SUMMARY:

Limited sulphide mineralization has been established on Claims S-62653 --7 and S-62502 --5. This occurs in fractured zones and sheears and also at the contact of iron formation and greenstone.

Two shear zones have been located with dimensions of 1,400' and 700'. Geological and geophysical investigations have indicated that sulphide bodies may be associated with these shear zones.

Any of the rocks mapped may be hosts for sulphide mineralization.

Further exploration by surface methods including diamond drilling is justified.

Conclusions and recommendations are given at the end of this report.

INTRODUCTION:

It is requested that assessment work credit be granted on the following claims: S-62653, S-62654, S-62655, S-62656, S-62657; and

S-62502, S-62503, S-62504, S-62505

This report and map (in duplicate) is hereby submitted for recording as assessment work.

A geophysical survey of the above mentioned claims has already been carried out by The Consolidated Mining and Smelting Company of Canada Limited on behalf of The American Metal Company, Limited. This work has been recorded as assessment work for which credit was requested for 1952-53. The present geological survey, conducted from May 18th to June 3rd, 1954, has been made to allow for any deficiency in assessment work credit due on the geophysical survey. If, after this deficiency has been met, there is an excess of assessment work credit, this excess should be applied to the 1953-54 period.

PROPERTY AND OWNERSHIP:

The property surveyed consists of nine unpatented claims:-- Nos. S-62653, -4, --5, -6, -7; and S-62502, -3, -4, -5.

The property is held under option by The American Metal Company, Limited, Toronto, Ontario.

LOCATION AND ACCESS:

The property is located in the central part of Cunningham Township, Sudbury Mining Division, Ontario.

Latitude - 47°38'N

Longitude - 82°40'W

The claims, forming two separate groups, are outlined on the Key Map - (See

LOCATION AND ACCESS (Continued)

Geological Plan of Claims).

Claims S-62653 to S-62657 inclusive are situated approximately three-quarters of a mile by trail S.E. of the O.F.B. Tower. Claims S-62502 to S-62505 are located approximately three miles by trail S.E. of the O.F.B. Tower.

Access to the property is by means of an unimproved wagon road for a distance of thirteen miles N. from Sultan, a station and lumber mill on the main line of the Canadian Pacific Railway. Parts of the road are now in bad condition and are passable only for horses, tractor or jeep.

Beaver aircraft can land on Santimaw Lake, two miles N.W. by trail from the O.F.B. Tower.

The telephone line connecting the Cunningham Township Observation Tower of the Department of Lands and Forests with the Department's office at Sultan is now out of order. Radio is the present means of communication.

ACKNOWLEDGMENTS:

The American Metal Company, Limited wishes to acknowledge gratefully the free use of a cabin which was placed at their disposal by Lorne O. Sawyer, Tower Observer, Cunningham Township.

GENERAL HISTORY OF THE AREA:

Cunningham Township area has witnessed several attempts at mineral exploration. The occurrence of bands of Iron Formation first attracted attention but were proved to be too low grade for ore. Fifteen years later, in the 1920's, these same bands of Iron Formation again attracted attention due to the discovery in them of scattered and small amounts of lead, zinc and copper. No ore body of economic interest was located. One or two areas were

GENERAL HISTORY OF THE AREA: (Continued)

staked for gold in the early 1930's.

The last few years have witnessed further activity in the area with lead, zinc and copper again being the attraction.

It may be that the careful application of modern geological and geophysical techniques will succeed, where older methods failed, in the delineation of new ore bodies.

WORK DONE ON THE PROPERTY TO DATE:

A. The following development work was done before the present party commenced their survey and to the writer's knowledge has never been recorded:- Stripping, Trenching and Blasting: Claim 62657 - Length, 130'; Width, 4'; Depth, 3'.

Also four test pits in overburden each 4' x 4' x 4' deep.

The location is marked on the geological plan.

