BLEZARD-0015-A1

Load: 16 mm

1948

REPORT ON

THE SIR MORTIMER DAVIS PROPERTY
(SHEPPARD PROPERTY)

Blezard and Garson Townships
Sudbury Mining Division, Ontario

for The Seminole Exploration Company, Toronto, Canada

by D.C. McKechnie, Mining Engineer

This report is based on information obtained from the following sources:

1. A personal examination of the 110 foot shaft unwatered in November 1948.
2. A personal examination of the drill cores obtained from the diamond drilling by Seminole Exploration Co. and including drill holes Nos. S-3 to S-7 (shaft area), N-1 to N-8, (track area).
3. A study of the records of the aforementioned drill holes, compiled by Mr. G.F. Ennis.
4. A study of the plans and sections compiled by the engineers of Noranda Mines Ltd.
5. The glass model constructed by Mr. Ennis.
6. A study of the reports of Mr. R.W. Howe and G.F. Ennis.
7. Published reports of the geologists of International Nickel Co. of Canada, Falconbridge Nickel Mines, and the Department of Mines and Resources, Ottawa. (Refer to "Structural Geology of Canadian Ore Deposits" published by the C.I.M.M., 1948)

General

In the reports of Mr. Howe and Ennis, your company has complete information as to the area of the holdings, their location and access, and the general geology of the property, and a further repitition of

these details is here unnecessary.

Since the writing of Mr. Ennis' report, the old shaft, in the western part of the property, has been unwatered and was examined by the writer in November 1948. Following is a description of the shaft workings.

Description of shaft.

At a depth of 30 feet, rock slashes to the south-west and south-east of the shaft expose a north-easterly striking shear zone, with a vertical dip. This zone is mineralized with pyrrhotite and chalcopyrite. Two samples were taken from here which assayed:

No.1- 8.0 ft. 1.39% Ni 0.58% Cu. from S.W. corner

No.2- 3.0 " 4.31 " -- " N.E. "

At a depth of 45 feet, a drift 20 feet long has been driven north-easterly, along a narrow quartz calcite vein which strikes N 60 E and dips 35 ° to the north-west. In the back of this drift and near the shaft, this vein contains a small lens of high grade nickel-copper ore. This lens has a length of about 6 feet and an average width of about 6 inches. A sample of this ore assayed:

No.3- 0.5 ft. 5.55% Ni. 2.19% Cu.

This vein is exposed, dipping across the face of the drift, 20 feet from the shaft, but contains little sulphide minerals. The vein is also showing along the north-west wall of the drift, near the floor, but shows no signs of sulphide mineralization.

The walls around and near the bottom of the shaft, at a depth of 100 feet, were carefully examined. No signs of shearing were noted and there was little or no sulphide mineralization. Four samples were taken, one across each wall of the shaft. These all assayed nil in nickel.

Shaft

The rock exposed in the shaft can be roughly classified as a greenstone. The shaft is located about 50 feet south of the norite-greenstone contact.

In the examination of the shaft workings it was noted that the vertical mineralized shear zone exposed on the 30-foot level did not continue in the shaft below the flat dipping vein encountered at 45 feet. No mineralization or shearing of any importance was noted in the shaft from the 45-foot level down to the bottom of the shaft at a depth of 105 feet.

Old drill hole No.1 was drilled 25 feet east of the shaft, and No.2 25 feet west of the shaft. As far as I can find out no ore was encountered in either of these holes. On plan these holes should have intersected the vertical shaft shear on its projection to the north-east and south-west of the shaft.

An examination of the map sections indicate that these drill holes would pass through the projection of the shear at points below the flat dipping quartz calcite vein. It is therefore assumed by the writer that the mineralized vertical shear showing on the surface and in the upper part of the shaft is limited in depth by the flat dipping vein.

The flat dipping shear strikes N 60 E and dips 35° to the north-west, and is approximately parallel in strike to the norite-greenstone contact about 50 feet north of the shaft.

As mentioned previously, a small high grade lens of ore was observed in the flat dipping vein, along the back of the drift at the 45-foot level. This lens did not persist to the face of the drift, nor could any ore be seen in the vein along the north-west wall of the drift.

In Coleman's report of 1913 (p.79) mention is made of a shipment of high grade ore from this property, consisting of 125 tons, assaying 5.75% nickel. It appears to the writer that this ore may have been obtained from lenses in the flat dipping vein, where it crosses the shaft, from the 45-foot level drift, or from open cuts on the surface to the south-east of the shaft, where the vein could be expected to outcrop.

Mineralized zone-shaft area:

With the information obtained from the examination of the shaft workings, and a study of the plans, sections, and drill logs, the writer has endeavoured to work out the structure of the orebodies which have been intersected by the different drill holes in this vicinity. This interpretation is illustrated by the plan and sections attached to this report (Maps 1 and 2).

