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RECONNAISSANCE ELECTROMAGNETIC (VLF) RADIOMETRIC (TV-1A) and GEOLOGICAL SURVEYS on the RASTALL OPTION (Nairn #1 Group) Nairn Township

Hollinger Mines Limited

Timmins, Ontario
January 1979

D. R. Alexander

INTRODUCTION:

During the period July 4 to September 13, 1978, reconnaissance electromagnetic (VLF), radiometric (TV-1A), and geological surveys were carried out over the Nairn #1 Group. The writer was ably assisted during the course of the surveys by W. H. King of Hollinger Mines Limited.

The Nairn #1 Group consists of twenty-six, contiguous, unpatented mining claims in eastern Nairn Township. The property is held under option from Messrs. W. Alanen and E. Crick of Nairn Centre and Mr. D. Rastall, of Sudbury. Exploration was undertaken as a joint venture between Hollinger Mines Limited, Timmins and St. Joseph Explorations, Toronto - 'Hollinger' acting as the operator.

Surveys were completed on either pace and compass or claim lines - the objective being to isolate areas of geological-electromagnetic-radiometric interest for future consideration.

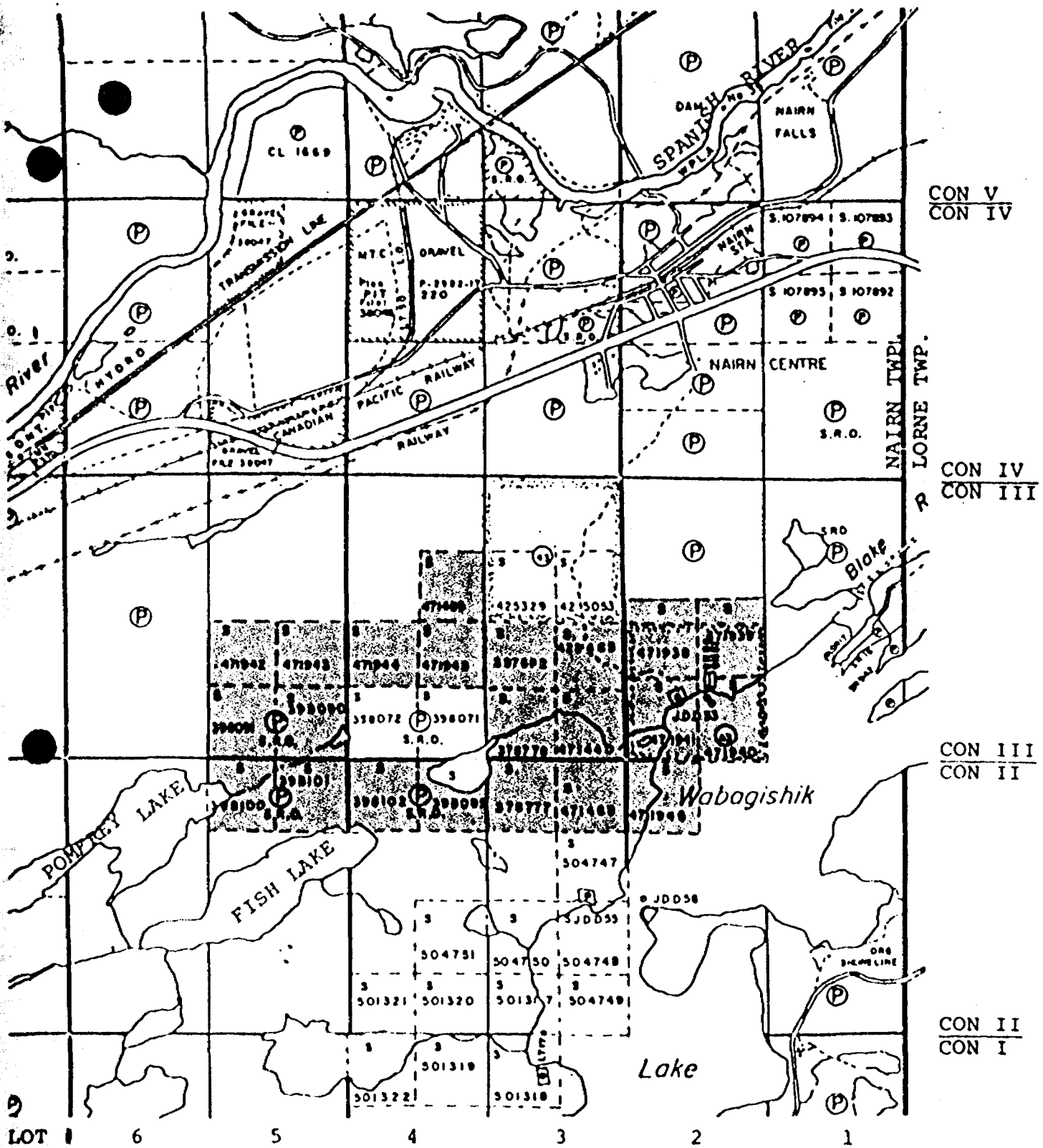
The claims covered for assessment are outlined on the sketches (following) entitled:

Claim Map showing claims covered under VLF and Radiometric Surveys

Claim Map showing claims covered by the Geological Survey

Claims 398071, 398072, 425053 and 425329 were previously covered in an assessment report by Hollinger Mines Limited, dated September 1, 1978. The writer gratefully acknowledges Mr. C.D. MacKenzie (author of the preceding), whose work has helped expedite writing of this report.

