

INTRODUCTION

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Property: The property consists of a group of 130 claims situated in the "west-central" part of Robertson Township in the Montreal River mining district of Ontario. The Geologic mapping covers a block of 35 claims at the western edge of the central part of the group. The 35 claim group consists of claims MR. 37203,04,05,06; 37302,03; MR. 37518,19,20,76,77,84,85,86,87, 88,89,90,91,92,93; 37621,22,23,; MR. 41805,06,08,11,12,13,14,15,16; 41927,32. The 130 claim group is owned by Messrs. R. Welsh and McDonald as the major partners. This work was performed under an exploration option taken by Denison Kines Idmited.

A CESS

The property is most readily accessable by pontoon or ski equipped aircraft, the nearest airplane base is at South Porcupine, 29 miles northwestward from Whitefish Lake. Whitefish Lake is located over the northwestern portion of the claim group. A "good weather" bush road passes along the Eastern portion of the group some 25 miles from Matachewan on route to Radisson Lake. It is also possible to follow the Montreal River-Whitefish Creek by Gance from Matachewan to the central part of the property. Only two short portages, around rapids, are necessary.

PREVIOUS GROLOGIC WORK

The only publication available on Robertson Township is the O.D.M Geologic Compilation series, map 2046, Timmins-Kirkland Lake sheet, scale 1"=4 miles. This publication was based on Geologic mapping of Robertson Township performed by H.G. Rushton in July 1961 for Ventrues Limited plotted on a reconnessance map 1"=1 mile. No written Geologic report was available.

HISTORY OF PREVIOUS EXPLO ATION IN ROBERTSON TOWNSHIP

The first recorded work in Robertson Township was in October 18, 1944 when Mr. S.J. Terhune, a resident Geologist, wrote a report on an examination and sampling of a copper occurrence, (now located in the S-W quadrant of claim MR 37205) Mr. Rysack a prospector was then the owner, he presumably discovered the copper showing prior to 1944, Mr. Terhune reported a channel assay that averaged 1.07% Cu over 14.0 feet.

A second period of exploration activity on the Rysack Copper showing occured during the winter of 1953. Eight short holes were drilled over the copper showing directed, promoted and financed by a Mr. Marshal Pickering, Geophysical Surveys was carried out local to the Copper showing by Koulamzine Geophysics. No record of the work is available. In personal communications with Archie Plante, a diamond drill contractor at South Porcupine, Ontario, he stated that only one of the 8 drill holes produced a significant intersection, and that was a oblique intersection that he reports ran 12-16% copper from $45.0^{\circ} - 62.0^{\circ}$ in a - 60° hole.

From personal communications with Mr. P. Ferterber who carried out the E-M and magnetic surveys over an area local to the Rysack Copper showing for Koulmazine Geophysics, it was learned that no E-M conductor was located in the vertical loop E-M survey and that no significant magnetic pattern was recognized.

A third period of exploration activity was undertaken on the Rysack Copper chowing in September and October of 1956 by Cobalt Consolidated Mining Corpn. of Cobalt, Ontario, under the direction of J.J. hyland. A little over 2000 feet of drilling was performed. The first 3 holes 1A, 1P and 1C were directed to intersect the Rysack Copper showing, projected but these were unsuccessful in extending significant m² Holes #2-6 were drilled as step-out holes eastward

TOPOGRAPHY & DRAINAGE

The topography is relatively flat with relief changes within a 100 foot range, with exception of, the Northeastern bank of the Whitefish Creek where a steep hill rises 150 to 200 feet above the stream level. This appears to be a topographic expression of the Montreal River fault.

The whitefish Creek emptys into the Fredrickhouse River that flows into James Bay. In Robertson Township all local creeks empty into the Whitefish Creek, but numerous beaver dams on the creeks have backed up water to form several pond-like lakes. Overburden is generally shallow, but here outcrop, ings are not cumerous, in most cases, grub-hoe work is necessary to remove the 6 inches of moss and soil.