In the reports of Mr.Howe and Mr.Ennis, it has been assumed that there are two ore zones, the shaft zone and the north zone. Mr.Howe suggests that the zones may join in the vicinity of D D H.19.

It is the writer's opinion that the two zones are connected and that they form essentially one ore body.

Ore structure-shaft area:

Dip - Refer to sections on map No.1
In the vicinity of the shaft and near the surface the orebody dips flatly to the north, towards the norite-greenstone contact. At a depth of from 50 to 100 feet the dip steepens and continues to depth at dips steeper than that of the contact. The dip of the zone appears to vary between vertical and 70° to the north.

Strike - See plan, Map No.2
A projection of the ore zone at a vertical depth of 150 feet indicates a strike of N 72 E at that level, which is in general parallel to the norite-greenstone contact.

Rake - Howe suggests in his report that the orebody has a steep rake to the east. The available evidence appears to support this supposition.

Horizontal length: - Drill hole intersections indicate that the orebody has a probable minimum length of between 200 and 250 feet. At the 150 foot level the east end is somewhat west of D.D.H. 8 as only low grade mineralization was encountered in hole 8, and in hole No.10, farther to the east. To the west D.D.H. 4 (50' W of 14 and 16) did not encounter ore. It is possible however that Hole 4 is entirely in the footwall of the ore zone, and that zone may have a somewhat greater westerly extension.

Depth - The deepest intersections showing ore are in drill holes 4C and S-3, where ore is shown at a vertical depth of 430 feet below the surface. There are no drill holes which limit the ore to this depth.

Metal content - The best mineralized vertical section is that to the west (see map No.1), and intersected by drill holes 2, 3, 14, 16, 4A, and 4C. The average width shown in this section is 6.3 feet with an average grade of 1.80% nickel and 0.50% copper, for a vertical depth of 240 feet. D.D.H. 61 has apparently not been drilled deep enough to intersect the ore at this section.

Four additional holes- S-3, 19, 6C, and 9, have intersected the ore zone to the east of the west section. These holes show an average grade of 1.05% nickel and 0.70% copper, across an average width of 5.7 feet.

The average value of all intersections on the ore zone, for a horizontal length of 200 feet, and to a vertical depth of 430 feet, gives a width of 6.0 feet, with a metal content of 1.40% nickel and 0.60% copper.

Owing to the uneven spacing of the drill holes intersections an accurate calculation of the overall grade is not possible, but it appears likely that a grade of between 1.40% and 1.70% nickel and 0.60% copper can be anticipated.

Ore estimate- Assuming a strike length of 250 feet, and an average width of 6.0 feet, there is an indicated amount of 135 tons per foot in depth or a total of 67,500 tons to a depth of 500 feet, with an estimated grade of 1.55% nickel and 0.60% copper.

Mineralized Zone- Track Area GARSON TP

In the reports of Mr. Howe and Mr. Ennis your company has a good and complete description of this mineralized ore zone and there is really little that the writer can add except to point out certain geological features which may aid in further exploration for extensions of the known orebody, or the discovery of new ones.

With regard to the recent drilling carried on by the Seminole Exploration Company Mr. Ennis states in his report and I quote:- "The drilling of these holes did not materially extend the known limits of the orebody, but did more accurately determine the structure of the ore zone and the general shape of the orebody and these new outlines aided considerably in the tonnage calculation

The writer has recalculated the ore position and submits the following ore estimate within the limits shown:

Strike limits - 1100 feet, between line 7400 E and 8500 E.

Depth - Maximum depth 400 feet or to an elevation of 500 feet.

Average width - 11.5 feet

Tonnage - 370,000 tons (using 11 cu.ft per ton)

Nickel content - 1.44%

Copper content - 0.60%

This estimate is in essential agreement with that made by Mr. Howe. In his report Mr. Ennis has made a somewhat higher estimate. This is partly accounted for by the tonnage factor of 10 used by Mr. Ennis. If this factor is used the writer's tonnage estimate would be increased by about 9% or to a total of 400,000 tons. The factor of 11 cubic feet per ton is probably on the conservative side.

The aim of further exploration will be to extend the known ore zone and to find additional orebodies. The important question is, where to conduct this work?

Before going into reasons for his opinions on this matter the writer suggests that the most favourable place to locate additional ore is immediately below the intersections in Drill Holes 70, 69, and N-2 (between lines 7450 E and 7650 E, elevation 500 feet) and immediately to the west thereof (see Long.Sect.. Map 3). A drill hole with a maximum length of 1,000 feet would reach this area from the surface.