B. An electromagnetic survey of both groups of claims was carried out by The Consolidated Mining and Smelting Company of Canada Limited on behalf of The American Metal Company, Limited. This survey did not cover Claim S-62655. Few readings were recorded on S-62653 and S-62504. This work was done during February-March, 1954.

C. From May 18th to June 3rd, 1954, the present writer, along with two other employees of The American Metal Company, Limited conducted a geological survey of the nine Claims S-62653 - 7 inclusive, and S-62502 - 5 inclusive.

Three areas in Claim S-62655 were stripped and trenched:-

a. South boundary of claim: Length 30', Width 6', Depth $1\frac{1}{2}$'.

b. N.W. corner of claim: Length 80', Width $4\frac{1}{2}$', Depth 2'.

c. N.E. corner of the claim: Length 40', Width 6', Depth 1'.

WORK DONE ON THE PROPERTY TO DATE: (Continued)

The present report incorporates all other details of the geological survey.

GEOLOGY:

A. REGIONAL GEOLOGY:

The geology of the district is shown on Map 51f, and described in "Part VII, Vol. 51, Ontario Department of Mines, 1942 - Cunningham Garnet Area" (V.B. Meen)

A description of the principal lead-zinc occurrences shortly after their discovery and exploration in 1928-29, is contained in "Geological Survey of Canada, Summary Report, 1929, Part C, Mineral Occurrences of Woman River Area" (H.M. Bannerman).

The general regional geology of the district may best be summarized by including here the Table of Formations listed on Page 7 of V.B. Meen's report:-

QUATERNARY	
Pleistocene:	Sand and gravel.
PRE-CAMBRIAN	
Keweenawan:	Olivine diabase.
Matachewan:	Quartz diabase.
	Intrusive contact
Algoman:	(Granite, granite gneiss, quartz and feldspar porphyries, aplite, felsite, diorite, quartz diorite, pegmatite. (Lamprophyre (minette, camptonite, augite lamprophyre), basalt porphyrite.
	Intrusive contact
Pre-Algoman (Haileyburian?):	(Granodiorite, quartz diorite, diorite, quartz gabbro, gabbro, quartz diabase, diabase. (Peridotite.
	Intrusive contact
Timiskaming (?) (Ridout Series):	(Complex of sediments including conglomerate, quartzite, greywacke, arkose, slate, and various volcanic members similar to the (Keewatin below.

A. REGIONAL GEOLOGY: (Continued)

Erosional contact

Keewatin:	Basic to acid lavas including basalt, diabase, diorite, gabbro, andesite, dacite, trachyte, rhyolite, ellipsoidal or pillow lava, amygdaloidal basalt, tuff and agglomerate, flow breccia, hornblende and chlorite schists, i.e. greenstone, grey lavas, carbonatized lavas, porphyritic andesite, basalt porphyrite ("leopard rock").
Iron Formation:	Associated with the Keewatin rocks in this area and with both Keewatin and Timiskaming rocks in the areas to the north and east. Includes chert and chert breccia.

It may be noted that the Timiskaming? series is now tightly infolded with the oldest rocks.

The mantle of glacial drift which overlies the Pre-Cambrian complex is thin in most places but in some rather large areas completely covers all the consolidated rock.

REGIONAL STRUCTURAL GEOLOGY:

The members of the Keewatin and Timiskaming series have been closely folded and now possess a very steep dip. In general the strike of the strata is slightly south of east.

Shearing, according to V.B. Meen, is not particularly evident in the area. The rocks in general have retained their original character.

Considerable faulting has taken place. Prominent north-south faults have been mapped while other faults striking east-west and in other directions have been located. Faulting is of pre- and post- Algoman age.

B. GEOLOGY OF CLAIMS:

All the claims were mapped on a scale of 1" = 400'. Outcrop generally is poor and consists of scattered knobs projecting through a thin but widespread glacial drift cover. The topography is not hilly but much of the area is covered by swamp, muskeg, dense bush and deadfall. In general, then, it was impossible to delineate any special formation for any appreciable distance.

