THE HANNA MINING COMPANY

REPORT FOR

GEOLOGICAL AND GEOPHYSICAL SURVEYS

ON

CLAIMS S 291382, S 291387, S 323303, S 323304

SUDBURY MINING DIVISION, ONTARIO

December 14th, 1971

B. L. Hodgins

INTRODUCTION

This report covers work done by The Hanna Mining Company in 1971, on its Bennet Lake claim group in Rhodes Township (O.D.M. M-1077) Sudbury Mining Division. Work carried out includes linecutting, a magnetometer survey, a RADEM survey, an ABEM Gun survey and a geological survey.

PROPERTY

The Bennet Lake claim group includes 14 claims S 291376 to S 291387 inclusive and S 828303 and S 828304 but work covered in this report is confined to 4 claims, numbered S 291382, S 291387, S 8288303 and S 828304.

OWNERSHIP

The claims are held by The Hanna Mining Company, 805 - 69 Yonge Street, Toronto 215, Ontario.

ACCESS

Access to the property is by road or aircraft from Sudbury, Ontario. Road access is via Highway No. 144 north (50 miles) and then by a logging road northeast from the Benny turnoff for 28 miles.

The property is 35 air miles northwest of Sudbury and float equipped aircraft can land on Bennet Lake.

PREVIOUS WORK

No previous work in the area of the four claims has been submitted for assessment credit. Stripped outcrop and old EX drill core at one location near line 4+00E, 5+00N indicates that some work has been done in the past.

PRESENT WORK

Work carried out by The Hanna Mining Company and reported here includes:

1) Linecutting
2) Geological Mapping
3) Magnetometer Survey
4) ABEM Gun Survey (Electromagnetic)
5) RADEM Survey (Electromagnetic)

GRID SYSTEM

A compass controlled grid system was established on the property. The baseline extends from the shore of Bennet Lake to 28400 feet east. Picket lines were turned off of the baseline at right angles at 00, 400E, 600E, 800E, 1000E, 1600E, 1800E, 2000E, 2200E, 2400E and 2800E. All of the lines except 600E, 1000E, 1800E, 2200E, 2800E were cut north and south to the claim boundaries. Lines 600E, 1000E, 1800E and 2200E were cut north only and line 2800E was cut north beyond the claim boundary to Friday Lake.

The linecutting was carried out between August 17th and August 25th and on October 13th and 14th, 1971.

The baseline and the picket lines at 400 foot intervals were cut between August 17th and 25th and additional lines at 200 foot intervals, lines 600E, 1000E, 1800E and 2200E were cut on October 13th and 14th. A total of 4.28 line miles were cut including .63 miles of baseline.

PERSONNEL

N. Hogg, Consultant, 805 - 69 Yonge St., Toronto 215, Ontario

B. L. Hodgins, Party Chief, 805 - 69 Yonge St., Toronto 215, Ontario

H. Girroux, Linecutter, P.O. Box 94, Warren, Ontario

D. Hoggan, Linecutter, 86 Victoria St., St. Catharines, Ontario

D. Sannes, Linecutter, 805 - 69 Yonge St., Toronto 215, Ontario

Des O'Shannessy, Draftsman, 160 Bay Street, Toronto, Ontario

GEOLOGY

REGIONAL

Rhodes Township is underlain by rocks of Archean age (Card, 1965).

Bennet Lake is on the eastern end of a local remnant of highly metamorphosed gneissic and schistose rocks derived from Keewatin intermediate to basic volcanic rocks. The volcanics are enclosed and intruded by silicic intrusive rocks of "Algoman" age which form migmatitic units to the west, north and northeast adjacent to the volcanic contact.

Narrow bands of intercalated magnetic iron formation have been mapped along the north boundary of the "volcanic" belt and one of these bands crosses the Bennet Lake property near its north boundary.

LOCAL

The four claims were mapped between August 17th and August 31st, 1971 by Hanna geologist B. L. Hodgins assisted by H. Giroux.

The geology was mapped at a scale of 1" = 200 feet. Outcrops are relatively scarce and most of the exposures were either along haul roads or along cliff faces.

Shown below is table of rock formations in the grid area.

Recent			Glacial Debris Unconformity
Precambrian	Archean	Algoman	Granitic and Dioritic Intrusions
		Keewatin	Intermediate to Basic Volcanic flows and tuffs metamorphosed to gneisses and schists

GNEISSES AND SCHISTS

The gneisses and schists which have been derived from Keewatin volcanics and intermediate pyroclastics are granitized in the vicinity of the granitic and dioritic intrusions.

The area has undergone relatively high grade metamorphism, the volcanic rocks being converted to amphibole-biotite-plagioclase gneiss. Local retrograde metamorphism is indicated by the development of chloritic and sericitic schists.

The surface of the volcanic outcrops varies from fresh to highly altered. The weathered surface is dark gray to green-gray to rusty brown and it penetrates about 1/4 inch into the rock. In areas of sulphides the weathering zone is considerably thicker.

Many of the volcanics have porphyritic textures with coarse books of biotite or coarse hornblende or coarse grained clusters of quartz and feldspars (augen-like). These textures are considered to be secondary resulting from metamorphism.

