTIMATE DEPTH

DIRECTION AT START: GEARING
 DIP

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD g	SLUDGE GOLD g	% Cu
169.5-181.6	Small white amygdules at 171'-171-7' 1" red carb with pin pts Cu at 171.4 at 75°					
185.6	Ophite, jointed and broken with scattered fine specs Cu	7913				0.045 fine Cu
188.0	Ophite, fine to med gr. slightly reddish Carb and chl. stk. parallel to hole at 179.6 to 181.0 with fine specs Cu. Chl. carb and Cu specs 181.7-182.0 at 60°. Carb and chl veining at 187' at 188' at 80°					
234.0	Ophite, med. gr. slightly reddish, occas. chl joint. Few specs Cu at 208.5-209' 0.1' carb and chl at 218.5' at 90°. 0.1' carb and chl at 219.3 at 90°; ½" carb slip at 228.3 at 40° ½" carb at 231.2 at 70°, fine pin pts Cu					
243	Ophite, fine gr ½ carb at 240' at 20' to hole					
245.5	Amygdaloid, reddish tint, with pale pink to white amygdules	14				0.075
251.7	Amyg. cse gr. green amygs with reddish gr. mass					
256	Lost core					
264.5	Amyg. med to fine gr, amygs varying white to red and green in red g. mass					
271.2	Ophite trap-like, gradational from above and below reddish g.m. fine gr., occas amygdule. ½" carb at 267.8, 269.8, 270.1, 271.2 at 90°					
274.0	Ophite, trap-like, more intense red, 1/8" green amygs					
276.1	Ophite, trap-like fine gr. reddish, no amygs ½" carb at 275.7 at 70°					
285.2	Ophite, trap-like, ophitic texture not clear slight reddish tint. Chl slip at 10° at 284.0 Chl slip at 277.5' at 30° to hole					

PROPERTY

HOLE NUMBER 2 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM 10 TO 25

LOCATION: LAT.....
DEP.....

STARTED

ELEVATION OF COLLAR

COMPLETED

DATUM

ULTIMATE DEPTH

DIRECTION AT START: BEARING
DIP

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE No	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
285.2-286.3	Amygdaloid, reddish g.m. large amygds flaky disseminated Cu	7915				0.10
291.4	Amyg. red g.m. large 1" white amygds small spec Cu at 291.3'					
295.6	Amyg. g.m. becomes darker, not many amygds, considerable carb in zone, no visible Cu					
296.7	Carb zone, green to white, finely disem. Cu	16				0.09
298.7	Amyg. fine gr. reddish g.m. 1/8" pink to gr amygds, Carb spots present.					Fine Cu
300.8	Amyg, red tint, fine gr 1/8" green amygds					
311.5	Ophite, trap-like, med and fine gr, a few green amygds. 0.1' carb at 302.4' at 90°, 1/2" carb at 305.2; 1/4" chl slip at 305.5 at 40°					
326.5	Ophite, slightly red, mottling regular and larger than above, dense and trap-like, 1/2" carb at 313.8 at 90°, Chl slip at 315.5, 0.1 carb and chl at 322.7 at 90°, 1/2" carb and chl at 323.6 at 90°, 0.3' carb at 326.5					
347.5	Ophite, trap-like, cse gr. 0.1 carb at 332.7 at 90°, frequent chl slips but no cu showing, average 45° to hole, FeO veinlets at 345.0'					
348.2	Carb zone with large amygds Finely disseminated Cu 0.1' chill zone at 348.0 Cu does not cross this zone.					
348.9	Slaty material, dense, fine, reddish to purple, good bedding planes, has fine specs Cu	17				0.15
352	Contact of slate and conglomerate at 50° at 349.1. Carb and chl slip, No Cu showing. Congl fine gr, reddish g.m. light coloured pebbles and fragments. Fragments and pebbles are small angular and round. Scattered fine Cu					

PROPERTY

HOLE NUMBER 2 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM 10 TO

 LOCATION: LAT.
 DEP.
 ELEVATION OF COLLAR
 DATUM

 STARTED
 COMPLETED
 ULTIMATE DEPTH
 PROPOSED DEPTH

 DIRECTION AT START: BEARING
 DIP 41°

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
352-357	Congl. continuation, Sampled No vis. Cu	7919				0.025
380.9	Amyg. boulder, 1.0' at 368.0' Congl med.gr. in some places angular particles are more numerous than rounded ones					
387.7	Congl. fine gr. red colour, occas amyg and slate					
387.80.1	slate impacted clay-like layer at 387.4 at 90°					
394.0	Congl. cse gr. good pebbly structure, no vis Cu					
395.1	Amygdaloid, very fine gr. no vis Cu					
402.9	Congl. med to cse. well defined, some large 7" boulders					
403.5	Slate, reddish bedded sediment, quite hard, no Cu showing					
406.5	Congl. reddish to green ground mass occas. white amyge					
408.0	Reddish fine gr banded sed, possibly sandstone					
411.0	Congl? fine gr, red g.m. occas amyg boulder					
	Dip test at 300 - 45° 30'					

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 3

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM 10 TO

LOCATION: LAT. 200 S. Main Shaft
 DEP. 100 E. Main Shaft

STARTED July 4, 1942

ELEVATION OF COLLAR

COMPLETED July 9, 1942

DATUM

ULTIMATE DEPTH 488.8

DIRECTION AT START: BEARING N. 65° 39' W
 DIP -70° 45' - 67°

PROPOSED DEPTH

CM-MS

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
0 - 6.0	Casing				
16.0	Ophite, fine gr. reddish tint, occas amyg. spec Cu at 7.6', 1/8" carb str at 10° hole at 14.0'				
29.4	Ophite, med. gr. reddish tint, FeO str at 30° at 19.5. occas 1/2" amyg.				
31.5	Ophite, med. gr. massive, strong carb zone, many stringers				
50.1	Ophite, massive med gr. occas amyg 0.1' carb at 32.9 at 40° to hole; 1/2" carb str at 34.1 at 90° to hole. Carb zone 37.2-37.7 at 30° to hole				
51.1	Lost core				
66.0	Ophite, massive, med. to cse gr. slight red tint. 0.1' carb. at 61.9' at 20°, 1/2" chl. slip at 10° at 65'				
70.0	Ophite, med to cse, red tint, 0.1' carb str. at 66.8 at 30° to hole				
74.3	Ophite. Massive, med to cse gr. slight reddish tint. 0.2 carb and chl at 90° at 71.7				
79.6	Ophite, dark massive, med to cse, no red tint, small spec Cu at 77.4'				
80.6	Ophite, med to cse, reddish tint predominant At 78.7 carb, 0.1' carrying flake Cu. Small spec Cu at 80.1'				
82.5	Ophite, med. gr. red tint, 0.3' carb and amyg band at 90° at 82.5				
91.3	Ophite, massive, dark med gr, regular mottling				
92.3	Lost core				
94.0	Broken core, ophite. Many chl slips at all angles				

PROPERTY

HOLE NUMBER 3 cont'd

DIAMOND DRILL RECORD

SHEET NUMBER

SECTION FROM

TO

LOCATION: LAT.
 DEP.
 ELEVATION OF COLLAR
 DATUM

STARTED

COMPLETED

ULTIMATE DEPTH

DIRECTION AT START: BEARING
 DIP

PROPOSED DEPTH

 5
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 S
 M
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 4
 9
 5

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
94.0 - 163	Ophite- med to cse, massive, dark, $\frac{1}{2}$ " carb at 99.8 at 90° with spec Cu, .1' carb at 100.2 at 90°, several specs Cu at 100.5 Ophite showing Cu on chl slips pin pts. Cu in ophite at 114.2, FeO seam $\frac{1}{8}$ " at 147.2' at 60°, $\frac{1}{2}$ " chl slip at 30° at 132.2'					
164	Carb and chl zone fairly well established flake Cu on slip planes, planes being at 55° to hole	7920				0.03 fine Cu
194.2	Ophite, cse gr. good mottling, pin pts Cu at 179.0' 0.2' carb and chl at 182.6 showing pin pts Cu at 190.3 pin points Cu in ophite					
236	Ophite, med to cse, 0.4' carb and chl at 194.3 showing pin pt Cu flake of Cu at 195.3 in ophite. Chl slip at 213.2 at 25°. 0.2 carb and chl at 90° at 215.4' 0.1 carb at 60° at 227.7. 0.1 chl and carb at 45° at 234.9					
239.6	Lost core					
240.2	Ophite, fine gr, massive, poor mottling					
241.8	Chl and carb zone, no vis. Cu					
266.5	Ophite, massive, med to cse gr., reddish tint, several FeO threads at approx 45° at 246.5, 247.0, 248.2. Chl slip at 90° at 256.1, fine pin pts of Cu. Pin pts Cu in ophite at 250.4. Chl slip at 90° at 260.9, pin pts Cu showing					
296.6	Ophite, fine gr. reddish tint, mottling not too apparent.					
306.6	Amygdaloid, br to red g.m. $\frac{1}{2}$ " white and pink amygs					

PROPERTY

HOLE NUMBER 3 cont'd

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT.....
DEP.....

ELEVATION OF COLLAR

DATUM

DIRECTION AT START: BEARING
DIP

STARTED

COMPLETED

ULTIMATE DEPTH

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
306.6 - 356	Amygdaloid, fine gr, reddish to gr tint, 1/8" green amys. No white or pink amys. Chl. skip at 312.4 at 60°. Carb at 312.7 at 45°, 0.2 carb and chl at 329.7 at 45°, small spec Cu at 340.7					
358.5	Amyg. red g.m., small white amys, no vis Cu	7921				0.025
381.3	Ophite, fine to med, occas amyg, few spec Cu at 366.4					fine Cu
389.2	Congl., fine gr. few amys, No Cu showing					
393.5	Amyg. fine gr, 1/8" green amys, reddish to green g.m.					
396.5	Amyg. gr. tinge, specs Cu over 3 feet	22				trace
405.2	Amyg. fine gr. reddish g.m. 1/2" white amys					
408.4	S.S.? Amyg fine gr. well banded with few amys					
412.0	S.S.? Amyg fine gr. well banded no amys	23				0.02
417.0	S.S. fine gr well banded, no amys					
423.2	S.S. fine gr. banded, occas amys					
440.6	Amyg. fine gr, reddish to brown g.m. 1/2" white amys, which decrease in no. but increase in size, gradational to 432.5					
446.5	Ophite, med to fine gr, dense trap-like, chl slip at 442.8 at 40° to hole					
448.0	Carb and chl zone in med gr congl.					
451.7	Congl. med gr. reddish tint, no vis Cu					
457.0	Ophite, gradational from congl.					
465.2	Amygdaloid, dense, fine gr. 1/8" amys					
488.8	Congl, fine gr occas amyg, red to brown g.m.					
Dip test at 450- 67° 00'						

RECEIVED
JUL 1958RESIDENT GEOLOGIST
GAILT STE. NAME

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 4

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT. 100 W
DEP.

ELEVATION OF COLLAR

DATUM

DIRECTION AT START: BEARING N 48° 15' W
DIP -47°

STARTED July 7, 1942

COMPLETED July 9, 1942

ULTIMATE DEPTH 300

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
0.0 - 12.0	Casing					
137.1	Ophite massive, med to cse, good mottling. Specs Cu at 30, 32.3 and 33.8. Chl slip at 38.4 at 40° with spec Cu. 0.1 carb at 90° at 43.4 with spec Cu 0.2 carb and chl at 90° at 45.7, 0.1 carb at 90° at 95.5. Specs of Cu at 63.2 and 66.5. $\frac{1}{2}$ " carb at 68.7 at 20°. 0.1 carb at 83.5 at 90°, $\frac{1}{2}$ " carb and chl slip at 20° at 84.3. FeO stringer at 106.9 at 90°, 0.1 carb at 105.2, spec Cu at 100.6					
154	Amyg gradational from ophite, scattered amygs, fine gr, reddish g.m. 0.1 carb at 137.5 at 90°, 0.1 carb at 141.2 at 90°, 0.3 carb at 153.8 at 90°					
179.3	Ophite, dense, fine gr., occas amyg gradational from amygdaloid, scattered FeO threads					
184.0	Amyg, large white amygs, red g.m. fine disseminated Cu at 179.6, 181.3 and 182.8	7924				0.15
189.8	Amyg, large white amygs, red g.m, no vis Cu	25				fine Cu 0.029 fine Cu
194.5	Amyg, fine gr. dense, gradational into ophite, 0.1 carb at 193.7 at 90°					
232.9	Ophite, med to cse gr. occas amyg, gradational to fine gr at 230', 0.1 carb at 210.6 at 90°					
234.9	Conglomerate, med gr. red to br g.m. fine scattered Cu	26				0.25
300	Congl. med gr. red g.m. 6" boulder at 277, congl becomes coarse from 277-300. Amyg boulders (10") at 287.4, 291.4, 298.2					
	Dip test at 300' - 47°					

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 5

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT. 200 S Main Shaft
DEP. 100 E Main Shaft

STARTED July 9, 1942

ELEVATION OF COLLAR

COMPLETED July 13, 1942

DATUM

ULTIMATE DEPTH 408.0

DIRECTION AT START: BEARING N 65° 39' W
DIP -37°

PROPOSED DEPTH

5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD
0.0 - 4.0	Casing				
14.6	Fine gr ophite, red tint, occas amyg				
16.6	Lost core				
21.8	Ophite, fine to med gr, red tint diminishing				
22.0	Lost core				
28.8	Ophite, med to cse gr, red tint reappearing, occas irregular FeO thread at 30°				
30.8	Lost core				
33.0	Ophite red tint, med to cse gr				
34.0	Lost core				
38.6	Ophite, med to cse gr, red tint, 0.2 carb at 90° at 35.5				
39.6	Lost core				
183.0	Ophite, med to cse, streaky red tint running thru ophite. Spec Cu at 41.6, chl slip at 50.5 at 50°, 0.1 carb at 61.9 at 90°, 0.1 carb at 74.1 at 90°, 0.1 carb at 84.5 at 60°, scattered specs Cu at 91.9-92.2. Specs Cu at 96.7 in chl slip at 45°, 0.1 carb and chl at 90° at 110.5, at 109 ophite takes on steady red tint, carbonatized zone 118.6-120.6, no vis Cu. 0.4 carb at 127 at 90°, 0.1 carb at 137.3 at 90°, 0.3 chl and carb at 148.6 at 60°, 0.1 carb and chl at 179 at 40°, with pin pts Cu, 1/8" carb at 179.5 at 90° with pin pts Cu				
233.6	Ophite, gradational cse gr from above, regular distinct mottling, pin pts Cu at 223.1, flake Cu at 221.0				
250.3	Ophite, fine gr, gradational from above very dense toward 250, almost trap-like				