SATURAL RECOURCES

A 'second growth' forest of birch, poplar, spruce, scrub maple and alders are widespread, with scattered giant Red pines and spruce on ridges of sandy soil. Cedar growth is heavy in the bogs along the shores of Whitefish Creek. No sand or gravel deposits were recognized in the mapped area. Surface and soil conditions suitable to farming is also rare.

GENERAL GEOLOGY

The country rocks of the Robertson Township area are early Precambrian volcanics and sodiments, cut by later intrusives. In the map area, no sediments are present. The Keewatin volcanics consist of steep, easterly trending interlayered acid and intermediate volcanics. An area of basic matavolcanics occurs at the northern portion of the group.

The intrusives of the map area consist of a relatively wide anorthosite sill, numerous gabbroic intrusions and a quartz-feldspar rich (diabase?) dyke.

TABLE OF FORMATIONS

CENOZOIC

Recent - peat, humus, silt Pleistocone - clay, sand, boulder clay

Great Uncondormity

PRUCAMBRIAN

POST LEELATIN

Quartz-Feldspar (diabase?) dyke

Intrusive Contact

Gabbroic Intrusions

Intrusive Contact

Anorthosite Intrusion

Intrusive Contact

KEEWATIN

Volcanics:

Rhyslite - Dacite

Andesite - Spherulitic pillow lava and sheared andesitic rock Basalt - A basic metavolcanic, amphibolized

ROCK TYPES

BASALT

This basic metavolcanic is a fine grained, dark, massive rock in outcrops. Close examination with hand lens reveals the rock is composed chiefly of fine amphibole in fine radial clusters of tremolite? and also of long blades of actinolite. This rock is an amphibolized metavolcanic, its chemical composition, now, is the equivalent of a gabbro. This rock type occurs mainly in a belt along the northern portion of the mapped area, and represents the oldest rock of the map area, since it underlies the spherulitic pillowed andesite formation. This rock is exposed on both sides of the Montreal River fault, and frequently outcrops near the fault, about 2% fine pyrite and pyrrhotite occurs in this rock.

This rock is generally massive and structureless but in places a weak, steep lying east-west trending schistosity becomes apparent when the rock is broken.

ANDESITE

This andesitic lava is commonly sheared, chloritized and partly amphibolized. Pillowed lavas with spherulitic rims were mapped in several outcr3DE on both sides of the Montreal River Fault. Mapping of the pillowed tructufes indicate flow tops are to the south on the East-west trending ructure? th t dip about 75° to the south. The sheared andesite carrys 2-4% e pyrite and parthotite with traces of chalcopyrite. Some finely disseminmappedite Van also recognized.

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Rhyolitis and dacites occur in the southern part of the mapped area

as a series of bands interlayered with andesitic lavas. The best exposure of rhyolite occurs across the beaver pond (eastwards from the Rysack Copper showing) on line 16400 E at 9400 N. The rhyolite there, is massive, hard and fine grained, white in outcrop, with a set of joints that allow the rock to break in blocks. Nost of the rhyolite mapped to the south was exposed by grubhoe stripping of moss cover, and in most cases, was found to be a sericitic rhyolite or dacite. Quartz-porphyry, probably related to the rhyolite flows was recognized on line 4.00E at 25400 S.

POST KEEWATIN

INTRUSIVES

Anorthosite

The oldest recognized intrusive is the conformable intrusion of anorthosite which occurs in an east-west trending, steep-dipping sill along the 00 base line. It is roughly 800 feet wide and prominently outcrops over that area, shrub vegetation tends to be sparse over the anorthosite. The rock is coarse grained, and is generally composed of over 90% light greenish plagioclase (Labradorite?) in coarse crystal clusters. The rock also contains about 5-10% feromagnesian minerals. Chlorite-amphibole occurs as interstitial minerals. In places the anorthosite grades to an anorthositic-gabbro where at certain locations it may contain up to 30 or 40% ferromagnesians.

The anorthos to occurs only to the east of the Montreal River fault in the map area. A reconnuisance traverse north and south beyond the map area to the west of the fault failed to loc to the anorthosite. The age relationship between the phorthosite and the Montreal River fault has not been determined, but the relatively regular thickness of the anorthosite continues right to the fault, which suggests it is of prefault age.