Primary features noted in the altered volcanics include deformed pillows, fragmental zones and tuff horizons.

The principal mineral constituents vary from plagioclase feldspar-biotite-hornblende-garnet-quartz gneisses in basic volcanics to quartz-feldspar-biotite-hornblende gneisses in the granitized areas.

The schists vary from chlorite-biotite carbonate schists to sericite-quartz schists.

Texture varies from fine to coarse and structure from well banded, gneissic to nearly massive.

The gneisses and schists trend southeasterly and dip to the south at angles of 45° or less.

No faults were mapped but the shearing may be an indication that some rupturing has taken place.

INTRUSIVES

The volcanics have been intruded by numerous irregular bodies of granitic to dioritic rocks which have subsequently undergone metamorphism. Only one outcrop of pegmatite was mapped.

Intrusive relationships indicate that the granitic phase is younger than the diorite.

Composition of the intrusive rocks and particularly the amount of mafic minerals varies over short distances. The more mafic intrusives have been amphibolized and most are locally porphyritic.

Epidote, probably a result of deuteric alteration is associated with the granitic intrusions.

SULPHIDES

A small gossan was mapped between lines 12E and 16E at 5+00N. It is localized in an area of intense epidotization where granite and diorite intrude the older volcanics. Only a minor amount of pyrrhotite and pyrite was noted in the oxidized zone.

MAGNETOMETER SURVEY

The magnetometer survey was carried out by H. Giroux on August 27th and 28th, 1971. The preparation of the maps and reports has been completed by B. L. Hodgins, H. Giroux, D. Hoggan and Des O'Shannessy.

The readings were contoured using the following contour intervals -

100 gammas to	± 1000 gammas
1000 gammas above	+ 1000 gammas
below	- 1000 gammas

INTERPRETATION

Most of the map area has a relatively low magnetic relief (to 700 gammas). Intermediate to basic volcanics outcrop in this area; therefore, the whole area of low magnetic relief is interpreted to be underlain by volcanics.

The easterly to southeasterly trend defined by the magnetics in this area parallels the trend of the volcanics.

There are zones of high magnetic relief on lines 4+00E at 7+00S, 8+00E at 4+00N and 2+50S, 12+00E at 6+00N and south of the baseline 16+00E at 5+00N, 00 and 8+00S, and 20+00E at 7+00N, 1+50S and 3+00S to 9+50S.

These zones are variable in shape and size and no linear features are evident. They vary considerably in magnetic relief from 1,000 gammas to 18,000 gammas above background.

The magnetic highs on the baseline between Line 12+00E and Line 16+00E, on Line 8+00E at 2+50S and on Line 12+00E at 4+25S are underlain by dioritic intrusions.

Other areas of high magnetic relief can only be inferred as being related to the dioritic intrusives. This inference and the few outcrop areas were used to help delineate the contacts of the dioritic intrusions.

CONCLUSIONS

Nothing of economic significance appears to be related to the magnetic anomalies located on the Bennet Lake grid system. However, the magnetic survey results were useful in the interpretation of the geology.

RADEM SURVEY

A Radem survey was carried out by D. Hoggan on August 18th, 27th, 28th and 29th, 1971.

The maps were prepared by D. O"Shannessy and D. Hoggan and the report by B. L. Hodgins.

The results of the Radem survey are plotted in profile on a plan at 1 inch = 200 feet. Porfiles for dip angles and field strengths are plotted on all lines.

RESULTS

There are cross-overs, some with associated field strength anomalies, on lines 0+00, 4+00E, 8+00E, 12+00E and 24+00E. All are north of the baseline and all cross-Overs coincide with a swamp.

ABEM GUN SURVEY

This survey was carried out by D. Sannes and B. L. Hodgins on September 28th and on October 14th to check the anomalous zones located by the Radem survey.

The readings were plotted on a grid map at 200 scale. Two frequencies 880 cps and 3500 cps were used and the latter frequency was plotted above the former at each station.

RESULTS

On September 28th, only one of the Radem anomalies was verified; it was on line [illegible]. Another anomaly was located by the ABEM Gun survey on line 20+00E.

Additional work was recommended and lines 200 feet on either side of the ABEM Gun EM anomalies were cut and surveyed. This survey on October 14th located a weak anomaly on line 10+00E which represents the extension of the strong anomaly on line 8+00E.

CONCLUSIONS

One strong EM anomaly with no coincident magnetic anomaly was located on line 8+00E in swampy ground. The strike length is less than 400 feet and the width is interpreted to be 20 feet. Another, very weak one-line anomaly was located on line 20+00E.

One drill hole was recommended to test the anomaly on line 8+00E. The drilling results are being submitted under separate cover.