PROPERTY

HOLE NUMBER 5 continued

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT.
 DEP.
 ELEVATION OF COLLAR
 DATUM

STARTED
 COMPLETED
 ULTIMATE DEPTH
 PROPOSED DEPTH

DIRECTION AT START: BEARING
 DIP

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	BLUDGE GOLD \$	% Cu
250.3-252.6	Amygdaloid, greenish g.m. pink and white amygd, few specs Cu	7927				0.04
264.8	Amyg. greenish g.m. pink and white amygd.					
286.5	dk reddish g.m. green amygd, occas FeO threads, 0.1 carb at 272.8 at 90°, ½" carb at 279.6 at 90°					
294.4	Ophite, fine gr, dense, trap-like					
299.5	Amyg. red g.m. large white amygd, no vis Cu					
302.7	Amygdaloidal and conglomeratic, at 300.5 bit of carbonatization has taken place, 300.9-301.8 carb zone					
307.5	Amyg. light coloured g.m. green amygd					
316.0	Ophite, med gr. occas amygd, reddish tinge					
337.5	Ophite, med gr, very trap-like, red spotty tinges					
337.9	Slaty material, fine gr. red to brown, very dense-chill zone? fine Cu scattered throughout					
339.2	Congl. med to cse gr, specs Cu showing	28				0.025
359.2	Congl. med to cse, reddish to brown g.m.					
363.0	Congl. med to cse, yellow to orange g.m.					
364.0	Lost core					
377.0	Congl., med to cse, yellow to orange colour, small orange pebbles and fragments					
397.7	Congl. med to cse gr, red to brown g.m. occas amygd.					
408	Congl, med to cse, reddish g.m. frequent amygd, some large (9") boulders					
	Dip test at 400- 36° 30'					

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 6

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT. 200' W
DEP.

STARTED July 10, 1942

ELEVATION OF COLLAR

COMPLETED July 13, 1942

DATUM

ULTIMATE DEPTH 331.0

DIRECTION AT START: BEARING N 49° 49' W
DIP -50

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	1/2 Cu
0.0 - 11.0	Casing					
87.4	Ophite, cse gr, reddish tint flake Cu at 15.5°, chl slip at 40° to hole at 35.1, p'n pts Cu at 55.8, 65.6 and 65.8. FeO thread at 67.7 at 45° 0.3 carb and chl at 90° at 80.2, 0.1 carb at 90° at 87.3					
89.7	Lost core					
98.5	Ophite, med to cse gr., 0.1 carb at 45° at 95.1, 1/4" carb at 90° at 96.0 with specs Cu					
100.1	Lost core					
106.0	Ophite, med to cse gr, flakes Cu at 103.7					
107.7	Lost core					
135.4	Ophite, med to fine gr, 0.1 carb at 90° at 130.8					
138.5	Amygdaloid, med to fine gr, red g.m. small 1/8" amygs, Cu from 135.4-136.2	7929				0.41 Cse Cu
139.5	s.s.? slate? fine gr, banded, fine Cu	30				0.05
145.0	Amyg. red g.m. small white amygs					
164.0	Amyg. green to brown g.m. dark green amygs, 0.1 carb at 155.8 at 90°					
182.1	Ophite, dense dark, fine gr, trap-like, occas dk green or pink amyg, 0.2 carb at 175.3 at 45°					0.63 Cse Cu
184.4	Amyg, red g.m. fine gr, white amygs, Cu showing	31				0.025
189.4	Amyg, red g.m. fine gr, no vis Cu	32				0.075
190.9	Amyg. red g.m. fine gr., no vis Cu	33				
196.1	Amyg, fine gr, small amygs, reddish to green g.m.					
200.5	Amyg. green amyg, fine gr, green g.m. gradational into ophite					
237.5	Ophite, dense, fine gr, trap-like, 0.1 carb at 90° at 201.2, occas amyg					

PROPERTY

HOLE NUMBER 6 cont'd

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT...
 DEP.
 ELEVATION OF COLLAR
 DATUM

STARTED
 COMPLETED
 ULTIMATE DEPTH
 PROPOSED DEPTH

DIRECTION AT START: BEARING
 DIP

5
 4
 3
 2
 1

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
237.5- 275.4	Congl.med to fine gr,reddish brown g.m. 0.1 carb at 90° at 237.6, chl slip at 60° at 237.9 with specs Cu considerable No.amg fragments as well as round pebbles, 6" sections of yellow to orange colour at 257.5, 262, 270.5				
277.0	Congl. very fine gr., reddish-brown g.m.				
308	Congl, many colors,represented by pebbles becomes very cse.at 287 approx,large boulders at 287.5, 292-17" amyg boulder, 295.2-6" amyg, 296.8- 12"				
309.5	S.S. reddish-brown,well banded, fine gr				
311.6	Slaty material,not hard,dense,occas inclusions of rock fragments, carb and FeO in small irregular threads				
331	Hard slaty material,very dense,yellowish colour at first gradational to a dull gray				
	Dip test at 330 - 52° 30'				

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 7

SHEET NUMBER

SECTION FROM

TO

DIAMOND DRILL RECORD

LOCATION: 200E Main Shaft
 LAT. ...
 DEP. ...
 ELEVATION OF COLLAR
 DATUM
 DIRECTION AT START: BEARING N 48° W
 DIP 57°

STARTED July 13, 1942
 COMPLETED July 16, 1942
 ULTIMATE DEPTH 281'
 PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
0.0 - 6.0	Casing					
31.0	Ophite, med to fine, greenish red tint, $\frac{1}{2}$ " carb at 45° at 27.8					
81.7	Ophite, med to cse gr, 0.1 carb at 38.8 at 90° spec Cu at 58.4, 0.2 carb at 65 at 90°, specs of Cu showing, Chl slip at 71.9, flaky Cu	7934				0.192 fine Cu
82.2	Carb and chl at 81.8 at 55° with Cu flakes					
112.7	Ophite, med to cse, 0.1 carb at 97.6 with specs Cu, $\frac{1}{2}$ " carb at 95.6					
113.2	Carb zone, few specs Cu					
167.5	Ophite, massive med to cse gr, 0.1 carb and chl at 90° at 116.6, $\frac{1}{2}$ " carb at 127.5 at 60°, chl slip at 143.3 at 45°, specs Cu, occas FeO thread, 0.1 carb at 90° at 164.9					
168.2	Carb zone with specs Cu	35				0.275 fine Cu
186.3	Ophite, med to fine gr, well mottled, 0.1 carb and chl at 90° at 183.5					
200.8	Amygdaloid, small gr amygs grading to white, no vis Cu microlitic					
201.6	Amyg. red g.m. microlitic cavities					
202.5	Amyg. red g.m. white amygs					
219.5	Ophite, fine gr., occas amyg present, 0.1 carb at 90° at 213.2					
232.3	Ophite, very fine gr, dense, trap-like, very occas amyg.					
234.7	Ophite, fine gr, reddish tint, appears to be slightly altered					
241.0	Ophite, fine gr, dense trap-like, occas irregular FeO thread					
243.2	Amyg. red g.m. large white amygs					
244.5	Amyg, microlitic cavities					

PROPERTY

HOLE NUMBER 7 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT...
 DEP...
 ELEVATION OF COLLAR
 DATUM

STARTED
 COMPLETED
 ULTIMATE DEPTH
 PROPOSED DEPTH

DIRECTION AT START: BEARING
 DIP

SM-495

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLURRY GOLD \$	% Cu
244.5- 247.8	Amyg. red g.m. coarse gr, fine specs Cu	7938				0.025
252.2	Amyg. fine to med gr, reddish green g.m. small 1/8" amygs, no vis Cu					
281.0	Ophite, fine gr, dense, trap-like, gradational from the amyg, quite a few 1/8" green amygs, 0.1 carb at 263.5, specs of white carb from 273 to 281					
	Dip test at 250- 58°					

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 8

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT. 200 W
 DEP.

STARTED July 13, 1942

ELEVATION OF COLLAR
 DATUM

COMPLETED July 19, 1942

DIRECTION AT START: BEARING 90°
 DIP

ULTIMATE DEPTH 480'

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
0 - 8.0	Casing					
56.7	Ophite, cse gr, reddish tint, well mottled chl slip at 30° at 22.1 with specs Cu. $\frac{1}{8}$ " carb at 26.4 at 50°, 0.1 carb at 90° at 37.2 with specs Cu., chl slip at 60° at 49.8 with specs Cu					
58.4	Carbonate zone, Cu specs	7936				0.17 fine Cu
86.0	Ophite, massive, slight red tint, med to cse gr, chl slip at 69.0 at 30° with spec Cu., chl and carb slip at 50° at 76.2 with specs Cu, 0.1 carb at 90° at 78.3, specs Cu showing					
87	Lost core					
146	Ophite, massive, med to cse gr, red tint, 0.2 carb and chl at 101.3 at 45°, $\frac{1}{8}$ " carb at 60° at 102. Chl slips at 112.1, and 112.3 at 50° with specs Cu. Chl slip at 35° at 120.2 with specs Cu. Chl slip at 126.7 at 90° with specs Cu, $\frac{1}{8}$ " carb and chl at 137.7 at 50°					
147	Ophite, strong purple tint, fine gr, looks like a fine amygdaloid					
184.4	Ophite, massive, med to cse gr., reddish tint, FeO and carb at 174.9 at 40°, chl slip at 40° at 181 with specs Cu					
199.4	Ophite, fine gr, red g.m. occas. amyg.					
223.5	Ophite, fine gr., green g.m. well mottled					
226.0	Amyg. fine to med. red g.m. small green and white amygs, some Cu specs	37				0.17 fine Cu
246.0	Amyg. reddish g.m. fine gr, green and white $\frac{1}{8}$ " amygs grading to red to pink amyg, from 237 to 238.5, no vis Cu					

PROPERTY

HOLE NUMBER 8 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT...
DEP.....

STARTED

ELEVATION OF COLLAR

COMPLETED

DATUM

ULTIMATE DEPTH

DIRECTION AT START: BEARING
DIP

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
246.0- 256	Amyg., dense, fine gr., reddish g.m. amygs smaller and fewer, gradational into ophite					
283.7	Ophite, fine gr, dense trap-like, occas.amyg. reddish tint, gradational from amygdaloid. FeO thread at 15° at 268.8, ¼" chl slip at 30° at 273.0					
287.8	Amyg. red g.m. med gr, white amygs, slight 6" chill zone with specs Cu. Spec Cu in amyg at 284.7	7939				0.026 fine Cu
289.5	Amyg, red g.m. fine gr., small white amygs					
292.1	Amyg, red to green g.m. white amygs, no vis Cu.					
298.1	Amyg., red g.m. white amygs. 3" miarolitic section at 292.3, tiny specs Cu at 295.5					
309.7	Ophite, fine gr. dense, occas amyg., reddish g.m. 0.1 carb at 306.5 at 15°, 0.5 carb at 308.4 at 30°					
339.3	Ophite, med to cse gr., gradational from above, trap-like, irregular FeO thread at 317					
357.5	Ophite, med to fine gr, dense, trap-like					
370.2	Ophite, fine gr, dense, trap-like. FeO thread at 15° at 366.9, chl slip at 30° at 368.3					
371.9	Slaty material, very fine gr, dense, specs Cu	40				0.052
380.0	Conglomerate, generally reddish g.m., med to fine gr. few angular fragments					
385.0	Congl., red g.m. med to fine gr, no vis. Cu, best but sampled as check	43				0.25
404	Congl, med to fine gr, reddish g.m.					
413.8	Congl. fine gr. reddish g.m. soft sandy rock, pale green colour, few pebbles at 407.7. to 408.9					

PROPERTY

HOLE NUMBER 8 cont'd

DIAMOND DRILL RECORD

SHEET NUMBER

SECTION FROM TO

LOCATION: LAT.....
 DEP.....
 ELEVATION OF COLLAR
 DATUM.....

STARTED
 COMPLETED
 ULTIMATE DEPTH
 PROPOSED DEPTH

DIRECTION AT START: BEARING
 DIP.....