The unorthosite exhib ts a "magnetic-low" feature on the magnetic survey map. Sulphides occurrences are very rare in the anorthosite.

GABBRO INTRUSIONS

Numerous conformable, small, lens and pod-like intrusions of gabbro occur in the map area especially to the north of the band of enorthosite and immediately to the south of the anorthosite. The relationship between the gabbro and anorthosite is well established. On lines 18+00 and 20+00 East at 5+00 N, a well exposed chilled contact, clearly marks the gabbro as intrusive into the enorthosite. The gabbro is usually medium-grained but grades to coarse in some intrusions. The gabbro is composed of about 3.3 light greenish plagioclass and 65% ferromagnesians, chiefly, amphibole, the gabbro also contains about 2.1 fine sulprides, chiefly pyrrhotite with some pyrite and traces of chalcopyrite. The magnetic survey map indicates that not all portions of the gabbro are magnetic. Strong endote alteration occurs in the gabbro body that contains the kysack Copper showing, that body of gabbro is in contact with the north portion of the snorthosite. At the locale of the copper showing, the gabbro has been about such and cilicified which gives the gabbro a dioritic appearance at the locale of the showing.

Quartz-Foldspar Dyke

This steep dyke strikes about N-15°W and is about 60 feet wide, near the kysack Copper showing, this dyke was observed to cut across both the anorthosite and the epidotized gabbro. This dyke is composed of 70% feldspar (oligolclase?) 20% quartz and 10% fine dark minerals, chiefly black hornblende with some magnetite and ilmenite. The rock is medium grained, with a sugary texture. The general stitude and age relationships of this dyke is similar to the northerly trending diabase dykes of the region. However, the non magnetic characteristics and general composition change its classification.

STRUCTURAL GEOLOGY

(1) Folding

There is no evidence of local folding in outcrops or of the trend of formations over the 35 claim group mapped. The formations trend Easterly and dip steeply southwards at 70-75°. The tilting of Keewatin formations to their present steep attitude doubtless is related to some ancient folding on a regional basis.

(2) Shearing

Strong shearing is evident in the schisted andesites, one formation about 1/4 mile north of the base line is strongly sheared, chloritized and amphibolized, but pillow rims with spherules are still easily recognizable. Some rhyolitic formations are schistose and sericitic especially those 1/4 to 1/2 mile south of the base line. Local narrow shear zones occur in both Keewatin volcanic rocks and in Gabbro.

The Regional shearing which trends between E-W to N-70°-W swings to about N-50°-W when the formations are traced westwards to within 1000 feet of the Montreal River fault. This change is shear direction is interpreted as a fault-drag structure.

FAULTING

The most important structural feature of the area as indicated on O.D.K. map 2046 is the North-west trending Montreal Eiver fault and the Northerly trending Radisson Lake fault which intersect at Nokomis Lake. Both these faults are marked by topographic depression linements. There is an obvious disruption of continuity of formations to the east and west of the Montreal Eiver fault. Most obvious is the occurrence of anorthosite only to the west of the fault in a belt of regular thickness. Shear trends to the east of the Montreal Miver fault are dragged from westerly to Northwesterly as the rocks approach the fault. The mognetic background lowers significantly on the west side of the fault as compared to the East side, a greater number of gabbroic intrusions occur on the eastern side of the Montreal River fault.

ECONOMIC GEOLOGY

The only known mineral showing of importence in the map area is exposed by trenching near line ROF. at 600 feet north of the base line, on an outcrop of sheared and silicified gabbro, that occurs at the shore of a large beever pond. This showing was known as the <u>RYSACK COFPER</u> showing.

The mineralization consists of chalcopyrite and pyrite localized along a > foot wide shear zone which strikes N-80°-W and along subsidiary fractures which trend about N-15°-W, parallel to a Quartz-Feldspar perphyry dyke, which cuts all rocks near the showing. Finely disseminated chalcopyrite occurs in rocks adjoining the shearing. A chip sample taken by this writer in a N-S direction ran 0.84% Copper over 11 feet.