The property is accessible via Highway 17 to Nairn Centre, thence southward through the municipality to a bush road, which leads to Pomfrey Lake (see accompanying plans). Nairn Centre is approximately 20 kilometres east of Espanola, 60 kilometres west of Sudbury.



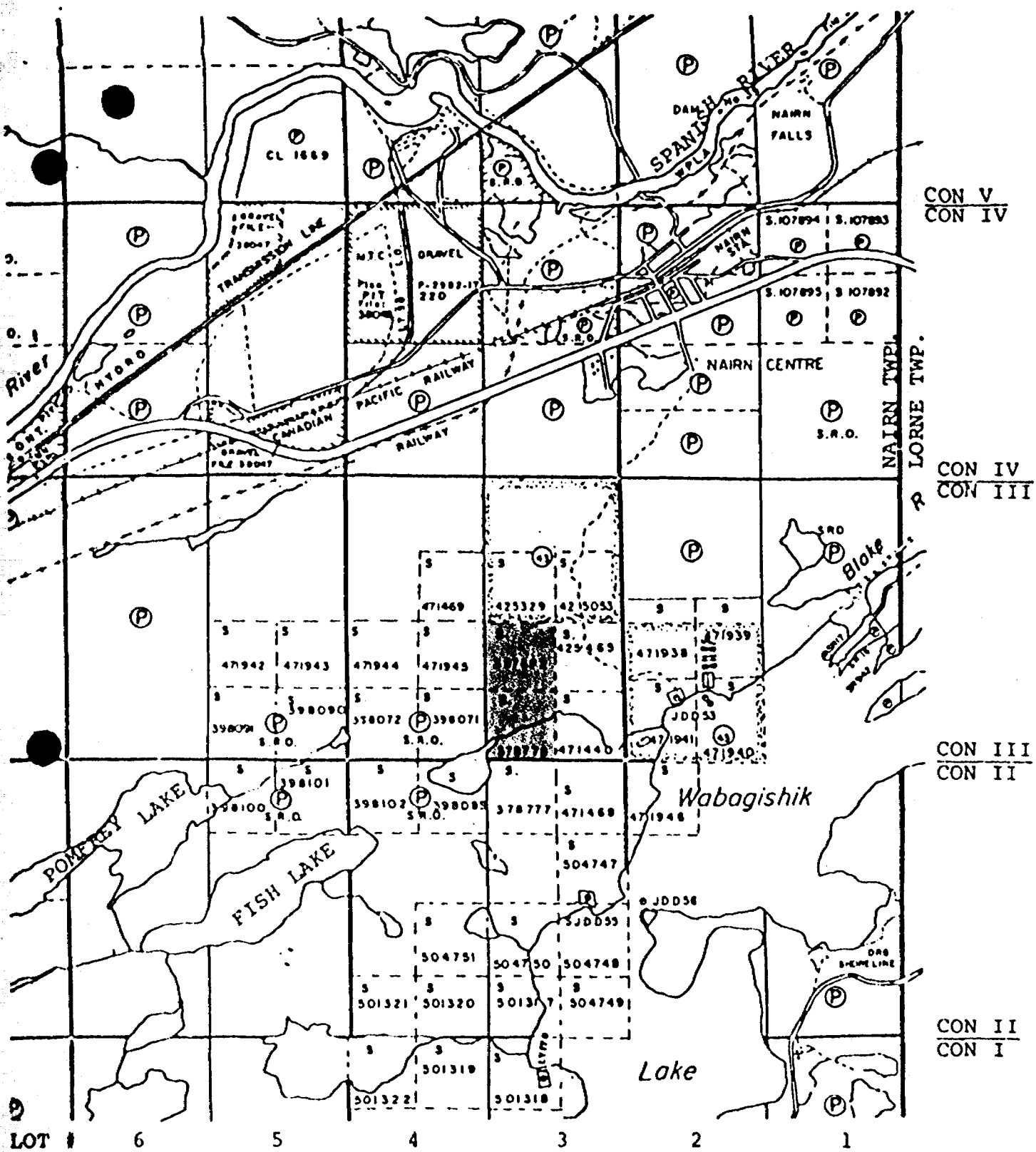
CLAIM MAP

SHOWING

CLAIMS COVERED UNDER

VLF and RADIOMETRIC SURVEYS

Scale = 1:31,680
(or 1" = 2640')



CLAIM MAP

SHOWING

CLAIMS COVERED BY

THE GEOLOGICAL SURVEY

Scale = 1:31,680
(or 1" = 2640')

Either a four wheel drive, or an all terrain type vehicle is necessary for travel along the bush road. The eastern and southern portions of the group are more readily accessible from Wabagishik Lake - boat rental and docking facilities are available at the Sandy Beach campground.