1. LITHOLOGY:

Special Note:- Most of the volcanic-like rocks mapped are assumed to be Keewatin although they may well include rocks mapped as Pre-Algoman (Haileyburian) by V.B. Meen. The reason for this is that the grain and texture of these basement rocks vary greatly not only from outcrop to outcrop but frequently within one outcrop. Thus the writer has found it impossible on the basis of the size of the area mapped to separate Keewatin from Pre-Algoman.

According to V.B. Meen's map the lower half of Claim S-62657 may be Pre-Algoman basic to intermediate intrusives while most of the centre parts of Claims S-62502 - 5 inclusive are also Pre-Algoman.

V.B. Meen has also pointed out in his report and map the difficulty of separating these two groups of rocks which are exceedingly alike in grain, texture and colour.

All rocks have been identified by eye only.

Claims S-62653 to S-62657 will hereafter be called Group "A" and Claims S-62502 - S-62505 will be called Group "B".

TABLE OF FORMATIONS

QUATERNARY	
Pleistocene:	Grey sandy clay.
PRE-CAMBRIAN	
Algoman:	Quartz-felspar porphyry. (May contain some of the coarse grained lavas - diorite, diabase, gabbro - mapped as Keewatin.)
Keewatin:	Basic lavas mainly, including basalt, andesite, diabase, diorite, gabbro, pillow lava, variolitic lava, basalt porphyrite, olivine basalt and olivine gabbro.
	Tuff and slate.
Iron Formation:	Associated with the Keewatin rocks. Banded or brecciated.

DESCRIPTION OF THE PRINCIPAL ROCK TYPES:

As stated above rocks of Keewatin age are assumed to underlie all of the area bounded by Group "A" and Group "B" Claims. These rocks are predominately dark green in colour although coarser varieties tend to weather a speckled whitish green.

The variations have been separated by symbols on the geological plan.

Lavas:

These rocks are mainly dark green in colour where fresh surfaces are exposed but display great variation in grain size and texture. Most of the lavas are massive or only faintly sheared. Grain size varies from dense to crystals 1½ cms. long. Wherever the grain size becomes coarse it is frequently diabasic also. The rocks include basalts, andesites, diabases, diorites and gabbros.

In Group "A" Claims the coarser varieties are exposed mainly in the southern half of Claim S-62657 where they strike east and west, while in Group "B" Claims they show a vague tendency to line up in a N.W. - S.E. direction.

Dark olivine basalts and olivine gabbros occur in the southern portions of Claims S-62504 and S-62505. They are fresh in appearance and are flecked by green olivine crystals. These rocks also tend to line up N.W. - S.E.

Variolitic lavas are exposed mainly along the contact of Keewatin Volcanics and Iron Formation in Group "A" Claims. This rock has a dark green, fine-grained matrix which contains an irregular distribution of felspathic ovals which average 1/4" in size.

These ovals weather out more slowly than the matrix and hence the rock frequently has a pimply appearance. This rock clearly lines up parallel to the contact of Iron Formation and Keewatin which (in Claim S-62654) trends

Lavas: (Continued)

N.E. -- S.W. As we move away southeastwards from the contact we appear to pass through the following sequence of rocks:- variolitic lava, fine-grained lavas, coarser-grained lavas and diabasic lava.

Fine-grained, dark green pillow lava was only rarely seen. In Claim S-62654 it was found to be associated with the variolitic lavas. It was also mapped in Claim S-62503. At neither of these areas were the attitude of the tops of the flows determinable.

One or two outcrops of a basalt porphyrite were recorded. These occur in Claims S-62655 and S-62656. The rock consists of a dark green, fine to medium-grained base with an irregular distribution of hexagonal to oval-shaped phenocrysts which average 1/4" to 3/4" in size. V.B. Meen has called this rock "leopard rock" because of its striking appearance. It appears to be yet another of the variations displayed by the lavas.

Only one outcrop of acid lava was noted, this being a fine-grained greyish-green rhyolitic type with some quartz eyes in it. It occurred in Claim S-62502.