Respectfully submitted,

Beverly L. Hodgins

B. L. Hodgins,
Geologist

December 14th, 1971

* Card, K.D. (1965) Ontario Department of Mines Preliminary Map P-287 Cartier Sheet

File 2.789

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GICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey: Magnetometer - Linecutting - Radem - ABEM - Geology

Township or Area: Rhodes Township

Claim holder(s): The Hanna Mining Company

Author of Report: B. L. Hodgins

Address: 805 - 69 Yonge Street, Toronto 215, Ontario

Covering Dates of Survey: August 15th - September 1971 (linecutting to office)

Total Miles of Line cut: 4.28

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
–Electromagnetic	20
–Magnetometer	40
–Radiometric	
–Other RADEM	20
Geological	20
Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer _____ Electromagnetic _____ Radiometric _____ (enter days per claim)

DATE: Dec. 14, 1971 SIGNATURE: Beverly L Hodgins Author of Report

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)	
S	291382	
S	291387	ON S291387 ONLY
S	323308	
S	323304	

If space insufficient, attach list

TOTAL CLAIMS 4

OFFICE USE ONLY

PROJECTS SECTION

Res. Geol. _____ Qualifications 2.267

Previous Surveys L.D.

Checked by _____ date _____

GEOLOGICAL BRANCH

Approved by _____ date _____

GEOLOGICAL BRANCH

Approved by _____ date _____

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations 295 295 Number of Readings 295 295

Station interval 100 ' 100'

Line spacing 400 ' 400'

Profile scale or Contour intervals Magnetometer Survey, Contour Interval 100 gamma - + 1000 gamma
(specify for each type of survey)
1000 gamma above + 1000 gamma
1000 gamma below - 1000 gamma

MAG SUY, CONTOUR INTERVAL 100 GAMMAS-T 1000 GAMMAS
1000 GAM. ABOVE
BELOW

MAGNETIC

Instrument Scintrex MF-2 Fluxgate Magnetometer - 295 readings
SCINTREX MF-2 FLUXGATE MAG - 295 READINGS

Accuracy - Scale constant 10 gamma for 1000 gamma scale 10 GAMMAS FOR 1000 GAMMA SCALE

Diurnal correction method determined values for BL stations and corrected picket line reading for stations to them.
(DETERMINED VALUES FOR BL STATIONS & CORRECTED PICKET LINE READING FOR STATIONS TO THEM)

Base station location 100/00

ELECTROMAGNETIC

Instrument	Crone RADEM 211 readings CRONE RADEM 211 READINGS	ABEM Gun - 135 readings ABEM GUN - 135 READINGS
Coil configuration	Vertical VERTICAL	Horizontal HORIZONTAL
Coil separation	VLF VLF	200' 200'
Accuracy	3° 3° (3°)	2% 2%
Method:	☒ Fixed transmitter	☐ Shoot back ☐ In line ☐ Parallel line
Frequency	(Cutler Maine) Cutler Marine (specify V.L.F. station)	880 cps, 3500 cps 880 CPS, 3500 CPS
Parameters measured	Dip Angle and Field Strength DIP ANGLE & FIELD STRENGTH	In phase - Out of phase IN PHASE - OUT OF PHASE

GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

INDUCED POLARIZATION – RESISTIVITY

Instrument

Time domain Frequency domain

Frequency Range

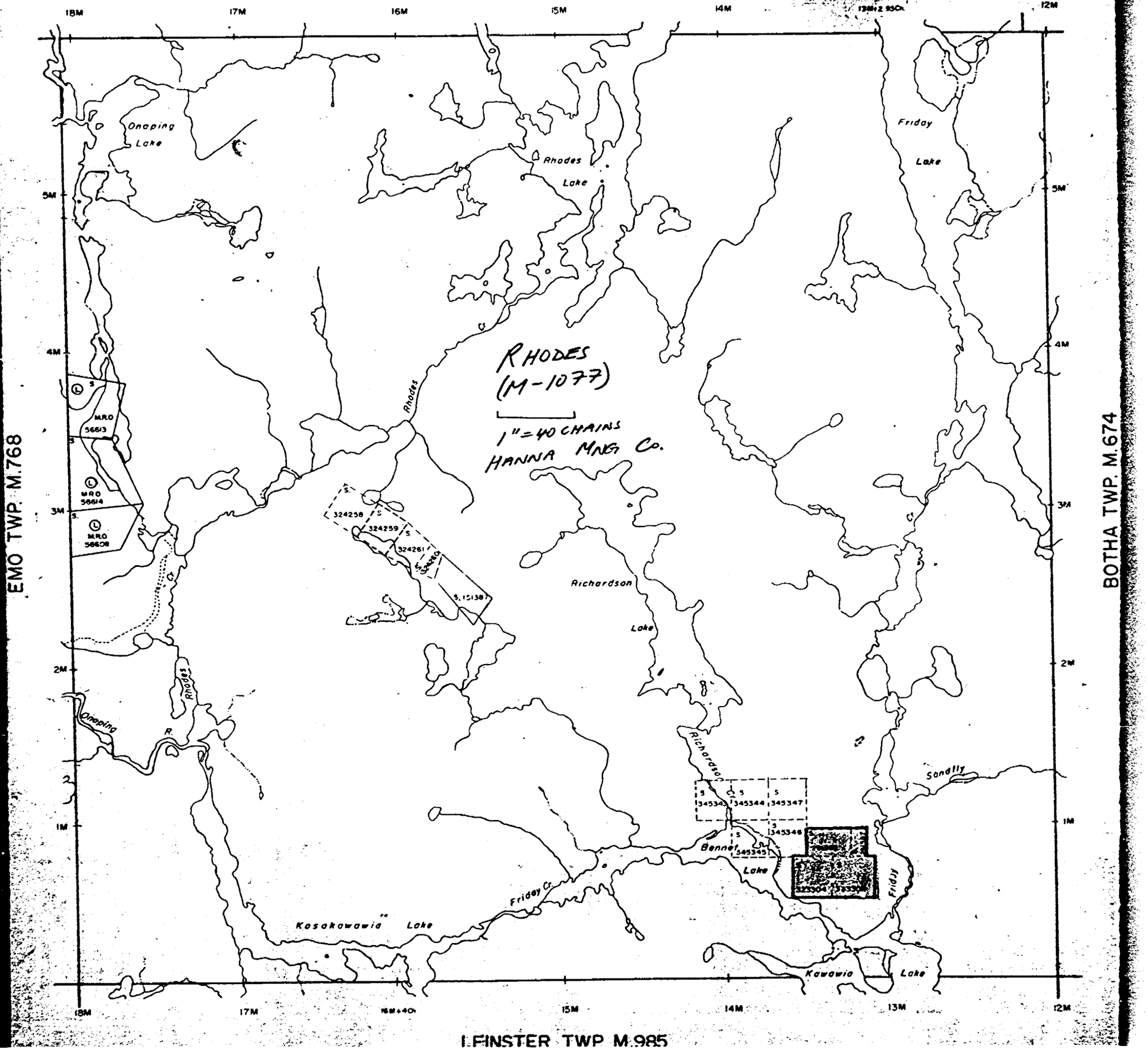
Power

Electrode array

Electrode spacing

Type of electrode

DUNBAR TWP. M.768



EMO TWP. M.768

BOTHA TWP. M.674

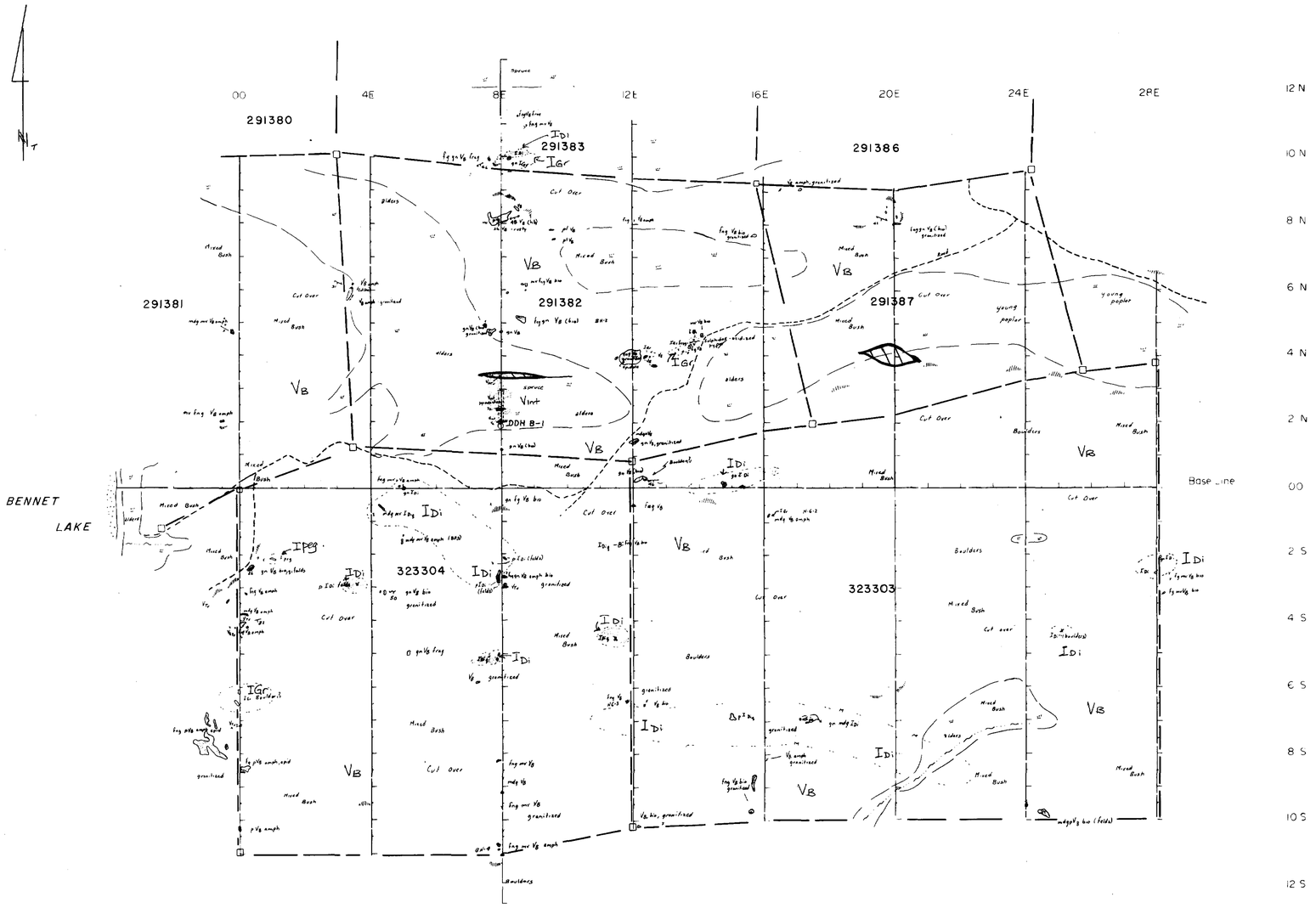
I.FINSTER TWP M.985

FOR ADDITIONAL

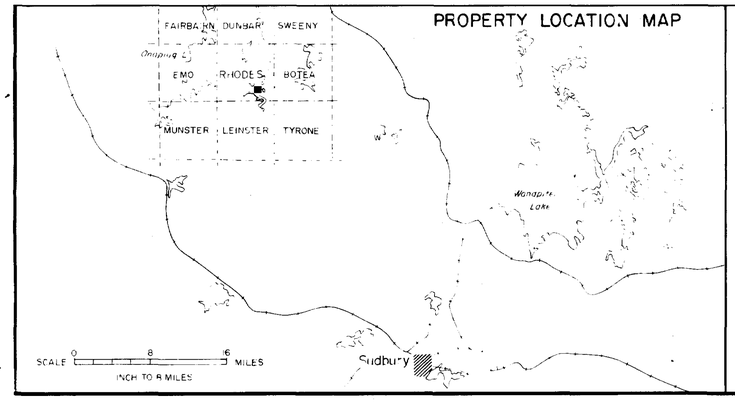
INFORMATION

SEE MAPS:

RHODES-0013-A1 #1-4



RHODES - 0013-A1, #1



LEGEND

Sediments

SQte Quartzite
unconformity

Acid Intrusive

IGr Granite

IPeg Pegmatite

Basic Intrusive

IDi Diorite

Acid Volcanics

VA Undifferentiated

Basic Volcanics

VInt Intermediate

VDa Dacite

VB Basic

Abbreviations

p porphyry
mdg medium grained
fng fine grained
mv massive
frag fragmental