TOPOGRAPHY:

To simplify data presentation, topographic features and vegetation types are not included on the accompanying plans.

The outcrop map reveals the high percentage (estimate 70-80%) of bedrock exposure in the area, which basically controls variations in relief. Two particular geologic units - the Nipissing diabase dykes and the Ramsay Lake sediments - form long, high ridges trending northeast to east-northeast across the claim group. Contacts between these two units are apparent planes of weakness, for sharp valleys and swampy sections commonly occur near dyke margins or sedimentary contacts. The overall variation in relief amounts to approximately 100 metres across the property - in some instances, 60 to 100 metres of elevation being encountered in 60 to 100 metres of horizontal distance.

With minimal soils present on most of the outcrop areas, scrub oak, sumach, jack pine and less commonly maple are the characteristic tree types. Talus slopes and well drained valleys support mixed growths of poplar, maple, birch, red pine, balsam fir and spruce. In the east-east central part of the property, under poor drainage conditions, spruce and alder swamps are common.

PREVIOUS WORK:

The close proximity of the Sudbury Basin and its associated Cu-Ni deposits has prompted the search for Cu-Ni, dating as early as

1890. Neither the Sudbury Eruptive nor the 'offset' dykes, characteristic of the Basin, however, are known to occur in Nairn Township - the Nipissing diabases being the main target for exploration.

In 1975-76, the property was optioned to Falconbridge Nickel Mines Limited. Again, the area was explored with Cu-Ni potential in mind. A total of 6 'pack sack' holes were drilled in two separate localities (see accompanying outcrop map).

In the northern part of the present claim group, three holes were drilled along a sulphide-bearing shear zone in Nipissing diabase - surface trenching had encountered samples assaying up to 8.45% Ni combined with .71% Cu and 3.15% Co.

A selected sample from the trenches for polished section, described the mineral assemblage as:

> 'coarse crystals of gersdorffite with interstitial pyrrhotite, chalcopyrite, associated violarite and streaks of marcasite. Pentlandite, as well as nodules and cubes of pyrite were enclosed in pyrrhotite. The gersdorffite contained inclusions of niccolite and cubanite'.

Although a number of shears were encountered in the drill holes, the sulphides did not persist and no further work is recorded.

Further south, near the northeast corner of claim 378777, three holes were drilled in siliceous greywacke of the Pecors Formation. There, a network of pyrrhotite-pyrite-marcasite fractures with some hairline chalcopyrite fillings were tested. Drilling did not encounter more than 2% chalcopyrite over narrow widths and no further work was recommended.

REGIONAL GEOLOGY:

Nairn Township occurs along the north central portion of a wedge-shaped belt of metasedimentary and metavolcanic rocks originally designated as the 'Sudbury Series'. The belt extends

southwestward from Lake Wanapitei some 130 kilometres, to the north shore of Lake Huron.

In the mid-1960s, attempts were made to equate the 'Sudbury Series' with the early Aphebian (Huronian Supergroup) of the Elliot Lake area. Today, it is generally accepted that at least those sediments south of the Sudbury Basin are of Huronian affinity.

A discussion of the Huronian Supergroup by Frarey and Roscoe (1970) fairly well describes the position of the sediments on the property within the Huronian framework.

> (1) "The Huronian Supergroup occurs in a northerly-concave arcuate fold belt, 200 miles long and about 40 miles wide, in the Southern province, along the north shore of Lake Huron. This fold belt is truncated to the east by the Grenville province, and its extension to the west and south is concealed by Paleozoic cover rocks and waters of Lakes Superior and Huron.
>
> ...."The Supergroup, as much as 40,000 feet thick in the area between Sudbury and Lake Huron, thins northward within the main fold belt. Much of this thinning occurs in clastic units that also coarsen northward; some is due to northerly wedge-outs of basal units and some to unconformities within the succession.
>
> ...."The Huronian succession - first divided into lower and upper Huronian series, then Bruce and Cobalt series - is now considered to contain four groups. In ascending order these are: the Elliot Lake Group, the Hough Lake Group, the Quirke Lake Group, and the Cobalt Group.
>
> Elliot Lake Group
>
> "The Elliot Lake Group contains volcanic rocks - the Thessalon, Stobie, and Copper Cliff Formations, feldspathic quartzite - the Matinenda and Livingstone Creek Formations, and argillaceous sediments - the the McKim Formation.