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
413.8-415.3	Congl. fine gr, reddish g.m. $\frac{1}{4}$ " piece Cu at 414.5 in $\frac{1}{2}$ " fracture carb	7944				0.025
420.6	Congl. fine gr, reddish g.m.					
422.3	Slaty material, fine gr, soft, red g.m., few pebbles					
425.7	Congl, fine gr, reddish g.m. Carb fracture at 30° at 425.3					
429.0	Slate and congl, $\frac{1}{2}$ and $\frac{1}{4}$ parallel to core, carb fracture in the congl only at 426.5, 0.4 carb zone, highly fractured at 428					
441.5	Amyg. soft, fine gr. purplish g.m., many small carb fractures, 0.1 carb at 433.3 at 40°, red and white $\frac{1}{8}$ " amyg.					
469.5	Amygdaloid, fine gr, red to purple g.m., green $\frac{1}{8}$ " to $\frac{1}{4}$ " amyg. but fewer of them. 12' carb. str. parallel to core at 445.0. 0.1 carb at 40° at 451, 0.1 carb at 45° at 455.3 with epidote					
480	Amyg., fine gr, red g.m. few $\frac{1}{8}$ " green amyg., which give place to white amyg. at about 477.0					
	Dip test at 450-					

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 9
 SHEET NUMBER
 SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT... 200' East (same as No.7)
 DEP.
 ELEVATION OF COLLAR
 DATUM
 DIRECTION AT START: BEARING 90°
 DIP

STARTED July 16, 1942
 COMPLETED July 20, 1942
 ULTIMATE DEPTH 376'
 PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
0 - 6.0	Casing					
12.5	Ophite, med to cse gr, reddish tint, slightly altered					
13.5	Lost core					
14.8	Ophite, med to cse, red tint irreg. chl slips					
15.8	Lost core					
24.0	Ophite, med to cse gr, 0.1 carb at 90 at 19.6'					
26.0	Ophite, with carb, core full of holes as if leached, med to fine gr					
27.0	Lost core					
30.0	Ophite, str. carb at 27.7					
31.0	Lost core					
34.5	Ophite, med to cse gr. slight red tint, becoming more pronounced toward 34.5, 0.1 carb at 90° at 34.4					
35.5	Lost core					
37.0	Ophite, med to cse gr. well mottled, red tint					
45.5	Ophite, well mottled, med to cse gr, red tint less apparent, carb str at 44.2 at 30°					
87.2	Ophite, med to cse gr. well mottled no red tint, FeO thread at 48.1 at 40°, slaty brown str. at 53.6 and at 54.0 at 30°, 0.4 carb zone at 60.0 at 90°, slaty, brown, seam at 64.7 at 40°, 0.1 carb at 90° at 81.9, several chl slips at ave. of 30°					
87.9	Green carb zone, no vis Cu					
104.7	Ophite, cse gr, well mottled					
105.0	Clay-like mat'l, very dense, fine gr, tan					
105.4	Ophite, cse gr, green, well mottled					
105.6	Clay mat'l, dense, fine gr, tan colour					
108.2	Ophite, med to cse gr. well mottled, long chl slips at 10° at 106.1, Specs Cu at 106.9, 1/4" clay-like seam at 107.9 at 15°					

PROPERTY

HOLE NUMBER 9 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT.....
 DEP.....
 ELEVATION OF COLLAR
 DATUM

STARTED

COMPLETED

ULTIMATE DEPTH

PROPOSED DEPTH

DIRECTION AT START: BEARING
 DIP

SM-405

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
108.2- 109.5	Ophite, fine gr, dense, trap-like, almost no mottling					
112.6	Ophite, med to cse gr, well mottled, spec Cu at 111.7					
113.6	Lost core					
114.8	Ophite, med to cse gr, chl slip at 30° at 114.1 with specs Cu					
115.8	Lost core					
129.1	Ophite, med to cse gr, mottling distinct becoming denser with less distinct mottling, specs Cu at 115.1, Chl slip at 124.3 at 30° with specs Cu small flake Cu at 125.8					
162.0	Ophite, med to cse, red tint, light color ed g.m. abrupt change from dk to light colour at 129.1 Chl slip at 132.6 at 65° with spec Cu, pin Pts Cu in ophite at 134.1, chl slip parallel core with specs Cu					
185.1	Ophite, med to cs gr, well mottled, no red tint at first, reappearing at 170', carb fracture at 90° at 177.0					
187.6	Congl, med to fine gr, red g.m. smooth marble-like texture, occas spec of Cu (very tiny)	7941				0.05
190.1	ditto	42				0.025
201.7	Congl, med to fine gr, red g.m. smooth texture, no Cu vis					
214.4	Congl., med to cse gr, red g.m. much rougher texture than preceding congl.					
221.6	Congl. fine gr, red g.m. no Cu					
227.2	Congl. med to fine gr, red g.m. Amy fragments as well as round pebbles, green rock inclusion at 224.5					
230.7	Amyg. fine gr. small 1/8" and less amygs					

PROPERTY

HOLE NUMBER 9 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

 LOCATION: LAT.
 DEP.
 ELEVATION OF COLLAR
 DATUM
 STARTED
 COMPLETED
 ULTIMATE DEPTH
 PROPOSED DEPTH
 DIRECTION AT START: BEARING
 DIP

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
230.7-270.8	Ophite, med to cse gr, occas amyg, dense trap-like slight red tint, 0.2 carb fracture at 90 at 249, chl slip at 266 at 70°				
279.8	Ophite, fine gr, quite dense, trap-like, red tint				
284.9	Ophite, med to cse gr, trap-like, red tint				
303.6	Ophite, fine gr, trap-like, red tint, occas FeO slip, fine irregular thread of carb, occas amyg				
317	Ophite? very fine gr, not much mottling, dense, trap-like, red tint occas amyg, carb fracture at 40° at 305.6, 1/2" carb fracture at 310.2 at 15° 0.3 carb fracture zone at 312.6 with fine str of carb (white and pink)				
323.5	Ophite, fine gr, trap-like, dense dark in colour, occas amyg.				
337.1	Ophite, fine gr, reddish tint, dense, trap like, occas amyg.				
363.1	Amyg., fine gr, red g.m. many white, few green, increasing in size toward 350, no vis Cu				
376	Amygdaloid, fine gr, dense, red g.m. few amygs, no vis. Cu				

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 10

SHEET NUMBER

SECTION FROM

TO

DIAMOND DRILL RECORD

LOCATION: LAT. 300 West
DEP.

STARTED July 20, 1942

ELEVATION OF COLLAR

COMPLETED July 22, 1942

DATUM

ULTIMATE DEPTH 298
Length Horz. 210
PROPOSED DEPTHDIRECTION AT START BEARING N 47° 16' W
DIP -45°

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	G.O.D.S	SLUDGE GOLD †	% Cu
- 13	Casing					
30.5	Ophite, cse gr. slight red tint, 0.1 carb and chl at 27.3 at 90°					
31.2	Carb and chl zone, scattered free Cu	7945				0.13
43.3	Ophite, massive cse gr, red tint, chl slip at 90° at 36.1 with specs Cu					
43.8	Carb and chl zone, scattered fine Cu	46				0.31
87	Ophite, cse gr. red tint, 1/2" carb at 90° at 51.8, chl slip at 59.5 at 45° with 1/4" flake Cu and small pin pts Cu, 0.2 carb and chl at 75.0 at 90° with specs Cu. Chl slips at 77.5 and 77.8 at 90° with pin points Cu. 0.1 Carb at 90° at 80.8					
125.3	Ophite, cse gr, red tint stronger chl slips at 87.4 at 87.8 at 90° with pin pts Cu, Pin pts Cu in Ophite at 88.9, 0.1 carb and chl fracture at 30° at 95.6 with pin pts Cu, 1/4" chl and carb fracture at 90° at 98.7 with pin pts Cu					
135.5	Ophite, fine gr, very red tint, tiny white carb spots					
138.0	Amyg, red g.m. fine gr, white amyg, 1/4" pellets Cu in 1st foot	53				0.07
140.5	ditto without vis Cu	54				0.13
143.0	Amyg, darker in colour than above, pellet Cu at 141.5, green amyg	55				0.65
164	Amyg, fine gr, dk. in colour, amyg very few (basaltic amygdaloid?), 0.3' microlitic section at 153.7, large holes					
183.5	Ophite, fine gr, no mottling, occas amyg. very dense and trap-like, very slight red tint					
187	Amyg. red g.m. fine gr, spec Cu at 83.7, blebs Cu at 184.1	56				0.03

PROPERTY

HOLE NUMBER 10 cont'd

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT.
DEP
ELEVATION OF COLLAR
DATUM

STARTED

COMPLETED

ULTIMATE DEPTH

DIRECTION AT START: BEARING
DIP

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	1 Cu
187 - 199	Amyg. red g.m. Fine gr. large white amygs, gradationally denser and finer grained rock with fewer amygs toward 197					
237.8	Ophite, med to fine gr, dense, dark trap-like, occas green amygs, chl and carb slip at 231.8 at 90°, red tint in ophite at 229.8-231.0, 0.2 carb and chl slip at 90° at 235.0 Spec Cu in small carb fracture at 237.2					
241.1	Congl., med to cse gr, generally red g.m. 0.2 chill zone with specs Cu at 237.8, occas blebs Cu throughout	7957				0.35
298	Congl, med to cse gr, reddish g.m.					

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 11

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT. 33' N and 15' E of 300 E
 DEP
 ELEVATION OF COLLAR
 DATUM
 DIRECTION AT START: BEARING N 46' 23' W
 DIP -51°

STARTED July 21, 1942
 COMPLETED July 23, 1942
 ULTIMATE DEPTH 281
 Length Hrs. 176'
 PROPOSED DEPTH

FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	BLUES GOLD \$	% Cu
7.5	Casing					
21.9	Ophite, fine gr, massive, 0.2 limonite and carb at 13.3, chl slip at 20.0 at 30° with pin pts Cu					
23.0	Ophite, fine gr, massive flake Cu over .5', pin pts Cu in rest of it	7947				0.42
57.2	Ophite, fine gr, massive, slaty mud seam at 25° at 30°, 1/8" carb str. at 51.0' at 90° with spec Cu. Small carb str at 53 with spec Cu. Carb chl slip at 80° at 53.5 with pin pts Cu. small carb and FeO str at 56.3 with specs Cu					
59.5	Ophite, fine gr, slight red tint, specs Cu throughout on slip planes	48				0.04
66.5	Ophite, fine gr, slight red tint, at 59.6, 0.1 carb and limonite band at 25°					
70.1	Ophite, fine gr, red tint, scattered fine specs Cu. 0.2 carb at 66.7 with specs Cu	49				0.04
113.7	Ophite, med to fine gr., slight red tint, specs Cu in 1/8" carb fracture at 71.7, 0.1 carb at 40° at 76.7					
118.0	Amyg., red g.m. grading darker toward 118, cse white amyg, occas spec Cu throughout	50				0.07
120.1	Amyg. dk red, fine gr, white and pink amygs, No Cu					
124	Ophite (amygdaloidal basalt?) fine gr, green amygs disappearing later					
125	Lost core					
127.5	Ophite, fine gr. very occas amyg, slight red tint					
128.0	Lost core					
148.9	Ophite, occas amyg, fine gr. 0.1 carb at 128.8 at 90°					

PROPERTY

HOLE NUMBER 11 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM

TO

LOCATION: LAT.
DEP
ELEVATION OF COLLAR
DATUM

STARTED

COMPLETED

ULTIMATE DEPTH

DIRECTION AT START BEARING
DIP

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD g	SLUDGE GOLD g	% Cu
148.9- 150.3	Carb zone at 60°, no Cu					
160.5	Ophite (amyg basalt?) fine gr. quite a few amygs, 0.2 carb and chl at 90° at 152.7					
162.0	Lost core					
164.1	Ophite, dk trap-like, fine carb str. at 159.6 at 90°					
166	Amyg. reddish g.m. fine gr. small amygs. 0.6 carb. zone preceding amyg. Specs cu in amyg	7951				0.03
167.5	Lost core					
171.2	Amyg. red g.m. fine gr. occas. spec Cu	52				0.03
172.5	Amyg. dk red to purple g.m. large green amyg					
173	Amyg. red g.m. fine gr					
174	Lost core					
175	Amyg. fine gr, red g.m. small green amygs					
176	Lost core					
178	Ophite, fine gr, trap-like					
179	Lost core					
185	Ophite, fine gr, dk red tint, occas amyg					
188.0	Ophite, fine gr., light red altered colour, 0.4 carb. at 186.6 at 15°					
213	Ophite, fine gr, dk and trap-like, fine white specs of carbonate					
222.3	Congl., med to cse, red g.m. granular					
223.3	Lost core					
234.5	Congl. med. to cse., red g.m. granular					
235.5	Lost core					
263.5	Congl. med gr. Red g.m. very granular					
264.5	Lost core					
281	Congl. med to fine gr, red g.m.					

PROPERTY Charles Jones Location, Michipicooten Island

HOLE NUMBER 12

SHEET NUMBER

SECTION FROM

TO

DIAMOND DRILL RECORD

LOCATION: LAT. 300 W
DEP

STARTED July 23, 1942

ELEVATION OF COLLAR

COMPLETED July 26, 1942

DATUM

DIRECTION AT START: BEARING N 47° 16' W
DIP -78°ULTIMATE DEPTH 339
Length Horiz. 68
PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD g	SLUDGE GOLD g	% Cu
0 - 13	Casing					
57.1	Ophite, cse gr, well mottled specs Cu at 15.9, 16.5, 16.9, Chl slip parallel to core at 19.1 to 20.0 with small flakes Cu. Flake of Cu at 40.6; 0.1 carb at 90° at 54.2 with specs Cu					
58	Ophite, altered and carbonatized, no Cu					
103.3	Ophite, massive cse gr, well mottled, reddish tint Cu on slip plane at 72.4 at 60° Cu specs in ophite at 81.6					
108.9	Ophite, verging on amygdaloidal, fine gr, reddish tint, fair amount of leaf Cu between footages of 105.6 and 106.9					
136	Ophite, med to cse gr, well mottled, reddish tint, spec Cu at 116.2, at 118.6, slip plane // core fair amount of flaky Cu. Spec Cu in $\frac{1}{2}$ " carb and chl slip at 90° at 121.6					
137.7	Ophite, fine gr, red colour, tiny spec Cu at 136.1					
157.7	Ophite, med to fine gr, well mottled, red tint					
179.6	Ophite, fine gr, red tint, tiny white specs of carb. Carb fracture at 20° at 161.2, bottom 6 inches have quite a few small amyg.					
181.7	Tuff, fine gr, red to br g.m. almost fine congl. at upper contact. Specs Cu on upper contact					
183.4	Ropy lava flow top, contorted with 0.3' beaded volcanic ash at top, 1' sample 182 and 183.0	7958				0.05
232.3	Amyg, lava, fine gr, green amyg, red g.m. $\frac{1}{2}$ " carb at 191.2 at 45° with 1/8" pellet Cu					
236.7	Amyg. cse gr., red g.m. large white amyg, small specs Cu at 232.4					

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 13

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT. 33' N and 15' E of 300 E
 DEP.