General Geology and Structure:

The geology of the property has been well described by R.W. Howe in his report, and for convenience I repeat his description:

" The part of the property mapped and drilled is a contact zone which strikes roughly east, and is intrusive norite to the north and the older greenstone-hornblendite-sediment complex to the south. The contact dips flatly north at the western edge of the property, and becomes vertical east of the shaft and dips steeply south and north at various points across the property. It also changes its dip with depth."

" Irregular bodies of granite penetrate both the norite and the older rocks. Generally parallel to the contact are dykes of a noritic rock. There are many small diabase dykes."

"The contact from the shaft to the eastern boundary is a fault zone or an intensely sheared zone. The drill cores show fault brecciation in many places. Like most fault planes its surface truncation is not a straight line, but undulates both horizontally and in dip. The dip of the fault contact varies from 55° north to 71° south."

" The governing influence over ore deposition in both the track and shaft deposits has been a flattening and steepening of the dip of the contact zone, and its local change of strike. The frequence and pattern of the rolls and bearing points in the fault plane is not known and may vary. In places the

' drilling has shown mineral in the norite-greenstone contacts and the norite-hornblendite contacts, the greenstone-hornblendite contacts, and the granite-greenstone contacts, and in places mineral has replaced all these classes of rock."

" No crush breccia was seen along the contact. There are lenses of what has been termed "norite" dykes, paralleling the contact. It is possible that these are fine grained quartz diorite. Some of the dykes have been quite well mineralized and, near the east boundary of the holdings, may have been the cause of the wilder variations of the magnetic readings."

General Geology

It has been definitely established that the norite-greenstone contact, from the Garson mine west to the Sheppard shaft, is a faulted and sheared zone. Similarly, the important structural feature of the Falconbridge mine, farther to the east, is the presence of a strong fault or shear zone along the norite-greenstone contact. Evidence to date indicates that movement along the fault zone has been oblique, with the north side moving upward and in a westerly direction.

On the Sheppard property the available evidence points to the same conclusions as at Falcombridge, that the movement of the north side is upward and to the west. This fact has an important significance in the localization of the orebodies. This is illustrated in the accompanying sketch.

It will be seen from the vertical section on the sketch that where the faulted and sheared contact dips to the north, and where the north side has moved upward, that the zone of increased permeability, and therefore the most favourable position for the localization of orebodies, is along the

flatter dips, with the ore tending to narrow and die out along the steeper sections of the contact. This appears to have been proved in the track orebody, and is well illustrated in the easterly part of the mineralized zone, where wide concentrations of ore occur along and near the flatter dipping areas of the contact.

Where the fault has a horizontal movement, changes in strike have a similar but probably less pronounced effect on the localization of the orebodies. This condition has been found at Falconbridge and I quote from Mr. Davison's report on that mine recently published by the C. I. M. M.:

> " The "Western Swell" is fairly typical of the ore shoots localized where a change of strike of the norite and the contact fault gave rise to a wide zone of ore mineralization. Here the contact swings over a length of 350 feet, from an east-west direction to slightly south of west. With the north side of the fault moving west relatively to the south, increased permeability would be expected, and consequently the orebody is relatively wide."

Where an embayment of the norite into the fault zone occurs due to changes in either dip or strike, it would be natural to expect that this norite would be somewhat sheared and mineralized, particularly if near a known mineralized contact zone.

One such location appears to have been definitely found in the track mineralized zone. In drill hole 69, on section 7500 E, and at elevation 550 ft. there is an intersection of a wide zone of sheared and mineralized norite, on the contact. This zone is 34.7 feet wide and ran 0.35% nickel and 0.31% copper.

One hundred feet to the east, and at an elevation of 480 feet, drill hole N-2 intersected 11.2 feet of mineralized norite on the contact, which ran 0.48% nickel. In the immediately adjoining quartz diorite there is a further mineralization which ran 0.35% nickel and 0.41% copper, and a further 6.8 feet in the greenstone which ran 0.43% nickel and 1.93% copper.(see map 4)

The horizontal projection of the contact in this vicinity shows a definite change in strike.(See map 3)

It is of further significance that 50 feet west of drill hole 69, and on section 7450 E, drill hole 70 cut an 18.1 foot section which ran 2.54% nickel, of which 13.7 feet ran 3.21% nickel.

As has been mentioned before, the frequence and pattern of the rolls and bearing points in the fault plane is not known and may vary.

It appears from the evidence in drill holes 69, 70, and N-2, that a roll or bearing point may be present in the near vicinity of this section of the mineralized zone.

From this point to the surface, a distance of 450 feet, the dip of the contact is steeply north. There is a reasonable possibility that a flattening of the dip may occur at a not too great distance below these aforementioned intersections. This area of flatter dip would be a favourable point for the localization of a substantial orebody.

I have illustrated this possible condition on an attached sketch, with the suggested location of an initial drill hole, which would have a maximum length of 1,000 feet.