(1) Baer, A.J. (editor) GSC Paper 70-40

...."In the Sudbury area, three thousand or more feet of argillaceous quartzite, siltstone and argillite of the McKim Formation overlie concordantly several thousand feet of volcanic rocks. These latter include the Stobie Formation, formed mainly of basalt, and the thinner, less extensive, overlying Copper Cliff Formation composed of rhyolite. The question of whether the volcanic rocks and concordantly overlying sediments are Proterozoic (Huronian) or Archean has long been debated because the basal contact of the volcanics is obscured by intrusives and no unconformity has been found between them and undoubted Archean rocks.

Hough Lake Group

"The Hough Lake Group includes the Ramsay Lake Formation - conglomeratic greywacke up to 600 feet thick in the eastern part of the belt but only a few tens of feet thick near Elliot Lake, the Pecors Formation consisting of siltstone, argillite, and fine to medium-grained quartzite, together up to 3,500 feet thick southwest of Sudbury, and the Mississagi Formation, 1,500 to 4,000 feet thick through most of the belt.

"In the northerly parts of the belt, the Ramsay Lake Formation rests directly on the Archean rocks, and in such areas, the Hough Lake Group oversteps the northern margin of the Elliot Lake Group. This northerly margin was probably near the northern depositional limit of the Elliot Lake Group, but it also represents an erosional margin. In the Quirke Lake area, there is clear evidence of an important disconformity, possibly even a low-angle unconformity, between the Elliot Lake Group and the Ramsay Lake conglomerate."

A stratigraphic section (following)(page 6) presents a more physical overview of the relationships between formations of the Huronian Supergroup in the Bruce Mines to Sudbury area.

The Huronian Supergroup is placed on the Precambrian time scale between the Archean, at 2600 m.y. and the post-Huronian intrusives at 2200 m.y. This latter unit is common in the Sudbury-Espanola area, and consists of a series of diabasic dykes and sills classed as 'Nipissing'.