Structurally, the mineralization appears to be a localized occurrence of copper at the intersection of the N-15°-W and N-80°-W shearing. The epidotized gabbro host rock is only about 300 feet wide at that point. The mineralization appears to be localized near the point of intersection of the shear zones by the quartz-feldspar Dyke.

GEOLOGIC SURVEY - Work Report

The Geologic mapping was carriedout personally, or under the supervision of Chester Kuryliw, Geologist. Mapping was carried out where lines were at 200 foot intervals.

Chester J. Kuryliw, Consulting Geologist, Timmins, Ontario	8 Hour Days
Field Mapping, July 5-6, 22-27, August 20-Sept 3, 1965	23
Rough Field Draughting evenings, same days as field work 80 hou	rs 10
Draughting & coloring final maps, Sept 6-Sept. 25	21
writing & editing Geologic Report Oct 15-22, Nov 16-17	10

Ron Smith, Field Assistant, Timmins, Ontario Field Mapping, July 5 - August 24 51 Rough Field draughting evenings, July 5-August 24 (64 Hours) 8

Gary Eden, Field assistant, Timmins, Ontario Field Mapping August 12-24 13 Rough Field Draughting evenings, August 12-24 (16 Hours) 2

Pat Hyman, Typist & Seconder, Timmins, Onterio October 20, November 17, 1965

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TOTAL

140 8 Hour Days

Note: 140 X 17 = 980 asso: sment days distributed over 35 claims aver: ge = 28.0 assessment days per claim.

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liw Chester J. Kuryliw Consulting Geologist



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INTRODUCTION

In August, September and October 1965 a magnetic survey was carried out on a group of 35 claims in Robertson Township. Numbers (as in Geology report) The group is located in Robertson Township adjoining to the South-east of whitefish Lake. The claim owners are R. McDonald of Toronto and S. Welsh of Matachewan, Ontario who agreed on a working option with Denison Mines Limited. The property is readily accessable by float equipped aircraft from the South Porcupine Airport 29 miles to the N-West.

The purpose of this magnetic survey was to obtain the magnetic pattern and to determine if there is any association between magnetics and the mineralization of the Rysack Copper showing and to obtain structural and subsurface rock information.

The Electromagnetic survey was carried out on a group of 11 claims centered over the Eysack Copper showing to locate exposed subsurface the group includes claims Nos. 37618,19,20; 37576,77,84,86,87,88,39,90,92. Conductors which might prove to have sulphides of economic significance, especially if a conductor was related to the Copper showing.

The accompanying maps show the area surveyed and the results obtained.

METHOD AND IN CEREMETATION OF RESULTS

Magnetometer survey

Two types of magnetometers were used for this survey. Askania torsion magnetometer with a scale constant of 2-214 gammas per scale division, was used to establish base stations along the base line and was also used for reading some of the cross lines. The readings were recorded to the nearest half division and plotted to the closest 5 gamma interval. A sharpe Model MF-1 fluxgate magnetometer was used to read most of the cross lines. The readings were recorded to the nearest half division (10 gammas) and were plotted to the closest 10 gamma interval.

The readings have been plotted in gammas above or below an arbitrary base level. The lotted readings indicate changes in the vertical component of the magnetic field. The readings were taken at 100 foot stations along lines cut 200 feet spart.

RESULTS OF MAGNETIC SURVEY

The magnetic pattern is complex and of high relief due to the presence of a profusion of magnetic gabbroic intrusions, which are lenticular but conformable with the general easterly trend of volcanic formations. A wide easterly trending anorthosite along the base line has low magnetic characteristics. There is an obvious difference in magnetic background on either side of the Hontreal River Fault, the Eastern side has much higher magnetics than the west side. The general magnetic discontinuity at the Montreal River Fault makes it easy to trace its location and confirms its presence.