STARTED July 24, 1942

ELEVATION OF COLLAR

COMPLETED July 30, 1942

DATUM

ULTIMATE DEPTH 393

DIRECTION AT START: BEARING N 46° W
 DIP - 85°

Length Horz. 35
 PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
0 - 6.2	Casing				
64.3	Ophite, fine gr, quite dark and dense, spec Cu on slip plane at 45° at 29.7, Spec Cu at 42.5 0.1 carb at 56.5 at 90°				
64.8	Lost core				
91.0	Ophite, fine to med gr, well mottled, dark and dense				
92	Lost core				
93	Ophite, fine gr to med, well mottled				
95	Lost core				
101.8	Ophite, fine to med gr. well mottled				
102.8	Lost core				
145.7	Ophite, fine to med gr, well mottled				
147.1	Chl and carb zone, no Cu visible				
173.2	Ophite, fine gr, gradationally lighter in colour and finer in grain				
183.4	Amyg. med gr, white amygs, small specs Cu at 175.5				
201.8	Amyg, fine gr, dense, dark 1/8" green amygs				
205	Congl dense (small pebbles) smooth, fine gr, light pink colour				
208	Lost core				
238.5	Congl. dense (small pebbles) fine gr, pink colour				
239.5	Lost core				
332.1	Congl, dense (small pebbles) fine gr, pink colour				
359.4	Ophite, med to coarse, dense, well mottled, slight red tint				
361.1	spec Cu. at 360.6				
393	Ophite, med to fine gr, red tint, carb zone 375.5-376.3				

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 14

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT. 725' W
 DEP 36' S of Base Line

STARTED

ELEVATION OF COLLAR

COMPLETED

DATUM

ULTIMATE DEPTH 248

DIRECTION AT START: BEARING N. 44° 03' W
 DIP - 57°

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
0 - 14	Casing				
18	Ophite, cse gr, well mottled				
19	Lost core				
30	Ophite, med gr, red tint, consid.alteration with many irreg. FeO and carb stringers				
32	Lost core				
39	Ophite, med gr. red tint, FeOand carb.stringers				
40	Lost core				
71	Ophite, med gr, red tint, well altered, 0.1 carb at 90° at 43.0'				
114.5	Ophite, cse gr, well mottled, slight red tint, 0.2 carb at 107.9 at 90°				
127.3	Ophite, med to fine gr, red in colour, occas FeO str. and amyg.				
138.5	Ophite, med gr, no red tint, well mottled				
150	Ophite, fine gr, FeO stringers, slight red tint				
160	Ophite, red tint predominant, occas.amyg.toward 160', generally fine grained				
166.3	Amyg, fine gr, red g.m. large white amygs, No Cu visible				
182	Amyg, fine gr, dense, red g.m. 1/7" green and white amygs, becoming scarcer toward 182				
189	Lost core				
207.1	Amyg, fine gr, red g.m. very small green amygs				
217.7	Amyg. red g.m. fine gr. white amyg. small spec Cu at 208.9, white amygs replaced by green amygs gradationally				
230	Amyg. green g.m. fine gr				
233	Amyg, red g.m. small white and green amygs				
248	Ophite, dense, trap-like, spec Cu at 240.5				

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 15

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM

TO

LOCATION: LAT. 1400 E near east shaft
DEP.

STARTED July 31, 1942

ELEVATION OF COLLAR

COMPLETED Aug. 7, 1942

DATUM

ULTIMATE DEPTH 485'

DIRECTION AT START: BEARING N 32° 58' W
DIP - 42°

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
0 - 15	Casing				
27.9	Ophite, med to fine gr, well mottled				
32.8	Amyg, fine gr, red g.m. 1/4" white amygs, No Cu vis.				
61.0	Ophite, fine gr, dense, very occas amyg				
62.0	Lost core				
66.7	Ophite, fine gr, dense, very occas amyg.				
72.0	Amyg., fine gr, dk red g.m., small white amygs				
103.3	Amyg, dk gray to green g.m. green 1/4" amygs and occas white amyg				
104.2	Amyg. great deal of white carbonate				
112.5	Congl. fine gr, red g.m. occas amyg				
114.5	Lost core				
117.5	Congl, fine gr, red g.m.				
118.5	Lost core				
124	Congl, fine gr, red g.m.				
126	Lost core				
127	Congl. red g.m. fine gr, cse sandy texture				
130	Lost core				
193.5	Congl. red g.m. fine gr, cse texture (very occas. amyg?)				
213.6	Congl. cse gr, red g.m. fairly large pebbles				
266	Amyg, cse gr, white amygs, dk brown g.m.				
337.5	Amyg. fine gr, red tint, 1/8" green amygs				
379.5	Ophite, fine gr, red tint, occas 1/8" gr amyg				
436	Ophite, highly altered, cse gr, 0.3' mud seam at 435 at 30°				
437.4	Slate, brown to red, fine gr, dense				
443.0	Amyg, fine gr, reddish g.m. white amygs				
445	Lost core				
447	Amyg. fine gr, cse texture, dark brown g.m., white amygs				

PROPERTY

HOLE NUMBER 13 cont'd

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT.
DEF.

STARTED

ELEVATION OF COLLAR

COMPLETED

DATUM

ULTIMATE DEPTH

DIRECTION AT START: BEARING
DIP

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
447 - 448	Lost core				
449	Amyg, with 0.5' band of carb				
451	Lost core				
452	Amyg				
453	Lost core				
454.9	Amyg				
457.7	Amyg. accompanied with considerable silicification and carbonatization				
464	Amyg. fine gr, cse texture, white amygs				
466	Lost core				
485	Amygdaloid, fine gr, red g.m. cse texture, white amygs				
	(No distinct broad band of the normal (dark green) variety that is seen in neighborhood of main shaft above the congl. what ophite there is, is discolored, tuffaceous and generally altered rock.)				

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM

TO

LOCATION: LAT.
DEP
ELEVATION OF COLLAR
DATUM

STARTED Aug. 6, 1942

COMPLETED Aug. 8, 1942

ULTIMATE DEPTH

PROPOSED DEPTH

DIRECTION AT START: BEARING
DIP -42°

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
0 - 7.0	Casing				
10.3	Ophite, fine gr, mottling good somewhat andesitic after 7.4, gradational to very fine gr with FeO alteration and occas. amyg. toward 10.3				
26.0	Amyg, cse gr, dk g.m. large white amygs. brecciated appearance, no vis Cu				
32.3	Amyg., fine gr, dk g.m. small 1/8" round white and green amygs				
43.0	very fine gr, occas amyg, grading to				
68.0	Ophite, fine gr, red tint good mottling, frequent 1/2" chl fractures at 90°, specs Cu in one such fracture at 48.2, very occas amygs.				
71.0	Lost core				
93.0	Ophite, fine gr, good mottling reddish tint, frequent small chl slips or fractures at 90°				
98.5	Congl. med to cse gr, well defined, some parts of core contain consid. carbonate				
100.5	Lost core				
107.0	Congl. med to cse gr, well defined boulders, red g.m.				
109.0	Lost core				
134.0	Congl. med to cse gr, well defined, reddish g.m.				
136.0	Lost core				
141.3	Congl., med to cse gr, red g.m. well defined				
144.5	Lost core				
162.0	Congl., med to cse gr, red g.m.				
165	Lost core				
207	Congl., med to cse gr, red g.m. well defined				
(No evidence of any copper at top of congl bed)					

501 KSS

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 17

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT. 1200 E
DEP

STARTED August 8, 1942

ELEVATION OF COLLAR

COMPLETED August 12, 1942

DATUM

ULTIMATE DEPTH 260

DIRECTION AT START: BEARING N 49° 54' W
DIP -42°

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
0- 15	Casing				
52.7	Ophite, fine gr, well mottled, slight red tint				
53.7	Amyg, cse gr, red g.m. large white amygs				
66.2	Ophite, fine gr, dense, indistinct mottling, occas small green amyg.				
91.0	Amyg, more of a brecciated amyg than a straight amyg lava, red g.m. white amygs				
200.0	Ophite, med to fine gr, good mottling, red tint				
215.5	Amyg, fine gr, red g.m., small white amygs				
220.5	Ophite, fine to med gr, good mottling, red tint				
232.2	Amyg, fine gr, brown to green g.m. 1/8" green amygs				
239.8	Amyg, fine gr, some large white amygs, red g.m.				
260	Congl. med to cse gr, reddish g.m. well defined pebbles				

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 18

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT.
 DEP
 ELEVATION OF COLLAR
 DATUM

STARTED Aug 11, 1942

COMPLETED Aug. 14, 1942

ULTIMATE DEPTH 209'

DIRECTION AT START BEARING
 DIP - 65°

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$	% Cu
0 - 14	Casing					
110.8	Ophite, fine to med gr, red tint well mottled, a good green ophite in large part					
134.0	Amyg. fine gr, red g.m. large white amygs					
193.7	Ophite, fine gr. reddish tint, frequent $\frac{1}{8}$ " to $\frac{1}{4}$ " chl skips at 90°, good mottling					
194.8	Congl, med gr, top of congl horizon, some carb present, small $\frac{1}{8}$ " pellets of Cu	7961				0.73
195.8	Congl. med gr, no vis Cu	62				0.08
209	Congl, med gr, red g.m. well defined					
<p>N.B. a good chill ct. at bottom of ophite at 192-194 Cu mineralization is localized on both sides of this ct.</p>						

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 19

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM

TO

LOCATION: LAT. 900 E
DEP

STARTED Aug. 13, 1942

ELEVATION OF COLLAR

COMPLETED Aug. 16, 1942

DATUM

ULTIMATE DEPTH 337

DIRECTION AT START BEARING N. 48° 20' W
DIP - 50°

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
0 - 11	Casing				
49.6	Congl., med gr. red g.m. well defined				
60	Ophite, med to cse gr, slight red tint, spec Cu on Chl slip at 50'. Frequent chl slips at all angles				
61	Lost core				
62.5	Ophite, med to cse gr, slight red tint				
64.5	Lost core				
67	Ophite, med to cse, slight red tint				
68	Lost core				
69	Ophite, med to cse gr, red tint				
72	Lost core				
72	Ophite, med to cse gr, red tint				
74	Lost core				
76.5	Ophite, med to cse gr				
77.5	Lost core				
83.2	Ophite, cse gr, well mottled				
103.7	Congl. med gr. smooth texture, red g.m. well defined, small spec Cu at 84.7, 0.4' sec'n congl. with considerable carb showing, few specs Cu at 99.6, spec Cu at 102				
154.9	Ophite, cse gr, well mottled				
156.1	+ Congl, med gr. red to br g.m.				
215	Ophite, cse gr, well mottled, red tint strong				
295.5	Ophite, cse gr, well mottled, no red tint				
308.1	Ophite, med gr. consid. FeO alt.				
332.0	Ophite, cse gr, well mottled				
337.0	Ophite, med gr. FeO alt present				
	+ This is more like an agglomerate No bx'd zone in the ophite which is quite cse and normal on both sides of it.				

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 20

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT.
DEP
ELEVATION OF COLLAR
DATUM

STARTED Aug. 16, 1942
COMPLETED Aug. 18, 1942
ULTIMATE DEPTH
PROPOSED DEPTH

DIRECTION AT START: BEARING
DIP -45°

DEPTH FEET	FORMATION	SAMPLE No	WIDTH OF SAMPLE	GOLD \$	SLUDGE GOLD \$
0 - 12	Casing				
20.5	Congl., red g.m. med gr.				
29.3	Congl, red g.m. consid. mud in seams, fewer pebbles, some carb present				
38.6	Congl ? bottom of horizon, has a brecciated appearance				
52.0	Amyg. fine to med gr., dk gray g.m. white amygs				
181	Ophite, gray to light gray colour, fine gr, green amygs, very fine gr at top grading to coarser at greater depths, with red tint developing and becoming streaky, frequent chl slips at 90° from 90 - 103'				
185	Ophite, very fine gr				
202	Amyg. dk red to br. g.m. ese gr., white amygs				
274	Ophite, very fine gr., minute mottling, occas. green 1/8" - 1/4" amyg				
275	Congl and ophite, bottom of ophite flow, and top of cong l bed, scattered fine Cu				
289	Congl. med gr. reddish g.m. well defined				
	Good cgl. to 20.5' 20.5 to 38.6 is not likely cgl. but rather a bx'd and ropy phase at top of succeeding ophite.				

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 21

SHEET NUMBER

SECTION FROM TO

DIAMOND DRILL RECORD

LOCATION: LAT. 600 E
 DEP

STARTED Aug. 17, 1942

ELEVATION OF COLLAR

COMPLETED Aug. 19, 1942

DATUM

ULTIMATE DEPTH 216

DIRECTION AT START: BEARING N 56° 13' W
 DIP -50°

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD g	SLUDGE GOLD g
0 - 10	Casing				
99	Ophite, fine to med gr. well mottled, red tint, small pellets Cu at 24.4, $\frac{1}{2}$ " carb fracture at 90° at 27.0' frequent chl slips at all angles Carb and chl zone 64.5-65.6. 0.2 chl and carb at 84.1 with pin pts Cu				
100	Lost core				
110.5	Ophite, fine to med.gr, reddish tint becoming stronger				
123.2	Amygdaloid, fine gr, red g.m. 1/8" white and pink amygs, specs Cu at 111.6, 118.8, 121.3				
148.3	Amyg. fine gr, dk gray coloured g.m. 1/8" and less green amygdules				
151.1	FeO alteration zone				
159	Amyg. fine gr, 1/8" gr amygs				
163	Amyg, fine gr, large white amygs, reddish g.m.				
179	Amygdaloid, fine gr, brown g.m. 1/8" to 1/4" green amyg.				
205	Amyg. lava, fine gr, dk g.m. 1/8" gr amygs				
207	xxxxxx				
216	Congl. marle-like, multicolored, 2' brecciated top Congl, cse gr, red g.m. well defined				

\$ SM. 495

PROPERTY Charles Jones Location, Michipicoten Island

HOLE NUMBER 22

SHEET NUMBER

DIAMOND DRILL RECORD

SECTION FROM TO

LOCATION: LAT. 500 W
 DEP.

STARTED Aug. 20, 1942

ELEVATION OF COLLAR
 DATUM

COMPLETED Aug. 22, 1942

DIRECTION AT START: BEARING N 45° 53' W
 DIP -50°

ULTIMATE DEPTH 180'

PROPOSED DEPTH

DEPTH FEET	FORMATION	SAMPLE NO	WIDTH OF SAMPLE	GOLD g	SLUDGE GOLD g
0 - 8	Casing				
43.5	Ophite, med to cse gr, to 24', med to fine afterwards				
48.5	Amyg. fine gr, reddish g.m. small green and white amygs				
66.5	Amyg. fine gr, g.m. has slight red tint, 1/4" green amygs				
67.5	Lost core				
89	Amyg. fine gr, slight red tint, 1/8" green amygs				
98.2	Amyg. red g.m. fine gr, large white amygs. Specs Cu at 95.8				
141.5	Amyg. dk brown g.m. fine gr, 1/8" to 1/4" green amygs, becoming progressively smaller after 104				
180	Congl. med gr, reddish g.m. spec Cu at 142.4				

NO	Feet	cut	Remarks
1	353.0	July 1972	2 inches from location
2	411.0	July 1972	" " "
3	438.0	" "	" " "
4	300.0	" "	" " "
5	400.0	" "	" " "
6	331.0	" "	" " "
7	251.0	" "	" " "
8	750.0	" "	" " "
9	320.0	" "	" " "
10	370.0	" "	" " "
11	380.0	" "	" " "
12	387.0	" "	" " "
13	300.0	" "	" " "
14	350.0	" "	" " "
15	425.0	" "	" " "
16	207.0	" "	" " "
17	200.0	" "	" " "
18	207.0	" "	" " "
19	337.0	" "	" " "
20	259.0	" "	" " "
21	216.0	" "	" " "
22	180.0	" "	" " "
<u>22</u>	<u>7,170.0</u>		

Main Shaft cut and located in Main level
 at 300 feet, 1972

Level 1 - 300 feet, 1972, 100 feet from shaft
 Level 2 - 300 feet, 1972, 100 feet from shaft
 Level 3 - 300 feet, 1972, 100 feet from shaft
 Level 4 - 300 feet, 1972, 100 feet from shaft
 Level 5 - 300 feet, 1972, 100 feet from shaft

OFFICE shaft cut by, cut, level of 400 (300 feet) x cut
 BATHERS shaft cut by, cut, level of 400 (300 feet) x cut
 some of Main shaft workings.