gn gneissic
tu tuff
sh sheared

amph amphibolized
felds feldspar
bio biotite
q quartz

SYMBOLS

- Boundary of high ground
- Muskeg or swamp
- Boundary of muskeg, swamp or low ground
- Claim Boundary
- Claim post
- Small outcrop
- Boundary of outcrop
- Geological boundary, approximate
- Geological boundary, assumed
- Geological boundary, as indicated by magnetic data
- Strike and dip, direction of top unknown
- Strike and vertical dip, direction of top unknown
- Strike and dip of schistosity
- Strike and dip of foliation
- Timber Haulage road

THE HANNA MINING COMPANY

BENNET LAKE PROPERTY

BENNET LAKE AREA - RHODES TWP.
SUDBURY MINING DIVISION - ONTARIO

GEOLOGIC MAP

SCALE 200 0 200 400 600 FEET
1 INCH TO 200 FEET

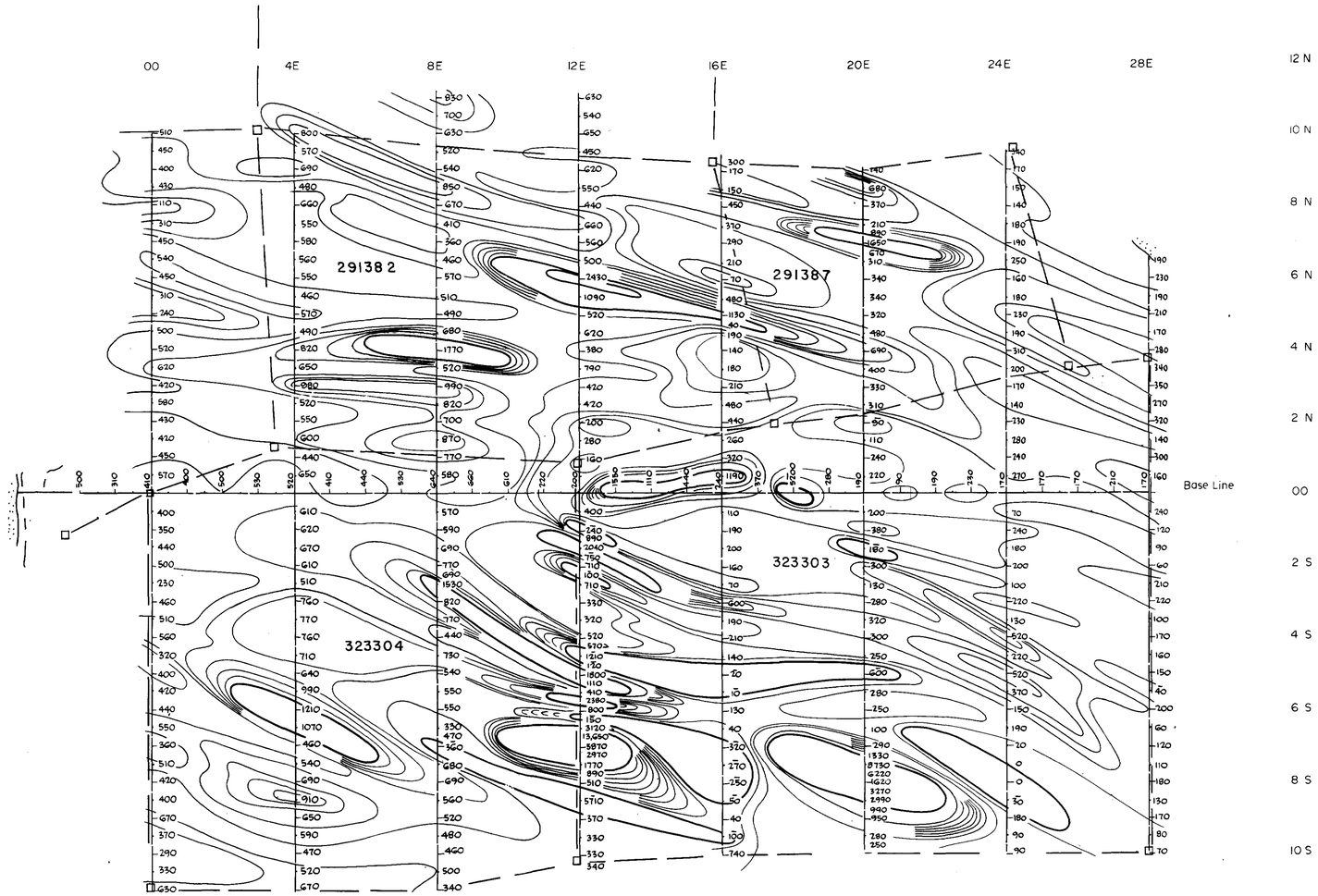
Work [illegible]
Date [illegible]