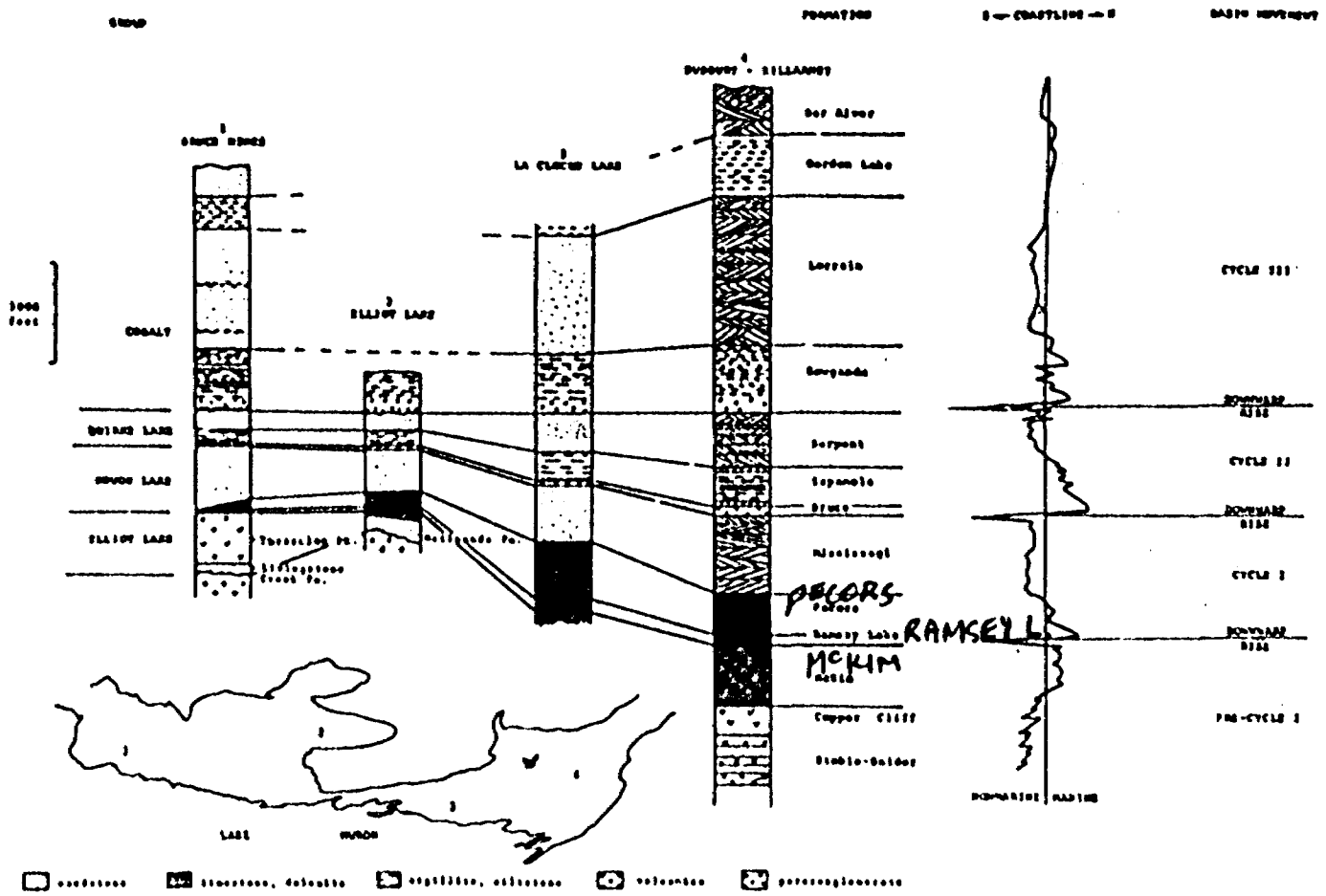


Figure 1. Selected stratigraphic sections between Sault Ste. Marie and Sudbury, Huronian cyclic deposition, and interpreted environments and movements (Section 3 courtesy F.W. Chandler and J.A. Robertson, Ontario Dept. of Mines).

(after Frarey and Roscoe)

✖ - Nairn Township property (approximate)

GENERAL GEOLOGY:

The Huronian sequence outcropping on the property spans the Elliot Lake Group-Hough Lake Group boundary, and includes the McKim, Ramsay Lake and Pecors formations.

The oldest sediments (McKim), are isolated along the north boundary of the claim group. Contacts with the overlying Hough Lake Group (i.e. Ramsay Lake formation), are obscured by a dyke of Nipissing diabase.

The few exposures of McKim present are argillaceous greywacke in composition - dirty, brownish grey sediments with beds up to 5 mm thick. Beds are distinguished through argillaceous component - the norm being brownish sandy beds separated by darker grey beds of argillite to argillaceous sand.

The Ramsay Lake formation is the lowest member of the Hough Lake Group and spatially occupies the central and southern portions of the property. The formation can be subdivided into two members - an older, subgreywacke, paraconglomerate unit which grades to a feldspathic quartzite, paraconglomerate unit. The latter member forms dramatic, white, weather resistant ridges across the central part of the claim group.

The lower member of the Ramsay Lake formation is dark grey green to black and brownish grey in colour. Conglomerate pebbles are widely separated, such that numerous sections appear to be subgreywacke in composition. The conglomerate is a polymictic paraconglomerate with fragments averaging 1-2 cm in size - only erratic horizons carry fragments fist size or larger. Bedding is absent in most instances - determinations being taken on shearing, jointing and/or fragment elongation. Scattered blue to blue grey quartz 'eyes' are characteristic.

Within approximately 30 m (horizontal distance), the lower unit grades from subgreywacke to feldspathic quartzite with conglomeratic portions. The quartzite is almost wholly composed of quartz and feldspar grains. Many of the feldspar grains are potassic. As previous, conglomeratic fragments are widely separated, ranging up to fist size. North of Hammond Lake and

along the west shore of Wabagishik Lake megaripple marks are found in the feldspathic quartzite. The weakly asymmetric ripples indicate a possible northern source area.

The Pecors formation, from the evidence noted during mapping, conformably overlies the Ramsay Lake formation. The most continuous exposure of Pecors is found around the east boundary of the claim group, north of Wabagishik Lake. There the rock is a bedded protoquartzite-sandstone with intercalated cherty and argillaceous units. The Pecors sediments are generally finer grained and more thickly bedded than the McKim sediments.

West of Wabagishik Lake very minor argillite is noted except in a few outcrops around Hammond Lake. Most of the Pecors in this area is a very fine grained, greyish to black proto-quartzite-subgreywacke.

Intruding the Huronian sequence is a series of diabase dykes designated as Nipissing in age. With exception to the dyke south of Hammond Lake, these intrusives are characteristic of the 'Nipissing' found throughout Northern Ontario.

The rocks are generally dark green to black in colour and medium to coarse grained with slightly finer grained margins. Megascopically, feldspar, hornblende, chlorite and biotite are easily distinguished. Local sections of diabase are highly altered to a felted mixture of tremolite-actinolite.

The diabase is nonmagnetic except in the presence of shear zones carrying magnetic sulphides (no oxides were noted). One such shear traverses the central part of claim 397682, and contains variable amounts of pyrrhotite, pyrite, chalcopyrite and nickel arsenides. A felsic differentiate(?) of the dyke pinches and swells along this shear, suggesting that a phase of faulting may be penecontemporaneous with late phase diabase intrusion.