NOT TO BE REMOVED FROM
DIAMOND DRILLING AT QUEBEC MINE
THE OFFICE OF THE MICHIPICOTEN ISLAND
GEOLOGIST, ONT. DEPT. OF MINES
SAULT STE. MARIE, ONT.

J.G. Berry
Science '43

Michipicoten Island is situated in the north-eastern end of Lake Superior, ten miles south of the North Shore, which, toward the western end of the island, bears a little north of west, and swings still more to the north as the shore line extends west. The Puckaswa River is almost due north of the western tip of the island. Seventeen miles long by seven miles wide, the island is extremely rough in character, covered with dense undergrowth and short stunted trees of unmerchantable value, and having several lakes and many hills.

Quebec Mine is situated in the Charles Jones Location, a tract of land comprising some 6,400 acres, occupying the whole of the west end of the island. There are two sites where mining was done, the second of the two being of relative unimportance. The main site is about 3 miles northward along the shore from the west end of the island, while the second is about a mile and a half from the west end in the same direction.

This latter site consisted only of a small prospect shaft and hoist room. At the former, extensive work was done, and there were facilities for the maintenance of 300 people. Workings consisted of 4 shafts, and hoistings, mill, boiler-room, aerial tramway, and accessory buildings. The village was systematically laid out at the base of a 300-foot high cliff, which ran behind the mine and projected into the lake at the north-west point of the island.

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The report of the Royal Commission on the Mineral Resources of Ontario (1890) refers to the general structure of the island and its resources in copper and agate. (p 381). Evidences as to the nature of the copper deposits and the extent of the mining operations carried out upon them was obtained from excerpts taken from letters written to and by the late Mr. Joseph Cozens, D.L.S., of Sault Ste. Marie. From the evidence obtained it appears that copper occurs in two distinct classes of deposits on the Charles Jones location, a conglomeration vein some 8 feet in width and an amygdaloid upon which the principal work was done, both deposits being parallel with the general strike and consisting of impregnated material, as at the principal deposits of the Keweenaw point, and of veins transverse to the formation.

Drilling was done for the M. J. O'Brien, Ltd., of Ottawa, by the Continental Diamond Drilling Co., of Rouyn, Que. The crew was composed of a setter and foreman, six runners and six helpers, a cook and an engineer, 15 men in all. Two machines and accessories, 1500 feet of A-rods, camping stores and engineer's stores including a transit and a core-splitter, comprised the total equipment taken.

The equipment was shipped by box car to Michipicoten Harbour, the crew following. A tug from the Jas. Purvis Fish Co. transported both crew and equipment to Quebec Harbour on the south shore of Michipicoten Island.

The next five days were spent in transporting the equipment in small 20-foot boats around to the west side of the island, a distance of some 15 miles by water. Camp was set up

during this period, and actual drilling was begun on June 30th.

A small dock was built out into the lake to a depth of 5 feet to facilitate loading and unloading of equipment and supplies. A good deal of half rotten but still serviceable lumber was found at the site of old buildings, and was put to good use as floor, walls and framework for the tents. One shack was built to serve as living and working quarters for the setter and also as a tool storage room. It was completely covered with tar paper as were the walls of the tents. The cook tent was 12' x 17' and was furnished with a large box stove. There were 2 12' x 14' sleeping tents for the drill crew, 1 7' x 9' tent for the engineer and another of the same size to serve as an "office". Each of the tents was supplied with a small camp heater sufficient to keep them warm in the cool evenings. Fuel was plentiful in the form of drift wood on the beach. This was very fortunate since that particular section was not very heavily wooded. Coleman lanterns burning naphtha gasoline supplied light for the camp at night.

A base line was laid out and cut through the bush for a distance of 2200 feet and cross-lines were cut at right angles to this line every 100 feet, from the lake back to the cliffs. Holes were spotted on, or nearly on, these cross-lines at varying distances from the main base line, the idea being such as to cut the main lode at a depth of 125 feet. Some idea although a very meagre one, was gained of the original underground workings by study of maps both in plan and elevation of the development and mining in the vicinity of the main shaft.

Both machines were started at the site of the main shaft and worked away from each other. The first hole struck one of the workings at 358 feet, fortunately, no damage being done. No further difficulty of this nature was encountered.

Two Wisconsin drills were used, each one being of 35 H.P. Rods used were "A" rods, although the machine heads could take only "E" rods. For this reason reducer couplings were used to connect the two different sizes of rods. It was decided that "A" rods would be used since the ground being drilled was unknown to the drillers and no records could be found of any previous drilling which would give any indication of what might be expected. Late in the summer old core was found at the site of one of the holes but no trace of the holes itself could be found. This core was smaller than present day "A" core, but larger than "E" core, and was probably what is known as "Standard A" core. The decision to use the large "A" rods proved to be a valuable one when drills struck unexpected soft spots, but still made core which would otherwise have been lost had "E" rods been used.

A.X.T. cast-set bits were used throughout the greater part of the drilling. Also cast set reaming shells were used. Here bits and shells were set with Bortz diamonds and stood up fairly well in most holes. Where the going proved to be too tough, hand-set bits using "Congo" and even "black" diamonds were employed.

Five pumps were included in the equipment, 2 Smart-Turners and 3 Fairbanks-Morse. One was held in reserve. Water

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was pumped from Lake Superior up to a barrel by the machine by one pump, and a second pump at the machine forced the water down the hole.

Pumping materials were brought along, but since the greater percentage of the surface rock was valueless ophite, holes were spotted on bed-rock near the cross-lines. It was reasoned that the time saved by off-setting the holes to do away with piping would more than compensate for the exactly uniform drilling pattern which would be produced if piping were resorted to. The rock proved to be of medium hardness while in some places it was quite soft.

Drilling proceeded at a rate of about 40 feet per machine shift. Some of the conglomerate struck was soft and gritty and great difficulty was encountered in making any core at all. Other holes caved at depth and operations had to be suspended while the holes were cemented up past the cave and then drilled out. A quick hardening cement was used and only 8 to 10 hours were lost in waiting for the cement to harden.

Geology

¹ "The rock which forms the cliff behind the mine consists at the top of irregular masses of purplish amygdaloid embedded in a matrix of calcite and feldspar, gradually assuming a non-fragmental form toward the lower part. The amygdaloid has a dark brown, ferrite-stained matrix with microliths of plagioclase in places radially arranged. Augite also occur as phenocrysts, sometimes also in grains bounded by plagioclase. There are

1. E. M. Burwash, Michipicoten Island, p.39, Section 25.

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large amygdules filled with zeolitic material radially arranged or with an outer band of zeolites and a central part occupied by striated calcite, and also pseudamygdules filled with calcite and fragments of the matrix. The lower part of the bed presents the character of an ophite under the microscope, having areas of optically continuous augite intersected in all directions by plagioclase crystals, and separated by bands in which the interstices are occupied by a dark iron-stained base containing magnetite grains, and in places by chlorite alteration products".

The rock which outcrops between the mine and the cliff is ophite, with much chlorite. The characteristic nodular surface is well shown on this flow. Magnetite occurs frequently and olivine is largely replaced by chlorite.

The next flow is an ophite having a purplish-red amygdaloid which is fairly strong in its upper parts but which grows leaner with depth.

Outcropping in the water a short distance off shore, and running up on to the shore at the cave is a band of amygdaloid.

The western shaft of the Jones Location is sunk on the contact of a conglomerate (north side) and an ophite which is amygdaloidal at the top gradually grading into a fine grained dark coloured rock, andesitic in character, and very similar to the rock which forms the cliff behind the main workings. According to the map in Burwash's Report on Michipicoten Island, it is the same flow.

The succeeding flow is conglomerate. This flow outcrops

near the north-western top of the island. ¹ "Where exposed on a small island near there, the matrix is mainly composed of comminuted rocks of the series, and contains pebbles among which the following rocks were observed:

- (1) Dark purplish amygdaloid with parallel amygdules.
- (2) Purplish quartzless porphyry.
- (3) Reddish felsitic rock, phenocrysts not visible.
- (4) Coarse amygdaloid.
- (5) A fine grained crystalline greyish rock probably a melaphyre.
- (6) (From shaft) red sandstone.

This conglomerate seems not to expand as far as the Quebec Mine. The smaller fragments are angular, those over 3/4 of an inch in diameter being rounded."

The rocks have a strike at the mine of S 45° W which swings around to almost due west at the western shaft of the location. The general dip is S 23° east of south at the mine to 53° due south at the western shaft.

Drill Log Geology

From 660 W to 400 E the rock series is fairly constant and simple and will be described below.

In the vicinity of the main shaft the ophite is fairly fresh, with numerous chloritic slips along which in many instances, copper solutions have deposited a thin network of metallic copper. There is a certain amount of carbonatization and FeO alteration. At the bottom of the ophite bed a band of tuffaceous rock, fine

1. E. M. Burwash: The Geology of Michipicoten Island, p. 39, Section 26.

grained, with a few specks of copper, announced the upper horizon of the amygdaloidal stratum. This amygdaloid bed, in several holes, showed a ropey lava flow top, contorted and twisted, with a four to six inch section of bedded volcanic ash. The amygdules were usually red to green, about 1/4 to 1/2 inch in size, but graded out into large irregularly formed calcite amygdules after four feet of drilling. Any copper of possible economic value was found usually at the upper horizon of the amygdaloid beds. Occasionally microlitic sections were cut through in the amygdaloid bed, but none were very extensive, never more than six inches in depth. These cavities had hard sharp edges suggesting that they had never been filled rather than that they had been leached out. If the latter had taken place, the edges of the cavities would probably have been rounded off to some extent. This first amygdaloidal horizon is approximately 30 feet in thickness.

In holes of 45° or less, a second layer of ophite is cut. This is about 20 feet in thickness, and is very dense traplike with almost no apparent mottling so characteristic of the ophite found on surface and that obtained from the drill hole. There is very little of the reddish tint due to FeO alteration which was abundant in some sections of the upper ophite bed. The next bed found is an amygdaloid much the same as the preceding one with blebs of copper in the upper part of it. The same ropey lava flow top marks this bed. It is on the average about 20 feet thick.

Another bed of ophite, which is not found at depth greater than 150 feet - 200 feet follows the amygdaloid. Similar

in appearance to the preceding one, it has more chloritic slips and more carbonatization in it.

A 3 inch chill zone with specs of copper throughout precedes the conglomerate horizon which follows the ophite. This conglomerate is generally reddish in colour, having small pebbles at the top and larger ones at depth.

At depths greater than 150 - 200 feet, the second and third beds of ophite encountered in the shallower holes are not cut. Instead 2 successive and adjoining layers of amygdaloid, one about 125 feet and the other about 5 feet thick are found. These have the twisted contorted ropey lava flow tops indicating one was deposited on top of the other. There is a six inch chill zone, containing scattered blebs and specs of copper between these two beds. Apparently there was not a large enough ophite flow to completely cover the deepest amygdaloid and the succeeding amygdaloid flow was deposited on top of the preceding one. This is also the case with the conglomerate. At depth there is no ophite flow separating the amygdaloid as at shallower depths.

Copper is found in the native state usually, although bornite was found on one of the old ore dumps. Apart from copper deposition on chloritic slip planes in the ophite the mineral is found almost entirely in the upper portions of the amygdaloid bed. There is extremely little copper found in the bottom portions of these amygdaloid flows. In the conglomerate bed, the copper is confined mainly to the upper few feet of the bed, in the form

of scattered fine grains at the contact and pellets or blebs in the conglomerate itself.

From 400 E to 1200 E, the series becomes very irregular, the first band of ophite dying out in length as well as in depth. At 900 E, the ophite of the second band becomes extremely wide and the amygdaloid thins out so as to be practically non-existent. It is in this hole that two bands of conglomerate are encountered at relatively shallow depths although only one small outcrop of conglomerate was seen.

At the western shaft on the Jones Location the drill core showed a band of amygdaloid which did not outcrop on surface. Copper in this region appears to be concentrated in the upper portions of the conglomerate horizon and none whatever in the amygdaloidal lava flow.

Engineering

Core was laid in core boxes in "book" fashion and was carried down to the core shack. Racks for storing the core were made of tiers of rails found near the main shaft. At the core shack, the core was examined, logged, and specimen samples taken at five-foot intervals or oftener as required. Sections to be assayed were split, one half being kept at the mine, and the other half being sent to the Department of Mines Assay Office at Sault Ste. Marie.

These samples were sent down in lots of not less than 20.

The holes were surveyed for dip at the bottom with a clinometer and for direction at the collar with a transit. The machine heads were set for dip with a Brunton compass. Surface

geology was done by offsets from the cross-lines. Maps were drawn of the holes and a topographic map of the property was made showing outcrops, drill holes, old shafts and buildings.

Supplies

Gasoline and oil were bought at District Services in Sault Ste. Marie and were brought up to the mine by James Purvis and Sons. Other supplies, such as food and clothing, were obtained from the general store, owned and operated by Purvis and Sons at Quebec Harbour. These small items were brought around to the mine in the outboard motorboat belonging to M.J. O'Brien, Ltd. This boat was an 18-foot cedar Peterborough, powered by a 9.5 H.P. Neptune motor.