In drill hole 71, at line 7300 E and elevation 430 feet, an intersection shows 2.2 feet which runs 2.3% nickel. This is well out in the greenstone and is not connected directly with the contact mineralized zone.

The ground is therefore open for an extension of the mineralized zone at the 500 ft. elev. horizon for at least 300 feet to the west, and there are no drill holes down the dip which would limit the ore occurrence.

It can be expected that the dip of the norite-greenstone will again flatten below the presently known ore limits, and thereby produce conditions favourable for the localization of substantial ore bodies. The writer has already suggested a place where such a change may be imminent.

To further explore the downward dip of the contact zone, the writer recommends drill holes of gradually increasing length, say of 1,200 or 1,500 feet, rather than the immediate drilling of deeper holes of 2,000 or 3,000 feet.

To start with, the first three holes should be located to intersect the contact between lines 7300 E and 8400 E, the presently known horizontal limits of ore deposition in the track orebody.

I am of the opinion that further exploration work on the property is well justified, and recommend that the first work be confined to probing the downward extension of the track mineralized zone.

The writer is only casually acquainted with the results on the parts of the property other than the track and shaft

mineralized zones, and is therefore expressing no opinion as to their ore possibilities.

Respectfully submitted

"D.C. McKECHNIE"

Mining Engineer

Sudbury, Ont.
December 31/48

Shepherd Mine

REPORT ON THE SIR MORTIMER DAVIS PROPERTY, BLEZARD AND GARSON TOWNSHIPS, SUDBURY MINING DIVISION, ONTARIO, for THE SEMINOLE EXPLORATION COMPANY, Toronto, Ontario, by G. F. ENNIS, MINING ENGINEER.

SUMMARY

1. Commercial deposits of copper and nickel so far discovered in the Sudbury District are confined to the periphery of the Sudbury Nickel Eruptive or to offset dikes and sills of the Eruptive which parallel the contacts, or major structures in the adjoining rocks. The major producing mines within the contact zone of the Nickel Eruptive are associated with embayments of norite in the footwall rocks, and faults in or near the contact, or both.

Previous Work

2. Prior to the year 1892 a shaft was sunk to a depth of 110 feet on a lense of ore which occurs in the greenstone rocks approximately 70 feet south of the norite-greenstone contact on the south part of Lot 1, Con.III, Blezard township. Approximately 125 tons of ore were mined and shipped. The ore had an average nickel content of 5.75% and an average copper content of 0.35%.

3. In 1928 four diamond drill holes were put down in the vicinity of the shaft by Sir Mortimer Davis Incorporated. Some ore was encountered over narrow widths, but no tonnages were outlined.

4. In 1937 and 1938, Noranda Mines Limited conducted a

detailed geophysical and diamond drilling program along the norite-greenstone contact zone. The drilling involved a total of 20,966 feet.

5. The diamond drilling at the shaft outlined two lenses of ore. The one in which the shaft was sunk comprises 50,000 tons having a nickel content of 1.68% and a copper content of 0.20%. The other lies approximately 70 feet north of the shaft in the norite-greenstone contact and comprises a total of 15,000 tons having a nickel content of 1.45% and a copper content of 0.36%.

6. The geophysical survey east of the C.N.R. track, which crosses the property, indicated mineralization for a distance of 800 feet east from the track. The anomalies were tested by 36 diamond drill holes which outlined an orebody 1000 feet long and 350 feet deep, having a total of 350,000 tons with an average nickel content of 1.41% and an average copper content of 0.52%. No estimate of the precious metal content was made, but a value of $1.00 per ton was applied to all of the ore.

7. Diamond drilling east of the track orebody did not encounter any ore, but some mineralization was found in the norite-greenstone contact and in the greenstones.

8. Diamond drilling west of the shaft has not disclosed any ore to date. Only very shallow holes have been drilled in this area which should be explored below the 500 foot horizon.

Drilling by the Seminole Exploration Company:-

1. Diamond drilling at the shaft comprised 3,776 feet. The drilling consisted of 5 holes. A total of 5,903 feet of drilling was done along the track area and 1,638 feet of

drilling was done on the south part of the property along the south contact of the greenstones.

2. Only one of the 5 holes drilled at the shaft encountered ore. Hole S3 cut 1.8 feet of sulphides assaying 1.18% nickel and 3.62% copper. This intersection confirms the extension of the ore by the Noranda drilling to a depth of 600 feet. It assists in computing a tonnage for the lense of ore at the shaft of 60,000 tons having a nickel content of 1.74% and an average copper content of 0.36%.

3. The tonnages of the ore in the north lense at the shaft were recalculated. A total of 22,000 tons having a copper content of 0.20% and a nickel content of 1.45% are indicated.