ELECTROMAGHETTIC SURVEY

The Grone E-M unit used in the survey is comprised of 2 similar coil units which both transmit and recieve on a frequency of 1800 and 480 cycles, and are maintained at a distance of 200 feet apart. In this type of survey the resultant reading is a measurement in degrees and an anomaly is usually a resultant reading greater that 4 degrees plus or minus.

Readings were taken at 100 foot intervals along previously cut and chained lines 200 feet apart.

RESULTS OF BLACTREMACYPTIC SURVEY

No conductor was located in the electromagnetic survey, which indicates that no near surface heavy sulphide mineralization occurs at the Rysack Copper showing. The shear zone and disseminations of chalcopyrite with pyrite at the showing does not produce a conductor.

MACHETIC SURVEY - Work Report

	8 Hour Days
Chester J. Kuryliw, Consulting Geologist, Timmins, Ontario	
Supervision & Consulting, Draughting-Contouring	
September 30-October 14 (5, 8 hour days + 10, 12 hour days)	20
Ron Smith, Operator, Timmins, Ontario	
Field Work, August 25- September 8, 1965	
Reducing rough plotting of readings September 16-Oct. 15	44 4
Gary Eden, Operator, Timmins, Ontario	
Field work, August 25-September 8 Sept. 16-Oct. 15	44
Reducing & rough plotting of readings	
Pat Nyman, Typist Recorder, Timmins, Ontario	
Typing and Recording October 14, 1965	1
TOTAL	109 days
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Note: 109 X 7 = 763 assessment days distributed over 35 claims Average = 21.8 assessment days per claim

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Chester J. Kuryfiw Consulting Geologist

CRONE E-M SURVEY - Work Report

	8 Hour Day
Ron Smith, Field Operator, Timmins, Ontario	
September 19-25, 1965	6
Rough Field draughting evenings (24 Hours)	3
Gary Eden, Field Operator, Timmins, Ontario	
September 19-25, 1965	6
Rough Field draughting evenings (24 Hours)	3
Chester J. Kuryliw, Consulting Geologist, Timmins, Ontario	
Consulting & Draughting Sept 20-29 (4 of 12 hour days)	6
	144 (1411)
TOTAL	24, 8-Hour Days

24 X 7 = 168 asses mont days distribution over 12 claims Note: Avorage = 14 assessment days per claim

Chester J. Kupplin Consulting Geologist

REPORT ON AIRBORNE GEOPHYSICAL SURVEY THE ROBERTSON TOWNSHIP AREA, ONTARIO, FOR DENISON MINI

INTRODUCTION I.

This report pertains to the combined airborne EM and magnetometer survey flown on behalf of Denison Mines Limited over a block of ground located mainly in the western half of Robertson Township and along the eastern edge of McNeil Township some 33 miles southeast of Timmins, Ontario. The flying was accomplished September 29, 1965 by the Canadian Aero Mineral Surveys Limited geophysically equipped Otter aircraft, registration CF-IGM, based at South Porcupine.

The survey lines were flown north-south (astr.) and were spaced at 1/8 mile intervals. The mean terrain clearance of the aircraft and equipment was approximately 150 feet. The geophysical data acquired totalled 102.2 line miles.

Canadian Aero Mineral Surveys Limited personnel associated with the project were as follows:

G. A. Curtis	-	Project Manager
G. Deluce	-	Pilot
R. Irvine	-	Aircraft Maintenance Engineer
D. Blais	-	Navigator
D. Sarazin	-	Data Compiler and Navigator
T. Peacock	-	Operator
D. Graham	-	Data Compiler
A. Martin	-	Draftsman
P. Tallyhoe	-	Data Chief.

CANADIAN AERO Mineral Surveys

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The project was supervised by A.R. Rattew, P.Eng., author of this report.

The EM data are presented on a plan map at the scale of 1 inch = 1/4 mile. An uncontrolled photo mosaic served as the base for this map.

Appendix I lists the EM anomalies detected.

Appendix II describes the equipment, the records, the survey and map compilation procedures and the data presentation system.

II. <u>GEOLOGY</u>

The Ontario Department of Mines preliminary geological map No. P.150 covers the area at a scale of 1'' = 2 miles.