Because only small boats could be landed at the mine, and because good weather could be relied upon for only 2 and a half months in the summer, men and equipment were moved in shortly after June 15, and taken out by September 1st.

Recreation

Cribbage, poker, and fishing provided the only means of diversion from work, the latter being extremely popular. Lake trout up to 30 pounds in weight were not uncommon.

Report submitted in March 1943
covering operations carried out
in summer of 1942. "C.S."

M-13 - Submitted by A. H. H. field
 Kerr-McGee Group Ltd.

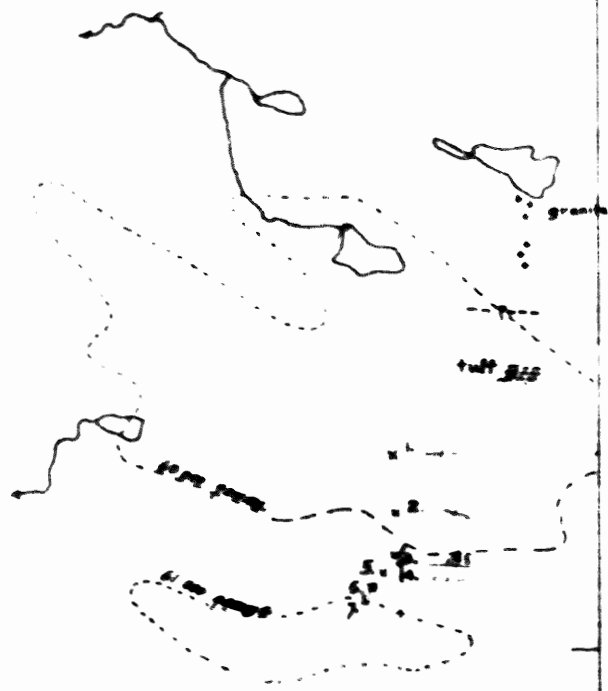
NOTES TO ACCOMPANY ROCK SAMPLES,
 PUKASKWA RIVER AREA

35

85° 30'

48° 15'

NE CORNER SHEET 42 $\frac{5}{4}$
 MAP 2165 G
 PUKASKWA RIVER, ONT
 SCALE: 1:63,360



NOTES ON SAMPLES AND LOCATIONS:

- 1) Strike E-W, vertical dip; Topside not determined. Greenstone tuff with minor pyrite. *pyrite*
- 2) Strike azimuth 115° Vertical dip; Rhyolite. *pyrite*
- 3) Heat rock for sample tuff
- 4) 20' sample of ...
 Dip 85° N Topside ... not determined.
- 5) Looks like intrusive with schistosity parallel to the regional bedding. Probably actually an altered tuff. *pyrite*
- 6.) Location 250' S 45' S5
- 7) Strike E-W, vertical dip; Compass indicates several easily magnetic rocks. *pyrite*

Accuracy of sample locations relative to drainage is usually within 1,000 feet.

October, 1949

QUEBEC MINE

RECEIVED
JUL 1967

NOT TO BE REMOVED FROM
THE OFFICE OF THE RESIDENT
GEOLOGIST, ONT. DEPT. OF MINES
SAULT STE. MARIE, ONT.

RESIDENT GEOLOGIST
SAULT STE. MARIE

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Location

The Quebec mine is situated on the Charles Jones location which comprises about 6400 acres at the western end of Michipicoten island. The mine workings are located near the shore on the northwest side of the island. There is little protection for boats along this part of the coast so a road was constructed from Quebec Harbour to the camp at the time the mine was being worked.

History and Development

The geology of Michipicoten island is very similar to that of the famous copper mining district on the south shore of Lake Superior in the State of Michigan. Consequently the island was prospected for copper at the time the Michigan mines were being opened. The first recorded work was done in 1860-61 on the

S SM-495 4

Charles Jones location and was financed by New York capital. From 1875 to 1880 the Quebec and Lake Superior Mining Association did extensive exploration work, cleared farms, and erected buildings on the Jones location. In 1880 the Michigan Native Copper Company was formed in England to develop the property. Work was done on a very extravagant scale by this company and liquidation followed in 1884. Later the property was acquired by Mr. Joseph Cozens of Sault Ste. Marie.

A village that would accommodate about 300 people was laid out near the lake at the base of a high cliff. Four shafts were sunk; the main shaft was sunk to a depth of 520 feet with five levels; the Butler shaft is reported to be 360 feet deep. According to Cozens¹ there are 1500 feet of drifts and crosscuts

1. Op cit

in the workings. Old records and reports on the property give accounts of interesting copper values underground, but these have not been substantiated by recent drilling. There is no record of any copper production from the island.

In 1942 M. J. O'Brien, Ltd., optioned the Charles Jones location and drilled 18 holes in the vicinity of the old workings and three holes about a mile to the west in another area where there was some evidence of copper. The widths and assays of the copper mineralization were very disappointing and the option was dropped. Much of the information given below has been obtained from the records of M. J. O'Brien, Ltd.

Geology

The rock formations of Michipicoten island have been correlated with the Middle Huronian and are thus of the same age as the host rocks of the Michigan copper deposits.¹ They consist

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1. C.K. Leith, R.J. Lund, and A. Leith. Prof. Paper No. 184.
U. S. G. S. Plate 1
-

of lava flows with some interbedded sediments. The different types and phases of the lava flows have been given such names as pitchstone, ophite, trap, amygdaloid, columnar basalt, felsite, quartz porphyry, etc.² Several of these terms refer to the texture

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2. Thomas MacFarlane, Op cit.
E. M. Burwash, Op cit.
-

of the flows. For example, ophite is the part of a flow that exhibits ophitic texture and amygdaloid is the phase that has amygdaloidal texture. Tuffaceous varieties of the volcanics have also been recognized. The sediments occur in minor amounts and consist chiefly of conglomerate with small amounts of sandstone.

A geological map of the island, prepared by Burwash,³ shows

-
3. E. M. Burwash, Op cit
-

that the flows and beds generally strike in an east-westerly direction, roughly coinciding with the long axis of the island. However, near the Quebec mine workings, the strike swings sharply to the north east. The dips are always to the south or south east and vary from 10 to 15 degrees on the southern

part of the island to 30 to 60 degrees on the north. In the vicinity of the copper mineralization the dips are about 50 degrees (see the section on Fig.).

Mineralization

Copper usually occurs in the native state although small amounts of bornite are found on one of the old mine dumps. According to Cozens,⁴ the bulk of the underground work was done

4. Joseph Cozens. Op cit.

on an amygdaloid similar in character to the lode at the Quincy mine in the Michigan copper district. Later, a mile and a quarter to the west of the main workings, a copper-bearing conglomerate was discovered.

The diamond drill holes put down by M. J. O'Brien, Ltd., in 1942, were spaced at intervals along a strike length of 2200 feet in the vicinity of the main underground workings at the Jones location (see Fig.). The sequence of formations explored is shown by the cross section in this figure. The surface exposures along the zone are all ophite with numerous chloritic slips along which small amounts of native copper have been deposited. Below the ophite there is a four to six inch width of bedded tuff. This is followed by a band of amygdaloid, approximately 30 feet in thickness, which shows a ropy flow top. Most of the copper mineralization occurs in the upper part of this amygdaloidal horizon. The No.2 ophite band, about 20 feet in thickness, is very dense and trap-like, and lacks any appreciable alteration. No.2 amygdaloid is similar in

character to No.1 and contains "blebs" of copper in its upper part. Ophite No.3 shows more chloritic slips and carbonatization than the No.2 horizon. At its base there is a 3-inch chilled zone with specks of copper adjacent to the conglomerate. The conglomerate bed is reddish in colour and characterized by small pebbles at the top and larger ones near the base. Copper is largely confined to the upper few feet of conglomerate and occurs as disseminated fine grains at the contact and as pellets scattered throughout the sediment.

At the western shaft on the Jones location the drilling showed that the copper was confined to the upper part of a conglomerate bed. The adjoining amygdaloid was found to be barren of mineralization.

The drill logs of M.J.O'Brien, Ltd., show scattered assays with values up to 0.73 per cent copper over short core lengths.

BERENS RIVER MINES LIMITED

(NO PERSONAL LIABILITY)

25 KING STREET WEST
TORONTO 1 - ONTARIO

January 21, 1952.

**NOT TO BE REMOVED FROM
THE OFFICE OF THE RESIDENT**

Dr. J. E. Thomson,
Ontario Dept. of Mines,
Room 1404,
Parliament Buildings,
Toronto.

G. S. WILSON

SAULT STE. MARIE, ONT.

Dear Jim:

I am returning herewith the two prints showing drilling results at Michipicoten Island that you were kind enough to loan me before Christmas. I am sending you also prints of the maps that I have compiled.

Thanking you, I am,

Sincerely yours,



HSW:MKM.

H. S. Wilson.

M. J. O'BRIEN, LIMITED

CABLE ADDRESS
"GALABOGIE"
OTTAWA

HEAD OFFICE
OTTAWA, CANADA

KINDLY ADDRESS
ALL CORRESPONDENCE TO
THE COMPANY

OFFICE OF THE MINES MANAGER

900 Victoria Bldg.,
Ottawa, Ontario,
September 30, 1949.

NOT TO BE REMOVED FROM

THE OFFICE OF THE RESIDENT
GEOLOGICAL SURVEY OF MINES
OTTAWA, ONTARIO

Dr. James E. Thomson,
Department of Mines,
Parliament Buildings,
Toronto, Ontario.

Dear Doctor Thomson,-

I am enclosing herewith diamond drilling logs and reports on the Charles Jones property and, under separate cover, you will receive a roll of plans and sections detailed as follows:-

1. 1876 map of the property.
2. Longitudinal section of main shaft workings.
3. Cross section of main shaft and five levels.
4. Generalized plan and section.
5. 22 rough pencil cross sections of drill holes.
6. 2 plans showing drill hole locations.
7. 1 geological plan with drill holes - incomplete.

You will find individual parts of this data in an unfinished state but I trust you will get all you need from a study of the material in the aggregate. The pencil cross sections of individual holes are probably unnecessary but will supplement to some extent the drill logs.

The historical notes make interesting reading and you will not be surprised that we formed a favourable impression of the property on the background presented. However, the picture, as disclosed by our drilling, was substantially different as you will see by the widths and assays of the copper mineralization.

I might mention that holes 16, 18 and 20 do not appear on the attached maps. They were drilled approximately one mile west of the old workings in an area where there was some evidence of further copper but results were about the same as around the main shaft.

M. J. O'BRIEN, LIMITED

SHEET NO. 2 DATE September 30, 1949 To Dr. James E. Thomson

I am sorry the geological plan was never completed. The work was carried out during the war years when technical help was hard to get and, on the basis of the drill results, we did not find it opportune to spend any further time on the records.

We shall be glad to have all this data returned to us when it has served its purpose as we have no duplicates of most of the information.

With kind regards.

Yours sincerely,

Alan Scott
Mines Manager.

NOT TO BE REMOVED FROM
THE OFFICE OF THE DISTRICT
GEOLOGIST, CANADA
S.M. 100

AS/M
Encls.

REGISTERED

October 25, 1949

Mr. Alan Scott,
Mines Manager,
M.J.O'Brien, Ltd.,
900 Victoria Bldg.,
OTTAWA ONTARIO

NOT TO BE REMOVED FROM
THE OFFICE OF THE RESIDENT
GEOLOGIST, ONT. DEPT. OF MINES
SAULT STE. MARIE, MAN.

Dear Mr. Scott:

I am enclosing the diamond drill logs and reports on the Charles Jones location, Michipicoten Island. Under separate cover I am also returning the roll of plans and sections.

I regard this as very valuable information for our files and have taken the liberty of sending copies of the logs and reports to the office of our resident geologist in Port Arthur. We deeply appreciate your courtesy in allowing us the use of this information.

I recently told you that we are preparing a report on the lead, zinc, copper and nickel deposits of Ontario. In this report we would like to have a section covering customs smelters. Any information you could give me regarding your proposed lead smelter at Delora would be appreciated. Specifications covering the purchase of lead ores would be of particular interest. As our report will probably not be completed until late in 1950, there will be plenty of time for sending in this information at a later date when your smelter is completed.