4. Four of the 8 diamond drill holes put down along the track orebody encountered ore, but did not materially extend the ore projections except to outline the known ore in more detail.

5. The Noranda and Seminole Exploration Company drilling outlined approximately 450,000 tons of ore in the track area having nickel content of 1.76% and a copper content of 0.74%. The platinum metals will average 0.029 ounces per ton.

6. On the south part of the Davis property 2 diamond drill holes (S-1 and S-2) were drilled across the high readings of a magnetic survey made during the fall of 1947. The hole cut the greenstone-sedimentary contact and a dike of lightly mineralized quartz diorite which forms a narrow gossan on surface. No nickel, copper or precious metal values of economic importance were encountered.

PROPERTY AND LOCATION

The properties under option to the Seminole Exploration Company comprise the following:

Lot 2, Conc. II, Blezard Township
Lots 1 and 2, Conc.III, Blezard Township
Lots 11 and 12, Conc.III, Garson Township —

McGinn option: Unpatented. Work due in 1948
The north 1/2 of Lot 12, Conc.II, Blezard Township.

Russell Estate option: Patented from the Crown
North 1/2 Lot 12, Conc II, Garson Township

ACCESS

The main line of the C.N.R. crosses the property near the west boundary of Lot 11,Concession III, in Garson township. The property is also accessible by a winter road which follows the C. N. R. track from the Garson township road, a distance of 2 miles. Another road runs into the property from the Capreol-Sudbury highway to the west, but this road cannot be used until a bridge is repaired or reconstructed over a creek about 1 mile from the highway.

TOPOGRAPHY

West of the C. N. R. tracks the greenstone outcrops are in high relief, forming a bluff which lies along an east-west direction and slopes to the north and south. The norite outcrops are in generally low ground to the north of the greenstones and this area is mostly swamp covered.

East of the C. N. R. tracks, the norite-greenstone contact is in low swampy ground. The norite and greenstone rocks form ridges from 10 to 30 feet high to the north and south of the contact.

VEGETATION:-

Fires and early roasting of sulphides in the nickel

district have reduced the vegetation to scattered scrub poplar and spruce. Most of the high outcrops are bare, particularly on the greenstone ridges.

GENERAL GEOLOGY

The Sudbury Nickel Eruptive is a distorted eliptical-shaped extrusive. The center of the extrusive has dropped to form a basin over which sediments were deposited. The exposed rim of the nickel eruptive is composed of norite on the outer edge. The norite grades through a transition zone to micropegmatites in the center of the rim. The contact of the norite and the country rocks dips with varying angles toward the center or core of the nickel eruptive.

The major ore deposits of the district are directly associated with the norite, either along the faulted and folded areas of the contact or in offset deposits in which the host rock is quartz-diorite, a fine grained phase of the norite.

The Frood and Stobie mines are located on an offset sill of quartz-diorite and intrusive breccia. Garson and Falconbridge mines (see attached structural map) are located along mineralized faults which follow the norite-greenstone contact. The structural control at the Creighton mine is a fault intersection with the norite-granite and greenstone contacts.

GEOLOGY OF THE DAVIS PROPERTY

The Davis property overlies approximately two miles of the norite-greenstone contact along the south rim of the nickel eruptive and midway between the Stobie and Garson mines (see attached structural map). The contact is covered by overburden over most of the property. It strikes almost east-west through Lots 1 and 2 in concession III, Blezard township, and lots 11 and 12, concession III, Garson township.

The Keewatin greenstones in contact with the norite to the south, comprise a belt of flows which strike nearly east-west across the Davis, McGinn and Russell properties. The greenstones have been intensely folded with the axis of the folding parallel to the strike of the flows. On the Davis, McGinn and Russell properties, the south edge of the greenstone is in contact with a belt of sediments, the age of which is not definite, but is probably later than Keewatin. A dike of quartz-diorite from 20 to 40 feet wide follows the greenstone-sedimentary contact. It is mineralized and shows as a zone of gossan on surface. In the sediments and greenstones to the south of the major greenstone-sedimentary contact, a number of irregular dikes of "frood" breccia occur. Most of these dikes have some mineralization.

The norite and quartz-diorite have been definitely established as the host rocks for the deposition of nickel and copper in the Sudbury area.

The structural control on the Davis property along the norite-greenstone contact is a fault which follows the contact

from a point west of the shaft through the east boundary of the property. There are two faults noted on the attached structural map, the A fault and the B. fault. The A fault is the one above-described. The location of the B fault has not been definitely established. There is evidence that the two faults join somewhere between lines 9,000 and 10,400 east (see surface geological plan), The magnetic anomalies between these lines, and particularly between lines 9,900 east and 10,400 east, indicate the presence of branch faulting with associated mineralization.