Interpretation by [illegible]
Date Dec., 1971

Revised
Revised

NTS 41-1-14

2.789



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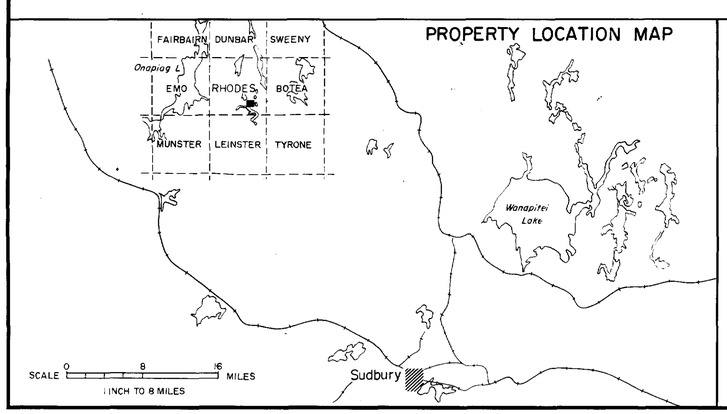
RHODES-0013-A1, #2

PROPERTY LOCATION MAP



NOTE:
INSTRUMENT - SHARPE MF-2, MODEL 32
The Readings are of the vertical component.