The Nipissing dyke south of Hammond Lake is much narrower than the dykes seen elsewhere on the property. The

dyke is best described as a pyroxenite - pyroxene being effectively the only mineral present. Feldspar is rarely seen. The rock is black in colour, fine to medium grained, hard, and weakly magnetic.

Ginn[1], interprets this dyke to be fault controlled which may explain the difference in mineralogy.

STRUCTURAL GEOLOGY:

Interpreting the structural geology is complicated by the intrusion of Nipissing diabase and the number of structural events associated with these intrusions. At present, a potential syncline is in evidence from the north to south sequence of Lower Ramsay Lake-Upper Ramsay Lake-Pecors-Upper Ramsay Lake. The axis of this syncline plots along the south central part of the claim group, subparallel to local trends within the Nipissing diabase dykes.

A confusion with identification of a syncline lies in the fact that all of the above units dip in a southerly direction up to the dyke of Nipissing pyroxenite (the fault controlled unit). With bedding notably absent in the Ramsay Lake members, and a fault expected along the pyroxenite intrusive - a fold is not necessarily indicated.

Support for a syncline in this area, however, is derived from bedding determinations on Claims 471939-940 (north-east bounday) when compared with determinations along the point on Claim 471946 (west shore of Wabagishik Lake). Both exposures are 'Pecors' - the northernmost series of units dip south, while beds along the more southerly point dip north. Although data are not concrete, and a fault is predicted along the west shore of Wabagishik Lake, a fold in this area appears to be probable.

(1) Ginn, R.M. - ODM Geol. Rept. 35, pp 26-34 incl.

Within the two claims covered by the geological survey, faulting is basically determined through topography. Both the northerly, and the east-northeasterly trending phases follow topographic depressions for considerable distances. Neither shearing nor movement is indicated in the adjacent rocks although extreme brecciation of the Ramsay Lake feldspathic quartzite (Sudbury breccia type) is present locally.

Following similar topographic depressions along strike, it appears that the northerly phase of faulting postdates the east-northeasterly phase. This thought is supported by the fact that the northerly trending phase is capable of displacing the diabasic units, while the east-northeasterly trending phase does not, and is interpreted to be penecontemporaneous with the Nipissing intrusives.

Thus, from a preliminary view, the Structural-Depositional history appears to proceed as:

PHANEROZOIC

Cenozoic-Pleistocene and recent deposits (generally clay)

--- GREAT UNCONFORMITY ---

PRECAMBRIAN

PROTEROZOIC

late faulting (at least northerly phase)

Nipissing Intrusion - gabbro, pyroxenite with associated folding(?) and faulting(?)

--- Intrusive Contact ---

Huronian Supergroup

Hough Lake Group - Mississagi formation (absent)
- Pecors formation
- Ramsay Lake formation - upper
- lower

Elliot Lake Group - McKim formation
- Matinenda formation (absent - underlying?)

ECONOMIC GEOLOGY:

Most of the nickel, copper-nickel potential of the property has been discussed under Previous Work. To date, those shears and/or 'blowouts' within the Nipissing diabase dykes show practically no continuity either along strike or dip.

In assessing the uranium potential of the Huronian sediments, the location of the Archean basement and similarly the Matinenda formation are prime considerations. To that end, understanding the position of the Nipissing diabase dykes within the geological framework is crucial.

Joint patterns suggest that the Nipissing dykes dip northward. Thus, with depths of the Matinenda formation predicted to be at least 750 metres (Ginn 1965) below the Ramsay Lake-Pecors interface, it is doubtful that the Matinenda would be encountered before the diabase. It follows that since the structural elements associated with the intrusives are not fully understood, drilling through a dyke in hopes of encountering basal rocks would be risky.

Certainly with the presence of Agnew Lake Mines 15 km to the north, the potential of the area cannot be dismissed. On the other hand, there are several sections in the Sudbury-Espanola district where the Matinenda formation is absent - the McKim, Ramsay Lake, and locally the Pecors formation becoming the lowest Huronian member.

Based on the radiometric survey, two conditions of anomalous radioactivity exist on the property.

First, and of unknown significance, the lower member of the Ramsay Lake formation is two to three times the background of the overlying feldspathic quartzite.

Second, in three separate zones within the Ramsay Lake feldspathic quartzite, very anomalous radioactivity is found along narrow rusted fractures. The fractures are too small and too isolated to be of more than economic interest. The source of the radioactivity, however, is intriguing for the fractures are neither

continuous nor subparallel to any other geologic element. There is also no apparent association with diabase intrusion. Further, the best assay achieved was only .09% U_3O_8 over a matter of centimetres.

Thus, the economic potential of the property is not encouraging.