ORE OCCURRENCES

Between the years 1890 and 1892 a shaft was sunk to a depth of 110 feet on a lense of nickel and copper-bearing sulphides which lies approximately 70 feet south of the norite-greenstone contact in Lot 1, concession III, in Blezard township. The ore in the lense is mostly massive sulphides with a high nickel and low copper content. Approximately 125 tons of ore were shipped from the shaft. The nickel content averaged 5.75% and the copper content averaged 0.35%.

In 1928, 2154 feet of diamond drilling, comprising 4 holes, was done at the shaft by the Sir Mortimer Davis Incorporated. Some ore was encountered over narrow widths, but no tonnages were outlined.

No additional ore was located around the shaft until Noranda Mines Limited obtained an option on the property in 1937 and conducted a detailed magnetometer survey along the norite-

greenstone contact and followed it with an extensive diamond drilling program. They drilled 19 holes around the shaft in an effort to outline the lense of ore in which the shaft was sunk. Of these holes, 17 were drilled above the 300 foot horizon and 2 intersected ore on approximately the 600 foot horizon.

The Sir Mortimer Davis and the Noranda diamond drilling located and partially outlined two lenses of ore at the shaft; the one in which the shaft was sunk and one to the north of the shaft in the norite-greenstone contact.

The lense of ore at the shaft strikes approximately N60E and appears to dip at approximately 70° to the north. The diamond drilling confined this lense of ore to a length of 200 feet although a possible length of 400 feet was indicated in the Sir Mortimer Davis drilling. The depth of the lense is apparently limited to less than 600 feet. Above the 50 foot horizon, ore occurs across from 30 feet to 40 feet, but below the 50 foot horizon, the average width is approximately 6 feet. In the shaft, the ore showed a very high nickel content and a low copper content. In hole No. 4c, drilled by the Davis Estate, the ore encountered assayed 1.74% nickel and 0.62% copper over 13.5 feet. The assays from this hole could be taken as the approximate average for the whole lense.

Under the writer's direction, the Seminole Exploration Company drilled 2 holes through the shaft area to check the intersection in hole No. 4c (see section). Hole No. S3 cut

this same ore lense approximately 25 feet east of Hole 4c. The intersection was narrow, but was composed of massive sulphides and quartz which assayed 1.18% nickel and 3.62 copper over 1.8 feet.

Hole No.2c was drilled 200 feet west of 4c by the Sir Mortimer Davis Estate; it cut apparent westward extension of the shaft ore at a vertical depth of approximately 500 feet. The intersection was only 1 foot wide, but assayed 0.12% nickel and 3.32% copper.

Hole No. 6c was drilled frmm a location 400 feet east of 2c by the same company and to a depth of 612 feet. Ore was intersected from 368.5 to 375 feet which assayed 0.62 nickel and 1.38 copper. This intersection was in the greenstones and appears to be part of the shaft ore.

The intersections in Holes 2c and 62 are 400 feet apart, but because of the long lateral projection, the length of the shaft ore is confined to 200 feet.

The north lense of ore at the shaft was outlined by the Noranda drilling in Holes 2, 3, 14, 16, 17, and 19. Hole No.4 to the west and Hole No.9 to the east did not encounter any ore which confines the length of the lense to a maximum of 160 feet. Hole No.S3, drilled by Seminole Exploration Company, did not cut any ore on the norite-greenstone contact so limits the lense to a depth of less than 500 feet. A depth of approximately 400 feet is indicated.

Both possibilities of eastward and westward rakes to these ore lenses were checked by the Seminole Exploration Company drilling

in holes S3, S4, S5, S6, and S7. These holes comprised a total of 3776 feet of drilling. All of the holes explored the mineralized zone below the 450 foot horizon. The only holes which intersected ore of commercial grade were S3, and S7. S3 cut 1.8 feet of sulphides from 588.0 to 589.9 feet which assayed 1.18% nickel and 3.62% copper. At the present price of copper and nickel, this intersection will grade mineable ore over 4 feet which definitely extends the shaft ore to a depth of 500 feet.

Hole No. S7 intersected quartz and sulphides from 497.5 to 500.3 feet. However, the sulphides were ground out of the core except for approximately 1/4 inch of massive pyrrhotite and chalcopyrite which was not enough for accurate assay.

In computing the tonnages in the two lenses of ore at the shaft, an average width of 6 feet was used for the ore in the shaft lense and an average width of 5 feet was used for the north lense of ore in the norite-greenstone contact.

For the shaft ore, with a length of 200 feet, a depth of 500 feet, and an average width of 6 feet, a total of 60,000 tons of ore are obtained. The gravity factor is 10 cu.ft.per ton. The grade of the shaft ore is 1.74% nickel and 0.36% copper. An average platinum content of 0.029 ounces is assumed.