Two small outcrops of stratified and sheared tuff were recorded along the northern boundary of Claim S-62505. The rock is greyish-green with a steeply dipping schistosity.

One outcrop of a dark green to rusty brown slate was located in Claim S-62504. It is taken to be a thin sedimentary layer intercalated with the Keewatin lavas. The rock possesses a steeply dipping schistosity. It contains scattered patches of pyrite cubes.

Iron Formation:

This rock outcrops along the west side of Group "A" Claims where the average strike and dip is N.50°E. 50°N. The rock is really a banded or massive iron-bearing quartzite.

Iron Formation: (Continued)

Where banded it consists of alternating thin, ex. 1", bands of light and dark chert. Brecciated cherty zones are common. The rock is dark brown and weathers a rusty brown red or orange.

Thin shaley bands have been altered to mica schist. Near the contact of the Keewatin volcanics it frequently has a brittle, crumbly character.

Scattered grains of chalcopyrite, bornite, galena sphalerite and more abundant pyrite have been noted along the contact of Iron Formation and Keewatin in Group "A" Claims.

In Group "B" Claims the presence of iron formation or some other body is suspected under the swamp area since on traversing these areas by pace and compass it was found that the compass was strongly affected. These compass anomalies have been noted on the geological plan. Two outcrops of highly siliceous sheared rock resembling iron formation have been mapped, one in Claim S-62503 and one in S-62505.

Algoman:

Only one small knob of quartz-felspar porphyry, located in Claim S-62654, was recorded. It is assumed to be Algoman.

The colour of the fresh rock is dark grey but it weathers whitish grey. Felspar phenocrysts 1/8" - 1/4" occur along with some quartz phenocrysts.

Pleistocene:

This consists as far as could be determined of a thin but widespread cover of greyish sandy clay.

2. STRUCTURE:

Owing to a general lack of conclusive geological evidence both in the greenstones and iron formation no clear-cut structural picture has been evolved.

GROUP "A" CLAIMS:

The contact of the iron formation and greenstone is assumed to dip under the iron formation with a dip and strike similar to those recorded for the iron formation. Hence the strike varies from N. to N.E. while the dip is between 45 - 65° to the W. or N.W.

As already noted there is a tendency for greenstones of similar texture to strike parallel with the contact - at least somewhere near it.

In the southern half of Claim S-62657 a band of coarse diabasic rock strikes east and west. This may be Pre-Algoman intrusives.

A possible small fault has been mapped in the N.W. corner of S-62656.

Outside The American Metal Company's property and north of Claim S-62653 two shear zones have been noted.

GROUP "B" CLAIMS:

Shearing in tuff and slate strikes approximately N.W. - S.E. and this may be the underlying regional strike since ridges and valleys strike in this direction also.

Two shear zones have been noted. The most marked of these occurs in Claim S-62505 where several outcrops of pyritised highly sheared tuff, greenstone and siliceous iron formation (?) line up to give a N.N.W. - S.S.E. shear zone. All along this shear zone, which is traceable across the entire claim, strong compass deflections were noted. An electromagnetic survey has been made of these claims and has concluded that a fault is present - this fault associated with either graphite, water-soaked peat, or sulphide mineralisation.

The writer's interpretation is that we have a strong shear zone, associated either with iron formation or massive pyrrhotite. It is interesting to note that the Brunton compass showed marked deflections even when the writer was standing on dioritic rock in the extreme south of Claim S-62505.

GROUP "B" CLAIMS: (Continued)

These compass deflections were stronger than any recorded near the main mass of iron formation in Group "A" Claims. The average strike of this shear zone is taken as N.20°W and dip 65°W.

In Claim S-62503 another shear zone is assumed present, strike N.45°W, dip 50°S.W. The electromagnetic survey has observed and interpreted this anomaly as similar to that in Claim S-62505. The strike length is, say, 700'.

MINERALOGY:

While no outstanding mineralized zones have been discovered several small mineralized areas do occur. These have been plotted on the geological plan.