HUNDRED GAMMA CONTOURS
THOUSAND GAMMA CONTOURS
CLOSED MAGNETIC LOWS

THE HANNA MINING COMPANY

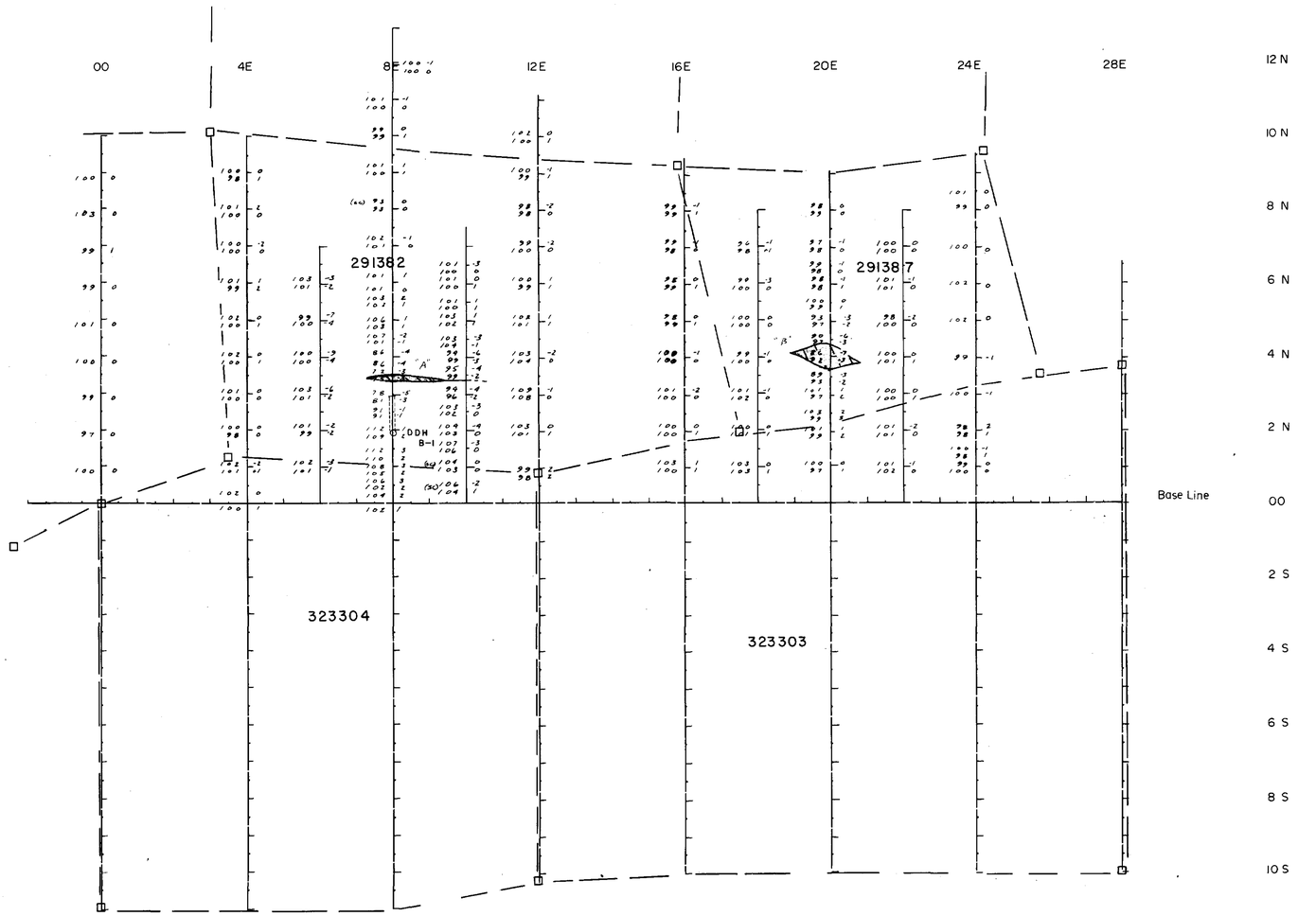
BENNET LAKE PROPERTY

BENNET LAKE AREA - RHODES TWP.
SUDBURY MINING DIVISION - ONTARIO

MAGNETIC MAP

SCALE 200 0 200 400 600 FEET
1 INCH TO 200 FEET

Work by H.C., B.L.H.	Interpretation by B.L.H.	Revised
Date	Date Dec, 1977	Revised
		NTS 41-1-14



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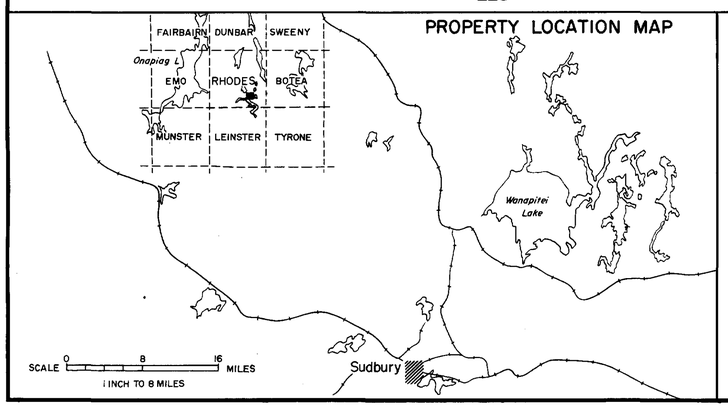
RHODES-0013-A1, #3

PROPERTY LOCATION MAP



NOTE
INSTRUMENT: ABEM GUN
HIGH FREQUENCY: 3520 cycles/second
LOW FREQUENCY: 880 cycles/second