For the north ore lense, an average width of 5 feet, length of 150 feet, and a depth of 300 feet. Using these figures and a gravity factor of 10 cu.ft. per ton, a total tonnage of 22,500 tons is involved. The precious metal content is assumed

to be 0.029 ounces of platinum metals.

At the present prices of the metals involved, the shaft ore will grade $15.34 per ton and the north lense will grade $12.56 per ton. The following prices of the metals were used in the calculations: copper 21.5¢ per pound; nickel 34¢ per pound; platinum $89.00 per ounce.

TRACK AREA-

The geophysical survey carried out by Noranda outlined magnetic anomalies which suggested mineralization along the norite-greenstone contact for a distance of 800 feet east from the C. N. R. track (see surface geological and magnetic plan). The magnetic anomalies were examined by 36 diamond drill holes which outlined an orebody 1000 feet long and approximately 350 feet deep. The mineralizing solutions appear to have been localized by the intense folding both laterally and vertically, and faulting along the norite-greenstone contact.

East of Line 8200 E (see plan) the orebody dips at approximately 55° north to the 200 foot horizon then steepens abruptly to an almost vertical dip from that level to the present limits of the drilling at approximately the 400 foot horizon.

From the 8200 E line, to the westerly known limits of the drilling at Line 7450 E the dip is fairly uniform at from 70 to 80 degrees to the horizontal.

No ore was encountered in the Noranda drilling west of Hole No.70 which is located on Line 7450 E. The last hole drilled on the track orebody was No.71 from the same set up as Hole No.70 and on a line S20W.

The Seminole Exploration Company drilled holes Nos. N 1 to N 8 along the orebody in an attempt to extend the ore west from Hole No.70 and below the 400 foot limits of the previous drilling. The eight holes comprised a total of 5,903 feet and was carried out under the direction of the writer. The deepest hole drilled was N 1 which reached a depth of 1,407 feet and cut the norite-greenstone contact at a vertical depth or 1,000 feet. The shortest hole drilled was N 5, which was drilled to a depth of 358 feet and cross-sectioned the orebody at approximately the 200 foot horizon.

Of the eight holes drilled, four holes encountered ore of commercial value. These holes are shown on the accompanying sections and are described in the attached logs and assay records.

The drilling of these holes did not materially extend the known limits of the orebody, and did more accurately determine the structure of the ore zone and the general shape of the orebody and these new outlines aided considerably in the tonnage calculations.

Holes N 5, N 6, and N 7,(see section) were drilled to outline in detail the ore through one section and the attitude of the norite-greenstone contact. The geological evidence from these holes suggest that with the steepening of the norite-greenstone contact, the ore pinches out rapidly. The almost vertically dipping portion of the contact lies within the fault zone and the localizing influences on the mineralizing solutions have apparently been eliminated. Copper and nickel sulphides occur as fine disseminations in silicification throughout the

steep dipping sections of the sheared norite-greenstone contact, but not in commercial amounts.

It is reasonable to assume that the norite-greenstone contact will flatten in dip again below the present ore limits and ore conditions similar to those above the 200 foot horizon should occur.

No drilling has been done to date which definitely limits the ore to the present horizon. The ore cut in Holes 62 and 70 appear to continue beyond the 500 foot level and may be continuous to considerable depths around these sections. These two ore shoots may not have any eastern or western rake, but may continue directly down the dip of the axis of the folds along the contact.

The intense magnetic anomalies from Line 9000 E to the east boundary of the property suggest heavy mineralization associated with the possible intersection of the A and B faults. Noranda drilled some flat holes to very shallow depths through the anomalies which were outlined along the norite-greenstone zone. They show the contact to be dipping south (see sections). It is my belief that further drilling to deeper horizons and through the south limits of the magnetic anomalies will reveal ore within the juncture of these faults. The fact that the norite-greenstone contact is dipping south may indicate the presence of structural conditions similar to those at the Carson mine, where two ore chimnies occur along two parallel faults which converge at depth to form one continuous body.

ORE ESTIMATES

A glass model was made of the orebodies at the track and shaft area and the information derived from the model assisted considerably in making the following ore estimates.

The enclosed composite plan of the ore outlines on the 100, 200, and 300 foot horizons was also used as a guide in the calculations of ore tonnages.

The following are the ore estimates for the track orebody:

Length of orebody	...	1000 feet
Width "	(average)	12 "
Average depth		375 "
Copper content		0.74%
Nickel "		1.76%
Platinum metals		0.029 oz
Cubic feet per ton		10. oz

Applying the above figures to the track orebody, a total of 450,000 tons are obtained which grade $17.50 per ton. Assuming a total recovery of 80% of this ore, this figure would be reduced to $14.00 per ton. Prices of metals used are: Nickel 34¢ per pound; copper 21.5¢ per pound; platinum $89.00 per ounce.