Pyrite, chalcopyrite, sphalerite, bornite and galena have been recorded. These minerals, of which pyrite is the most abundant, occur in shears, fractures or at the contact of iron formation and greenstone.

The best mineralized area recorded was at the contact of iron formation and greenstone in Claim S-62657 where stripping and trenching occurred along with rare chalcopyrite disseminations and brown crystals of sphalerite.

Scattered galena and pyrite were located in basalt along the southern line of Claim S-62655.

The shear zone in Claim S-62505 frequently showed small seams or cubes of pyrite. A massive pyrrhotite ore body is possibly associated with this shear.

Other showings are indicated on the geological plan.

CONCLUSIONS:

Because of the frequent lack of conclusive geological data and the small percentage of exposed rock no well-defined geological picture has been established. However, bearing in mind the regional geology and the lead, zinc and copper

CONCLUSIONS: (Continued)

mineralization therein, together with mineralization recorded in Groups "A" and "B" Claims, the writer believes that the claim holdings merit further exploration. Special mention may be made of the two shear zones in Group "B" Claims which a geophysical and geological survey has proved give rise to strong anomalies.

It is believed that any of the rocks mapped may be hosts for mineralization and ore.

RECOMMENDATIONS:

1. Diamond drilling should commence on the two shear zones located on Claims S-62503 and S-62505. That in Claim S-62505 may well be drilled first. The suggested location of preliminary drill holes are marked on the geological plan. Details are as follows:-

D.D.H. I) Bearing 65° astronomic, dip 45°.
)
D.D.H. II) Length of hole not less than 400'.
Ax core should be employed.

Claim S-62503

D.D.H. III) Bearing 50° astronomic, dip 45°.

Details of further drill holes are left to the discretion of the geologist in charge.

2. During drilling, stripping and trenching should be carried out along the strike of the shear zones. The use of a Warsop drill and blasting powder would facilitate this work.

3. Stripping and trenching should also commence at selected areas along the iron formation - greenstone contact in Group "A" Claims.

The assumed fault in the North-West corner of Claim S-62656 demands further investigation.

4. The showing in Claim S-62657 merits further investigation with a view to drilling.

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1929	H.M. Bannerman, Geological Survey of Canada, Summary Report, Part C.
1942	V.B. Meen, Ontario Department of Mines, Vol. LI, Part VII.
1952 September 17th	A.P. Beavan, Report on Hennessy Property, Cunningham Township, S.M.D., Ontario.
1952 December 18th	R.R. Miquelon, Report to Page-Harley Mines Limited, Toronto.
1953	D.H. Gorman, Report to Page-Harley Mines Limited, Toronto.
1954	The Consolidated Mining & Smelting Company of Canada, Limited - Electromagnetic Survey, Cunningham Township Claims.

63.443

GEOLOGICAL PLAN OF CUNNINGHAM TWSP. CLAIMS.

SUDBURY MINING DIVISION.
ONTARIO. CANADA.

Scale
1" = 400'

Owners Name : The American Metal Company Ltd.
68 YONGE STREET. TORONTO. ONT.

Dates of Survey: May 18th to June 3rd 1954.

Geologist : Hf. macpherson. M.A.

· S Y M B O L S ·

- Strike and dip of bedding, attitude unknown.
- Strike and dip of schistosity, and fracture cleavage.
- Strike of vertical schistosity.
- Geological boundary, defined.
- Geological boundary, approximate.
- Fault, possible.
- Shear zone.
- Trail
- Swamp, muskeg.
- Ridge.
- Cabin.
- Stripping and trenching.
- Prospect pit.
- Compass deflection.
- Mineralised area.
- Suggested position for drilling.

O.F.B TOWER

Road leads from Fire Tower to The Sultan - Kenty Road.

Tower Observer's Cabins.

Edward's Lake

S-62655

S-62654

S-62653

S-62656

S-62657

Dense Bush - poor exposures

Much glacial drift.

Graphitic shale in overburden

Small lenses Cgt Sls.