EM ANOMALY

HIGH FREQUENCY
LOW FREQUENCY

short cable (sc) 100 0

THE HANNA MINING COMPANY

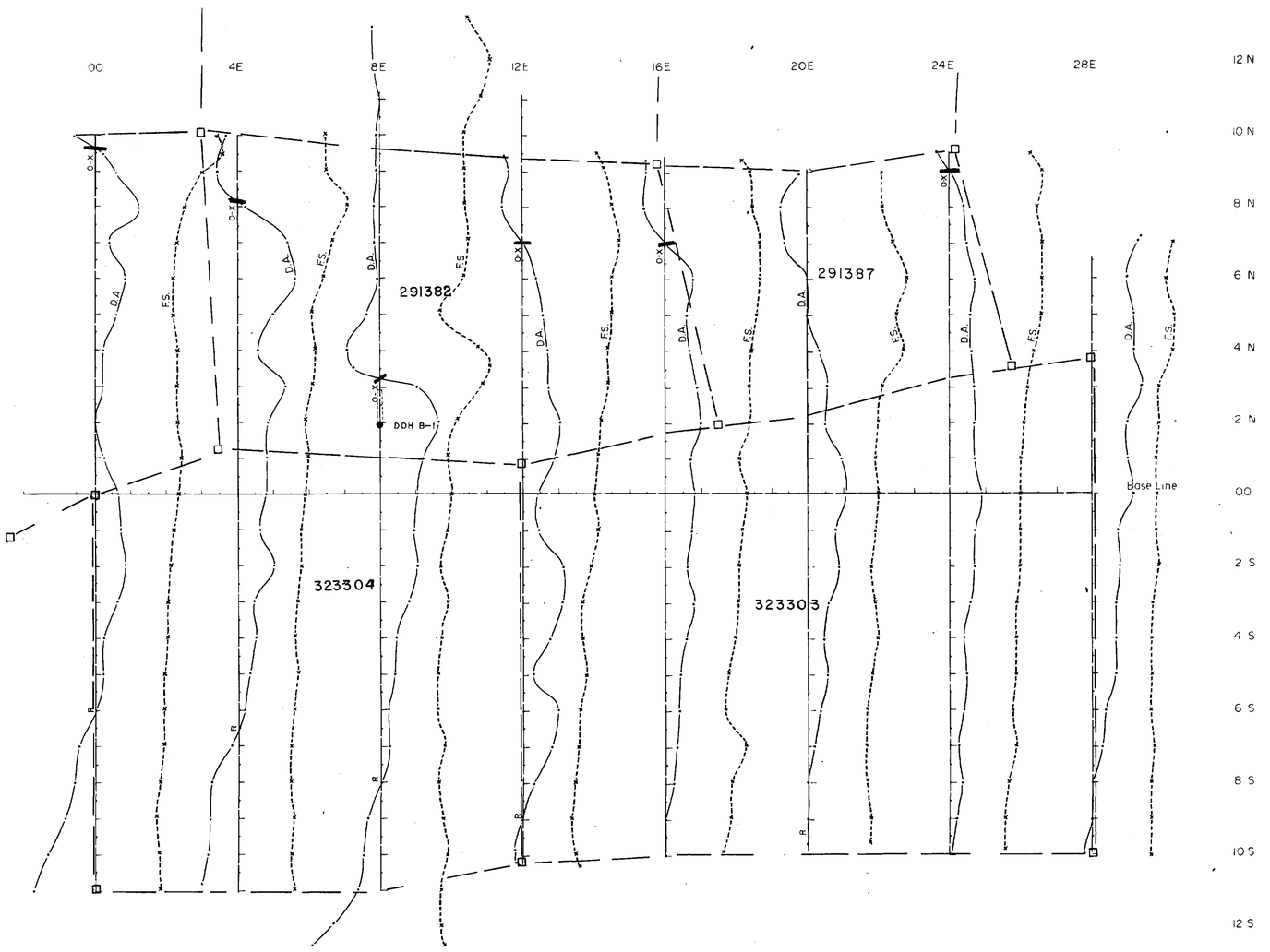
BENNET LAKE PROPERTY

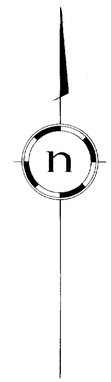
BENNET LAKE AREA - RHODES TWP.
SUDBURY MINING DIVISION - ONTARIO

ELECTROMAGNETIC MAP

SCALE 200 0 200 400 600 FEET
1 INCH TO 200 FEET

Work by DS, BLH Date Oct, 1971	Interpretation by Date Dec, 1971	Revised Revised NTS 41-1-14





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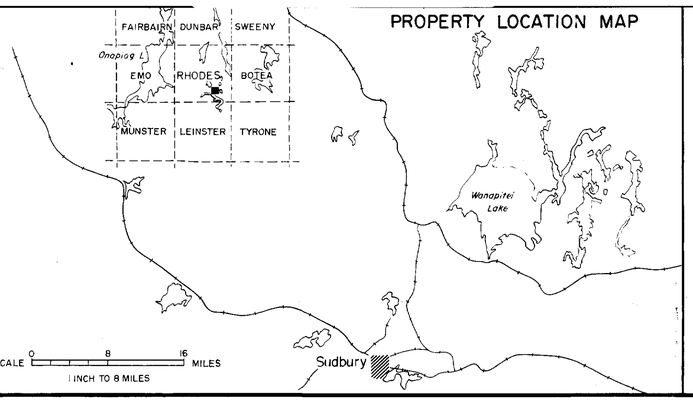
RHODES - 0013-A1, #4

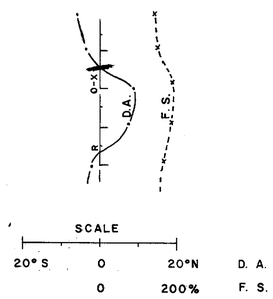
PROPERTY LOCATION MAP



NOTE
INSTRUMENT CRONE RADEM VLF EM

Station: Cutler, Maine

Frequency: 17.8 KHz



X-O	Cross-Over
R	Reverse Cross-Over
D.A.	Dip Angle
F.S.	Field Strength

THE HANNA MINING COMPANY

BENNET LAKE PROPERTY

BENNET LAKE AREA - RHODES TWP.
SUDBURY MINING DIVISION - ONTARIO

ELECTROMAGNETIC MAP

SCALE 200 0 200 400 600 FEET
1 INCH TO 200 FEET

Work by D.H Date	Interpretation by Burchell Hallof Date Dec 6, 1971	Revised Revised NTS 41-1-14

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