Noranda's estimates applied an assumed value of $1.00 for the precious metals. A check assay of the composite ore section in Hole No.30 gave 0.048 ounces platinum and the average platinum content in Hole N 5, which was drilled directly below No.30, was 0.029 ounces. This latter assay is applied as an average for the whole orebody.

Summarizing, the total ore outlined on the property to date involves 532,500 tons; 82,000 tons in the shaft area, and 450,000 tons in the track area.

The recovery of these ores would involve the sinking of two

500 foot shafts at a cost per foot of approximately $140.00 or 30¢ per ton. An estimate of the cost of recovery of the ores is as follows:

Sinking of two 500 foot shafts ...	$0.30	per ton
Development of the ore	1.50	"
Mining	1.50	"
Concentrating and smelting	5.00	"
Total per ton cost	$8.30	

Actual costs will probably be higher than the above estimate. The total costs at the International Nickel Company as computed from their annual report is approximately $9.60 per ton. However, it is reasonable to expect that even with the cost of $9.60 per ton, a profit of at least $3.00 per ton can be realized from mining the present ore.

MC GINN PROPERTY

During the summer of 1947 a detailed magnetic survey was made over the McGinn property. An accurate hand dip needle was used. The survey also covered the south part of the Davis property. Since no drilling was allotted for the McGinn property, two diamond drill holes were put down on the Davis property (see map) across the magnetic highs of the anomalies which were outlined along the mineralized quartz-diorite dike and the spherulitic edge of the greenstones. These holes failed to encounter any mineralization of economic importance.

On the McGinn property a gossan has been exposed by stripping for a length of approximately 300 feet. It outcrops at intervals to the west across the Davis property. The mineralization occurs in quartz-diorite which is in contact with greenstone on the north and sediments on the south. The strike of the quartz-diorite is

approximately N 65 E. The dip appears to be almost vertical. The quartz diorite is cut by numerous white crystalline quartz veins which vary in width from a few inches to three feet. Mineralization occurs as heavy pyrite and marcasite with small amounts of chalcopyrite and pyrrhotite. No nickel, copper or precious metal assays have been taken from the mineralized zone which would indicate commercial amounts of any of the metals.

Other greenstone flows occur on the McGinn property south of the quartz-diorite dike. These flows are in contact with sediments which have been cut by irregular dykes of "Frood Breccia" carrying some mineralization. These mineralized dikes south of the quartz-diorite would have to be studied carefully and mapped in detail before any conclusions could be drawn about their commercial ore possibilities.

The absence of any commercial values in the drilling on the Davis property does not offer much encouragement for the potentialities on the McGinn property.

Under the terms of the McGinn option, a cash payment of $5000.00 is to be made to McGinn if the option is taken up and 100,000 shares of stock in a company to be formed on the Davis property is to be allotted to McGinn. In view of the results of the drilling on the Davis property to date along the extension of the mineralized zone on the McGinn property, such an expenditure cannot be recommended.

Two diamond drill holes on the McGinn property, drilled to a vertical depth of 500 feet across the mineralized quartz-diorite dike could definitely prove its value.

CONCLUSIONS

1. The 532,500 tons of ore on the Davis property can be mined and treated with a resultant profit of at least $3.00 per ton.

2. Continued drilling below the 1,000 foot horizon along the track area can be expected to disclose ore of similar character to that above the 200 foot horizon.

3. Extensive drilling at depth between Lines 9000E and 10,400E has good possibilities of encountering ore within the limits of the A and B faults.

Respectfully submitted

"C.F. Ennis"

Mining Engineer
Member Assoc. Prof. Engineers

TOWNSHIP BECCARD DATA MAP 6 NO. 590

COMPANY DAVIS, SIR MORTIMER (SHEPPARD MINE)

LOCATION LOT 1, CON III

DATE	TYPE OF WORK	PLOTTED BASE BLWHITE	BASE CADMA	LOC'N ½ MILE	LOC'N MINE
1928	D. DRILLING 4DH 2154' NO LOGS, NO LOCNS. - NEAR SHAFT #1 25'E OF SHAFT #2 25'W "				
1928	① · DRILLING 4 DH 2154' NO LOGS. NO LOCNS - NEAR SHAFT #1 25'E of SHAFT #2 25'W OF SHAFT				

N

HANMER TWP.

BLEZARD

DISTRICT of SUDBURY

SUDBURY MINING DIVISION M. 670

SCALE 1 INCH TO 40 CHAINS

Whitson L.O. 6567

L.

Proposed 50' R/W

City Of Sudbury

McKIM TWP

VI V IV III II I

12 11 10 9 8 7 6 5 4 3 2 1