A complex geological setting is indicated, consisting mostly of basic volcanics and sedimentary rocks, often interbedded. Acidic intrusives are mapped in the northeast and southwest corners of the block. One copper showing is marked on the map, occurring in basic volcanics about $1\frac{1}{2}$ miles north-northwest of Nokomis Lake.

III. GEOPHYSICAL INTERPRETATION

Only three EM anomalies have been plotted. All are very weak features and all occur in Nokomis Lake. On anomalies 18B and 19A the response is entirely out-of-phase; on anomaly 18A there could be some in-phase response as well but this is highly

CANADIAN AERO Mineral Surveys

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questionable. In all cases the EM anomalies occur in close proximity to magnetic anomalies which range in amplitude from 150 to 400 gammas.

We interpret these anomalies as probable surface conductors resulting from weakly conducting material deposited on the lake bottom. The apparent relationship to magnetic highs is considered coincidental. The weak out-of-phase response is typical of surface conductors. The basic volcanic rocks which are prevalent in this area would account for the magnetic highs.

In the eastern part of Nokomis Lake on line 22, there is a possible out-of-phase response which could perhaps be plotted, but it is even weaker and broader than the others. This provides further support for the interpretation of weakly conducting deposits on the bottom of Nokomis Lake.

IV. RECOMMENDATIONS

Only in the event of an especially encouraging geological environment would we recommend ground followup of these anomalies.

If Denison considers followup advisable, a very careful ground EM survey would be required to locate these weak conductors. Ground magnetics would be of great assistance since the magnetic anomalies are very clear.

Respectfully_submitted,

A. R. Rattew, P.Eng., Geophysicist.

CANADIAN AERO Mineral Surveys

OTTAWA, Ontario, October 25th, 1965. - 3 -

APPENDIX I

PROJECT NO. 6009 - ROBERTSON TOWNSHIP AREA

<u>Anomaly</u>	Fiducials	In-Phase Quad	<u>Altitude</u>	<u>Magnetics</u>	<u>Rate</u>	Comments
18 A	3392/5	20?/30	170	N.Flank 400g	x	Very weak, possible surf- ace conductor
18 B	3401/5	-/20	145	N.Flank 150g	x	Very weak, probable surf- ace conductor
19 A	335 0/ 3	-/30	155	S. edge 200g	x	Very weak, probable surf- ace conductor

CANADIAN AERO Mineral Surveys

63.1789

DENISON MINES LIMITE



42A02NE0022 63.1789 MCNEIL

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4 KING STREET WEST · TORONTO 1, CANADA · EMPIRE 3-4991

Field Office, 344 Balsam St. N., Timmins, Ontario.

January 17, 1966.

Mr. R. V. Scott, Director, Department of Mines, Mining Lands Branch, Parliament Buildings, Toronto 2, Ont.

Dear Mr. Scott:

Ref. to 63.1789

Re 1 & 2: It was intended to record credit for claims MR 41929 and 41932, Not claims 41809 and 41810. This is now marked within the red boundaries on the aeromagnetic map.

<u>Re 3:</u> As you have rightly come to the correct conclusion, Group 2 should read: MR 37618, 19, 20, and the balance of the group 37576, 77, 84, 85, 86, 87, 88, 89, 90, 93 (13 contiguous claims).

<u>Re 4:</u> Mining claims 37667, 37670 and 37674 shown on the map were recorded for 22 days' credit as part of Group VII of 18 contiguous claim numbers 37643, 44, 45, 46, 47, 50, 51, 52, 53, 57, 58, 66, <u>67, 70, 71, 73, 74, 78.</u> The assessment work on the three claims is to be combined with the 141 claim group as originally recorded.