Some Pyrite

Dense low bush

Much dead or poor exposures

Trail runs S.E. to other claims.

Boulders of I.F.

I.F. Rusty

Pyrite, Chalcopyrite, Sphalerite

Direction of Glacial Movement

Some widespread glacial drift

Lake

Old Camp

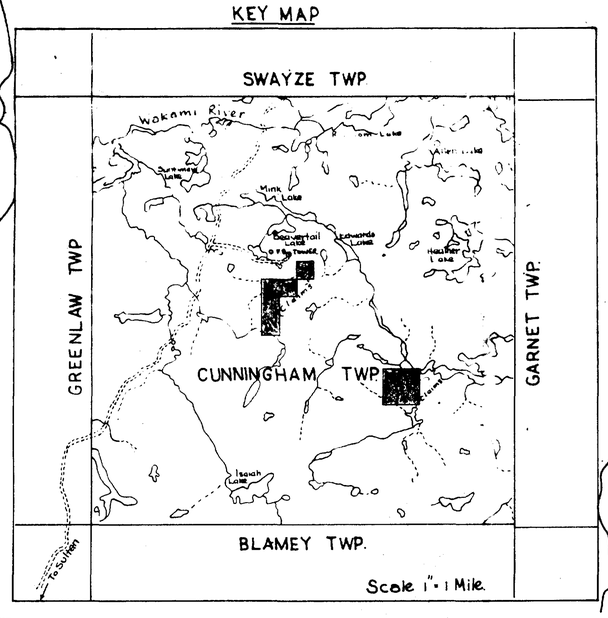
Boulders of V.F. and greenstone

Possible Ace Algomah intrusives

Silica Cemented Fractures

TRUE NORTH

KEY MAP



L E G E N D

QUATERNARY
Pleistocene - glacial drift, grey sandy clay

ALGOMAN
qFP Quartz Felspar porphyry

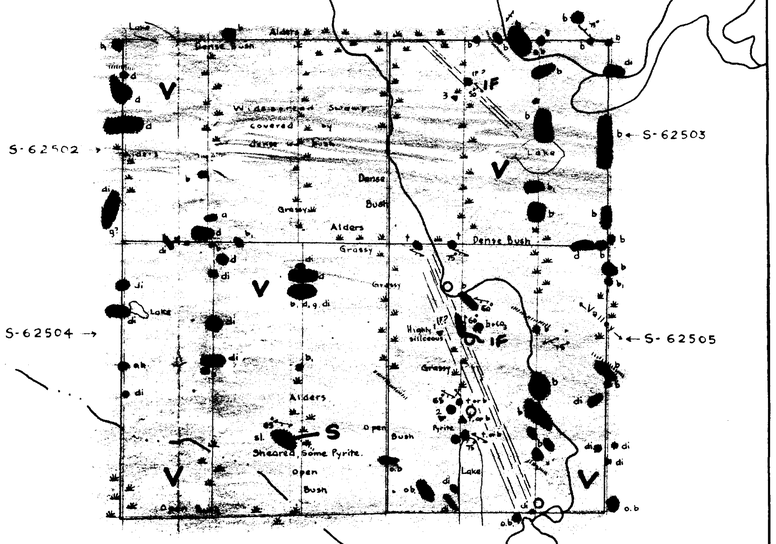
KEEWATIN — V

- b Fine-grained basalt and andesite
- b1 Coarser grained basalt and andesite.
- d Coarse-grained lavas - diabase
- di Coarse-grained lavas - diorite
- g Coarse-grained lavas - gabbro
- o.b Olivine basalt
- o.g Olivine gabbro
- b.v Variolitic lava.
- b.p Pillow lava.
- b.P. Basalt porphyrite.
- a Acid lava
- t Tuff
- Sl. Slate - (colored blue on map) — S

Iron Formation. Associated with Keewatin. — I.F.

- IF Iron Formation
- I.Fd Brecciated Iron Formation.

Base-Map employed is an enlargement of topographic map issued by Department of Lands and Forests at scale 4" = 1 Mile.



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