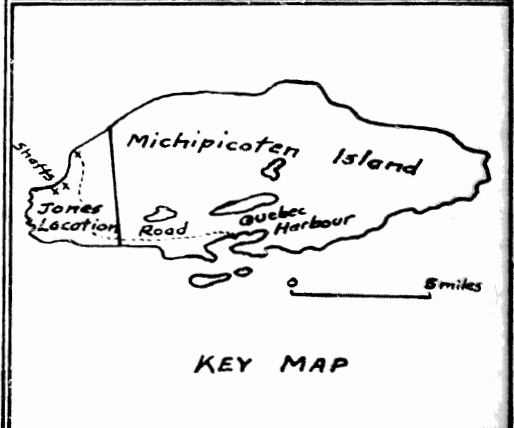
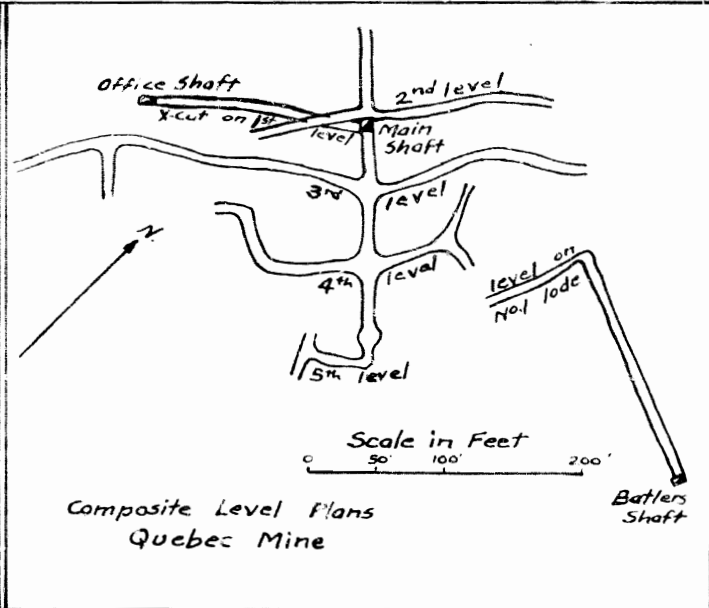
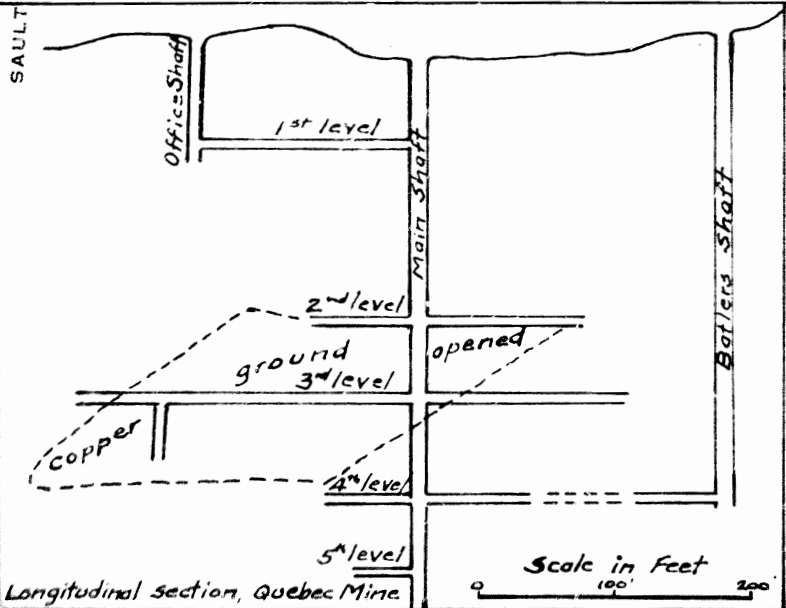
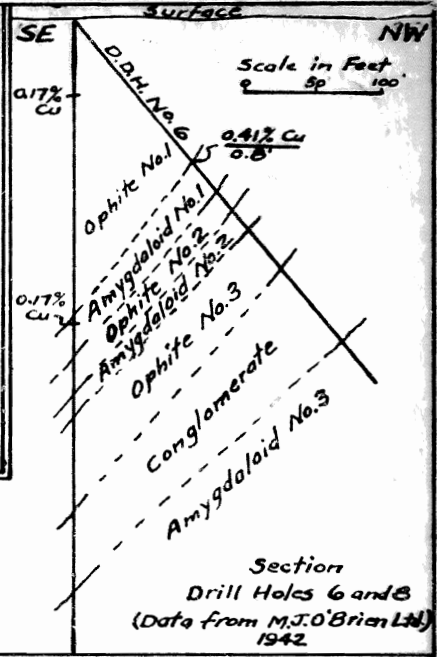
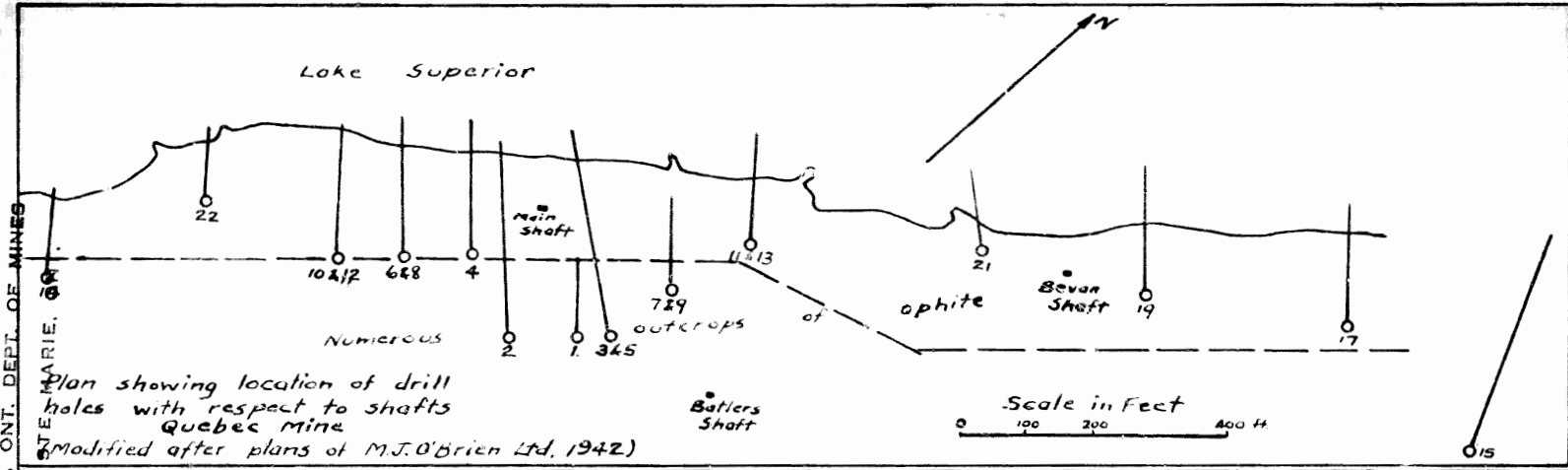
With kind regards,

Sincerely

J. E. Thomson

encs.

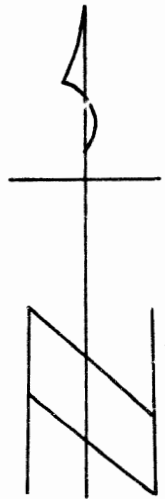
NOT TO BE REMOVED FROM THE OFFICE OF THE RESIDENT GEOLOGIST, ONT. DEPT. OF MINES



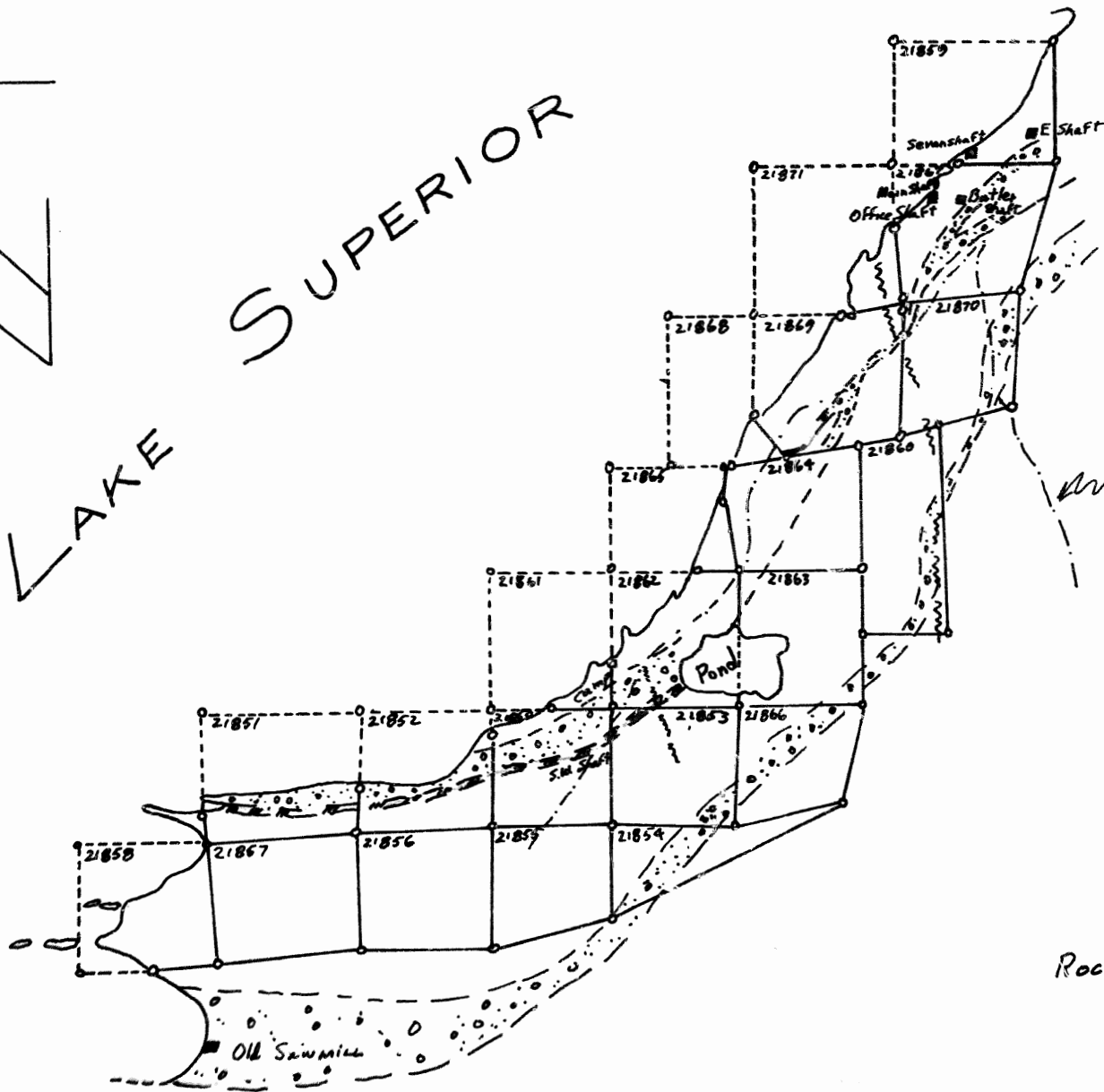
Handwritten note: A.B. This drawing is a sketch of the mine plan.

Sketch map showing the location of workings and drilling at Quebec Mine, Michipicoten Island. (Modified after plans of M.J. O'Brien Ltd. 1942) Traced by H.S.W. from print furnished by Ont. Dept. of Mines, Dec. 1951