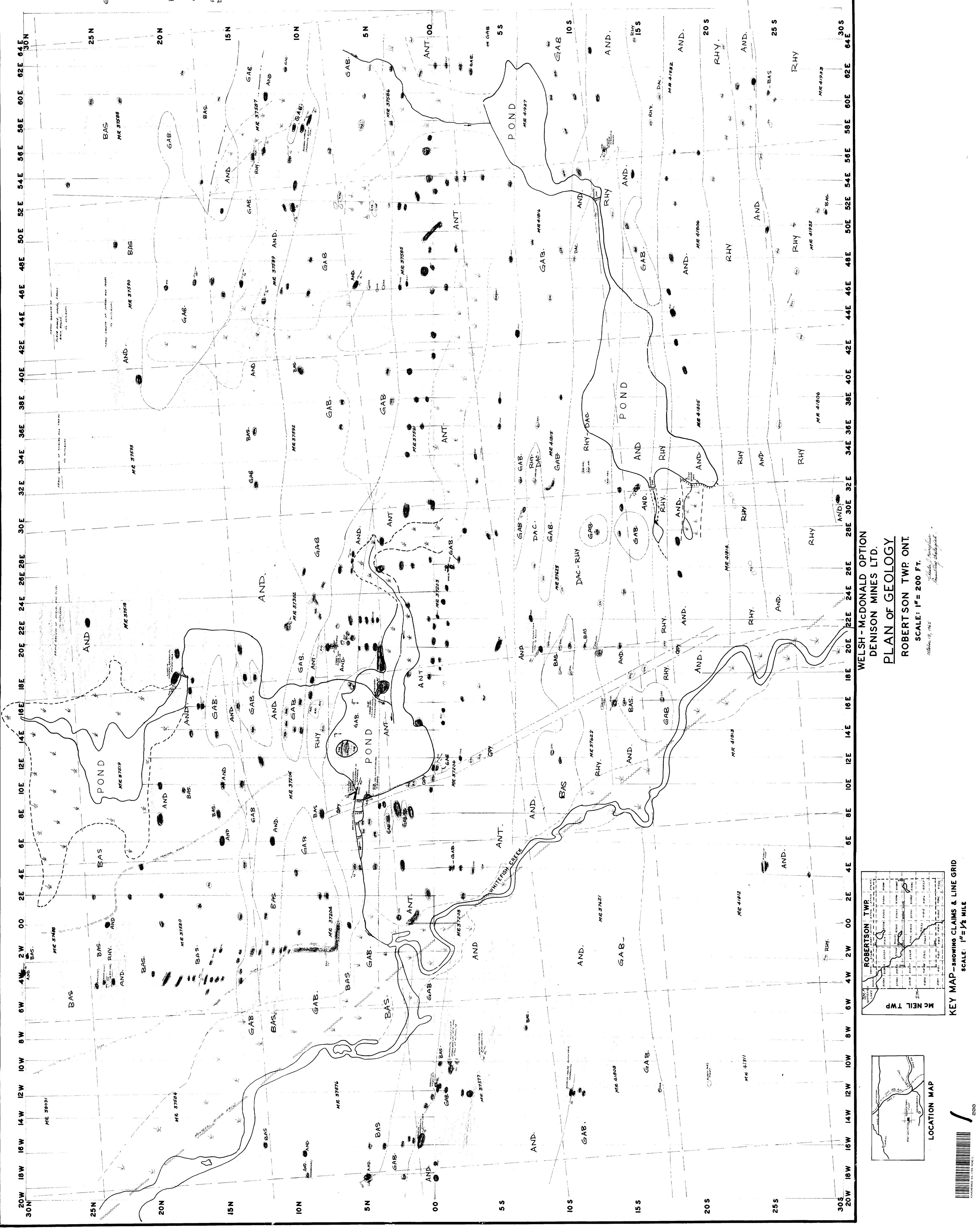
I have forwarded the maps to Canadian Aero Ltd., whose man in charge of the survey will sign the maps and forward them to your office.

Yours very truly,

Chester J. Kuryliv, Consulting Geologist.

CJK/B

c.c. Miss G. M. Clements, Mining Recorder, Elk Lake, Ont.



LEGEND PLEISTOCENE

PRECAMBRIAN POST KEEWATIN Q.D. (2) QUART - FELDSPAR (1) NTRUSIVE CONTACT GAB. (3) GABBER

INTRUSIVE CONTACT ANT. ANDETHODITE, IN PAK

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