RECEIVED JUL 1962 RESIDENT GEOLOGIST SAULT STE. MARIE




LAKE SUPERIOR



COPY
M.E.C.
March 30/65

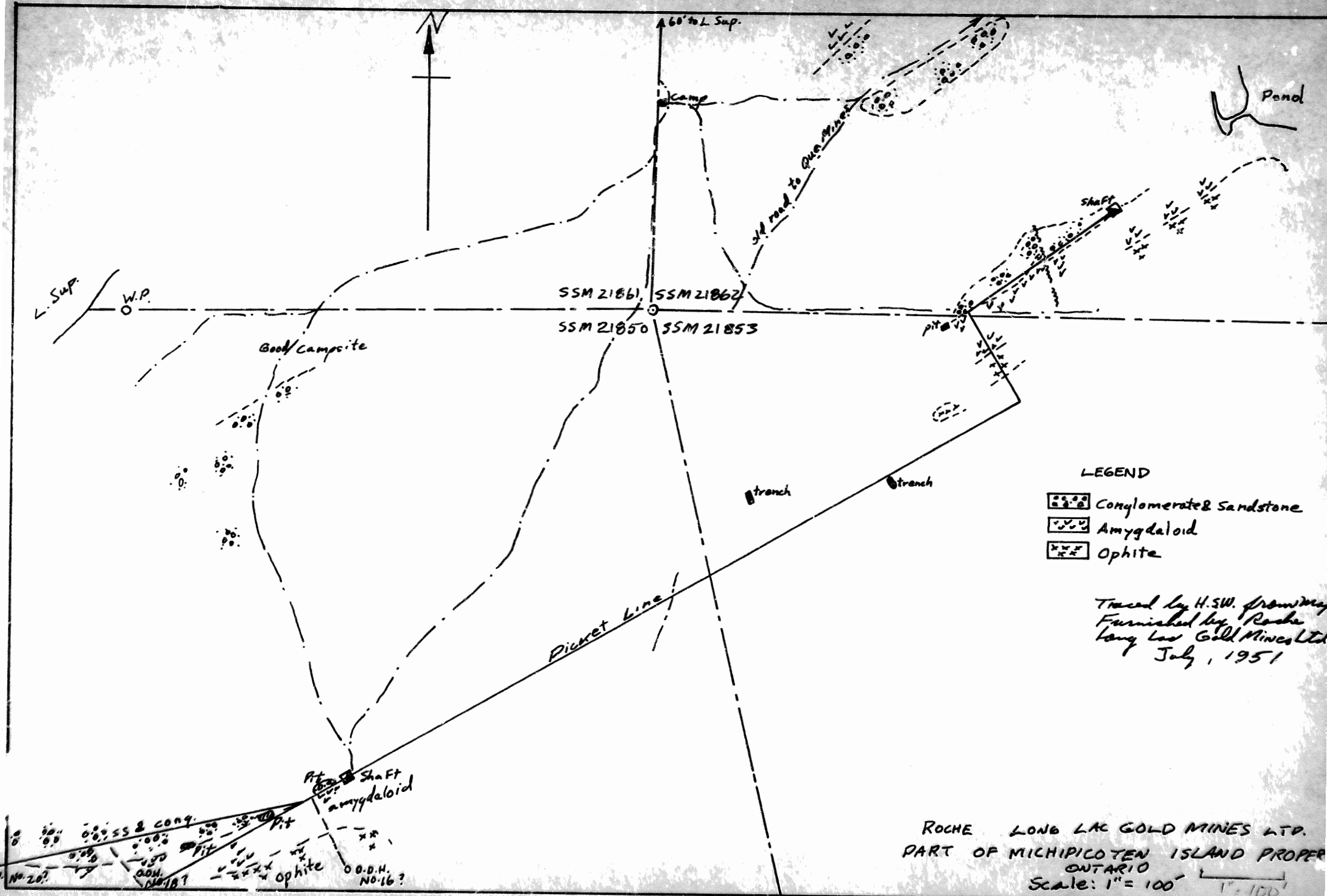
LEGEND

-  Conglomerate & Sandstone
-  Amygdaloid

Traced by H.S.W. From map furnished by Roche Long Lac Gold Mines Ltd., July 1957

ROCHE LONG LAC GOLD MINES LTD.
MICHIPICOTEN ISLAND PROPERTY
ONTARIO

SCALE: 1" = 20 CHAINS

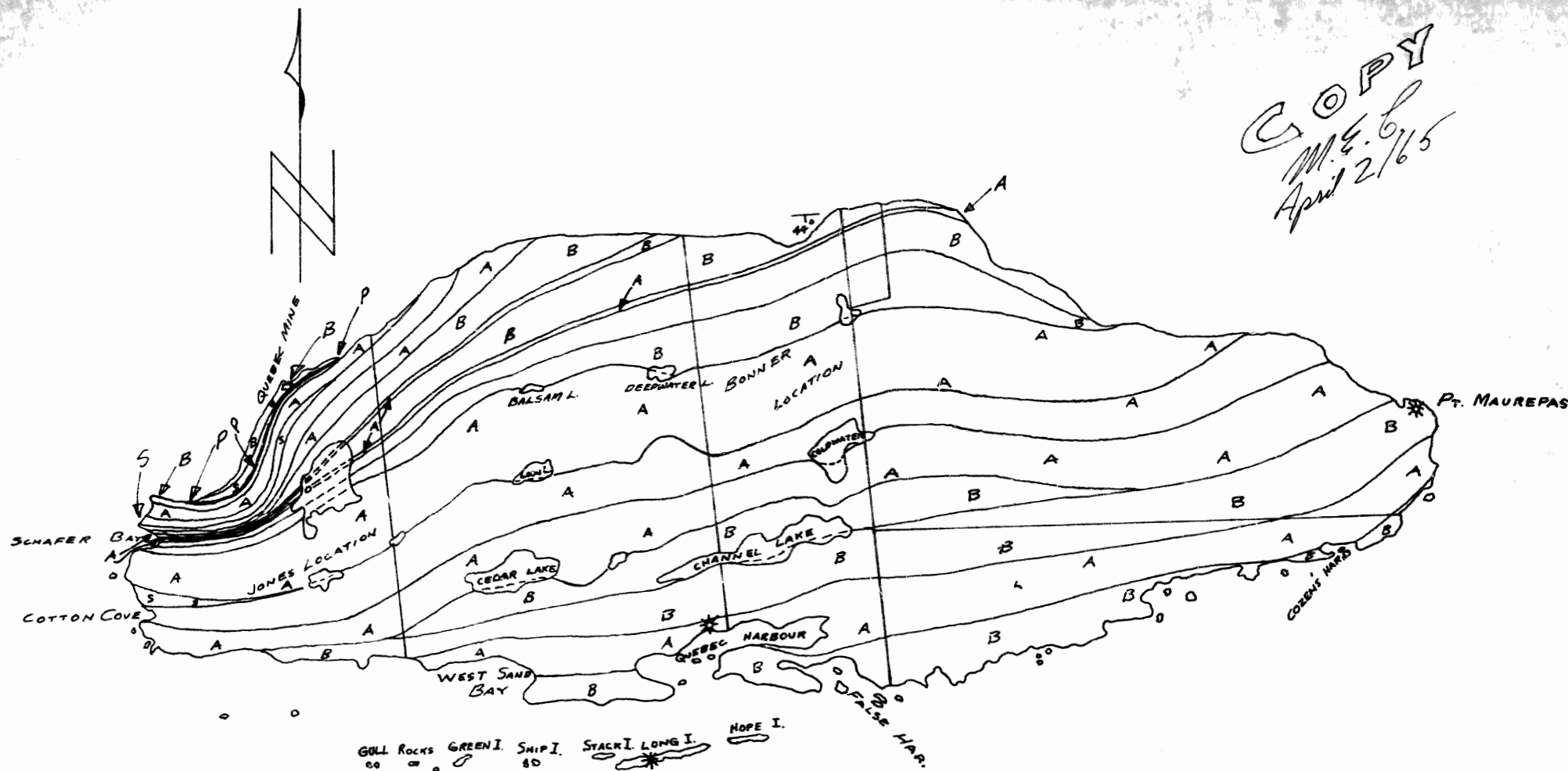


Traced by H.S.W. from map
 Furnished by Roche
 Long Lac Gold Mines Ltd
 July, 1951

ROCHE LONG LAC GOLD MINES LTD.
 PART OF MICHIPICOTEN ISLAND PROPER
 ONTARIO
 Scale: 1" = 100'

SSM-495

COPY
M.E.C.
April 2/65



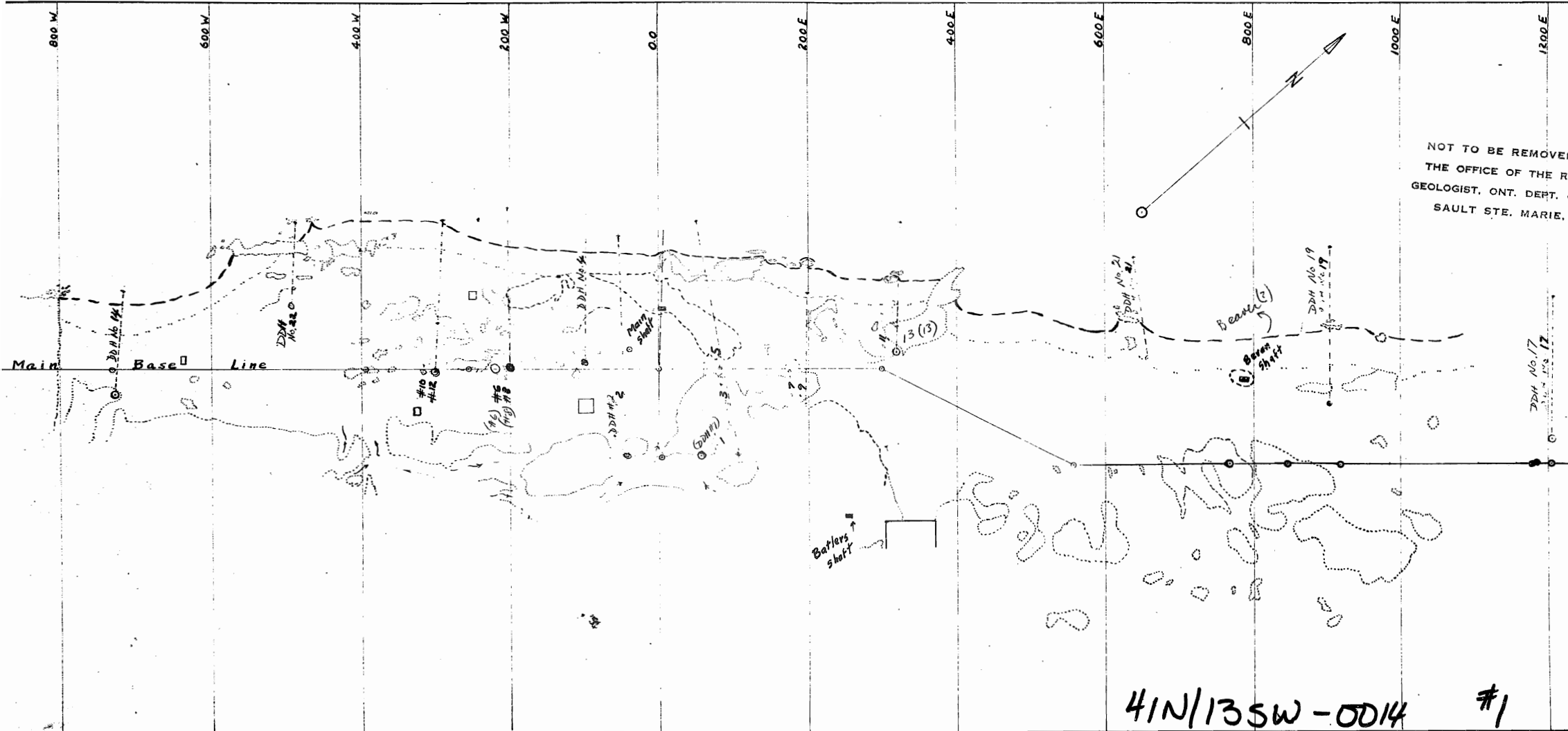
MICHIPICOTEN ISLAND.

- B Basic Eruptives (flows)
- A Acid Eruptives (")
- S Sandstones and Conglomerates
- / Pyroclastic

THREE MILES
1" = 1.33 miles (approx)

traced by X.S.W, 26 Jun 51, from photostat in possession of J.R.Rea

SSM-495

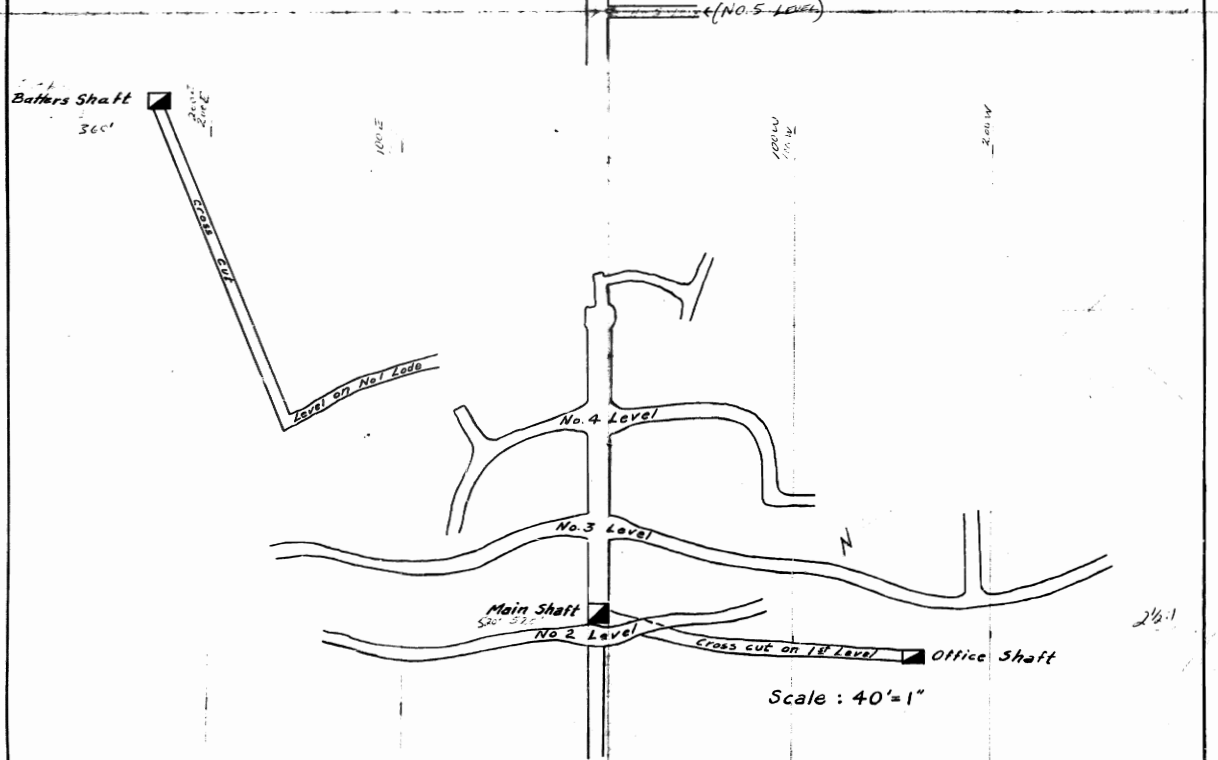
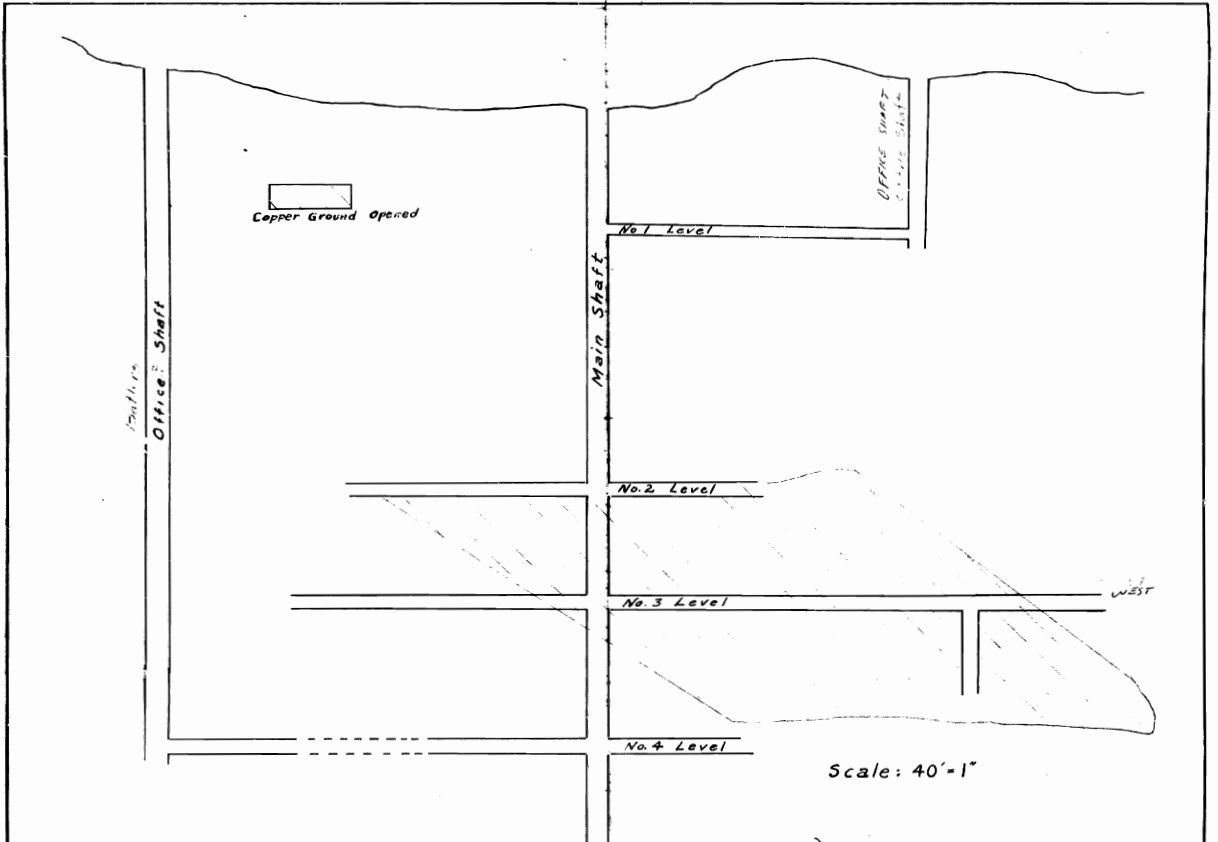


NOT TO BE REMOVED
 THE OFFICE OF THE R
 GEOLOGIST, ONT. DEPT.
 SAULT STE. MARIE.

41N/13SW-0014 #1

Scale 1" = 100'





QUEBEC MINE, MICHIPICOTEN ISLAND
 4IN/13SW-0014 #3