RESULTS OF THE ELECTROMAGNETIC SURVEY:

The field data for the VLF survey are plotted on the accompanying plan (see back pocket). Numerous anomalies were outlined during the course of the survey, most of which appear to be related to topography. Hence, those anomalies directly attributed to topography are indicated as such on the plan.

In general, the topographic anomalies are characterized by either long cross-over intervals and erratic quadrature responses or inflections of the in-phase component (positive or negative) with quadrature reversals.

The remaining anomalies or groups of anomalies (12 in all) are lettered 'A' to 'L' on the accompanying plan, and may be sub-divided into four groups as:

group 1 - anomalies A,E,F,G,H,J,K
group 2 - anomalies B,C,I
group 3 - anomaly D
and group 4 - anomaly L

The group 1 anomalies are interpreted to be related to topography as well, but with a geological component - be it either a fault association or a formational contact. The in-phase response is usually much stronger than seen in the aforementioned topographic anomalies. A and F are the possible exceptions within this group.

Anomaly A is a typical topographic profile, i.e. a long cross-over interval and a strong quadrature reversal. The geological

component for this feature is unknown, since there is no outcrop in the area.

The series of anomalies F are strong responses that similarly appear related to topography. The northeasterly trending dashed line, however, indicates an alternative for joining cross-overs on adjacent lines. This northeast trend follows the diabase-Ramsay Lake contact and may be a more valid interpretation.

The group 2 anomalies (B,C, and I) show moderate to strong responses subparallel to formational trends within the McKim sediments. The causes of the electromagnetic anomalies are uncertain and may be worthy of future consideration. Anomaly C in this group plots very near the McKim-diabase contact.

The group 3 anomaly (D) is a very weak anomaly localized within the Nipissing diabase. There is no geological evidence indicating the source of the anomaly and the response is too weak to warrant follow-up.

Group 4 consists of a number of anomalies (L) along XL 12W. The preliminary geology for this area suggests that a fault passes near this line and trends in a northerly direction. The cause of these anomalies may be due to a poor coupling with the fault plane.

In summary, the VLF survey outlines a number of anomalies, most of which have some element of topographic correlation. Unfortunately, the variance in relief across the property does not permit follow-up by more conventional types of EM without the problems of topographic interference.

To date, Fraser calculations have been carried out on part of the electromagnetic data to assist in discriminating anomalies and to simplify the presentation. Those data are not as yet complete.

RESULTS OF THE RADIOMETRIC SURVEY:

The results of the radiometric survey are shown on the accompanying plan (see back pocket). To simplify data presentation, only the total counts (T_1 scale) are plotted and subsequently contoured.

Most of the specifics that can be drawn from the survey are discussed under Economic Geology. In a general sense, the survey aids in delimiting changes in rock type, particularly the Nipissing diabase, lower Ramsay Lake, and upper Ramsay Lake units. Discriminating the Pecors-upper Ramsay Lake boundary, however, is much more tenuous.

Although the radiometric survey indicates that no further work is necessary, the relationship between scintillometer readings and rock units is a valuable comparative tool for future reference.

CONCLUSIONS:

The objective of the exploration programme had been to isolate areas of geological-electromagnetic-radiometric interest for future consideration. With an overview of the results, further work is not justified either in diamond drilling to basement rocks or in detailed follow-up of the radiometric survey.

January 10, 1979

D. R. Alexander

Dan R Alexander

HOLLINGER EXPLORATION

SELECTED BIBLIOGRAPHY

Baer, A.J. (editor)(1970) - Symposium on Basins and Geosynclines of the Canadian Shield; GSC Paper 70-40, pp. 143-158.

Card, K.G. (1976) - Geology of the Espanola-Whitefish Falls Area, Dist. of Sudbury; Ont. Div. of Mines Geoscience Rept. 131, acc. by maps 2311, 2312, Scale: 1:31,680.

Ginn, R.M. (1965) - Nairn and Lorne Townships, Dist. of Sudbury; ODM Geol. Rept. 35, acc. by map 2062, Scale: 1:31,680.

Assessment files - Resident Geologist's Office, Sudbury.

Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – 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(s) Geological

Township or Area Nairn Township

Claim Holder(s) Hollinger Mines Limited
Box 320, Timmins, Ont. P4N 7E2

Survey Company Hollinger Mines Limited

Author of Report Dale R. Alexander

Address of Author c/o Hollinger Mines Limited

Covering Dates of Survey July 4 to September 13, 1978
(linecutting to office)

Total Miles of Line Cut 1.85 miles (traversed)

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	
–Magnetometer	
–Radiometric	
–Other	
Geological	20
Geochemical	

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

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

DATE Jan.10,1979 SIGNATURE: Dale R Alexander
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
S	- 378778
S	- 397682

41165S8029 92141 NAIRN

900

If space insufficient, attach list

TOTAL CLAIMS 2

OFFICE USE ONLY

Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – 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(s) Radiometric (TV-1A)

Township or Area Nairn Township

Claim Holder(s) Hollinger Mines Limited
Box 320, Timmins, Ont. P4N 7E2

Survey Company Hollinger Mines Limited

Author of Report Dale R. Alexander

Address of Author c/o Hollinger Mines Limited

Covering Dates of Survey July 4 to September 13, 1978
(linecutting to office)

Total Miles of Line Cut 15.08 miles (traversed)

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	
–Magnetometer	
–Radiometric	(20)
–Other	Mag
Geological	
Geochemical	

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

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

DATE: Jan. 10, 1979 SIGNATURE: Dale R Alexander
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

File No.	Type	Date	Claim Holder

OFFICE USE ONLY

MINING CLAIMS TRAVERSED
List numerically

(prefix)		(number)
S	-	378777
S	-	378778
S	-	397682
S	-	398089
S	-	398090
S	-	398091
S	-	398100
S	-	398101
S	-	398102
S	-	425465
S	-	471440
S	-	471468
S	-	471469
S	-	471938
S	-	471939
S	-	471940 1/2
S	-	471941
S	-	471942
S	-	471943
S	-	471944
S	-	471945
S	-	471946 1/2

TOTAL CLAIMS 22

If space insufficient, attach list

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS – If more than one survey, specify data for each type of survey

Number of Stations 859 Number of Readings 917

Station interval 100' Line spacing 400'

Profile scale

Contour interval 1000 counts/min. with selected 500 counts/min.

MAGNETIC

Instrument

Accuracy – Scale constant

Diurnal correction method

Base Station check-in interval (hours)

Base Station location and value

ELECTROMAGNETIC

Instrument

Coil configuration

Coil separation

Accuracy

Method: ☐ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency (specify V.L.F. station)

Parameters measured

GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

INDUCED POLARIZATION RESISTIVITY

Instrument

Method ☐ Time Domain ☐ Frequency Domain

Parameters – On time Frequency

– Off time Range

– Delay time

– Integration time

Power

Electrode array

Electrode spacing

Type of electrode

Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – 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(s) Electromagnetic (VLF)

Township or Area Nairn Township

Claim Holder(s) Hollinger Mines Limited
Box 320, Timmins, Ont. P4N 7E2

Survey Company Hollinger Mines Limited

Author of Report Dale R. Alexander

Address of Author c/o Hollinger Mines Limited

Covering Dates of Survey July 4 to September 13, 1978
(linecutting to office)

Total Miles of Line Cut 15.08 miles (traversed)

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	
–Radiometric	
–Other	
Geological	
Geochemical	

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

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

DATE: Jan. 10, 1979 SIGNATURE: Dale R. Alexander
Author of Report or Agent

I.D.

Res. Geol. _____ Qualifications 2.142

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)		(number)
S	-	378777 ✓
S	-	378778 ✓
S	-	397684 ✓
S	-	398089 ✓
S	-	398090 ✓
S	-	398091 ✓
S	-	398100 ✓
S	-	398101 ✓
S	-	398102 ✓
S	-	425465 ✓
S	-	471440 ✓
S	-	471468 ✓
S	-	471469 ✓
S	-	471938 ✓
S	-	471939 ✓
S	-	471940 ½
S	-	471941 ✓
S	-	471942 ✓
S	-	471943 ✓
S	-	471944 ✓
S	-	471945 ✓
S	-	471946 ½

TOTAL CLAIMS 22

If space insufficient, attach list

OFFICE USE ONLY

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS – If more than one survey, specify data for each type of survey

Number of Stations 852 Number of Readings 852

Station interval 100' Line spacing 400'

Profile scale 1" = 40'

Contour interval

MAGNETIC

Instrument

Accuracy – Scale constant

Diurnal correction method

Base Station check-in interval (hours)

Base Station location and value

ELECTROMAGNETIC

Instrument Geonics EM-16 Serial #48

Coil configuration Horizontal receiver

Coil separation Infinity

Accuracy ± 1 degree

Method: ☒ Fixed transmitter ☐ Shoot back ☐ In-line ☐ Parallel line

Frequency 20 KHz Station NAA Cutler, Maine (specify V.L.F. station)

Parameters measured In-Phase and Quadrature

GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

INDUCED POLARIZATION RESISTIVITY

Instrument

Method ☐ Time Domain ☐ Frequency Domain

Parameters – On time Frequency

– Off time Range

– Delay time

– Integration time

Power

Electrode array

Electrode spacing

Type of electrode

SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

_____

Corrections made _____

_____

RADIOMETRIC

Instrument Scintillometer TV-1A Serial No. 176-88

Values measured Total counts per minute at 100 foot stations

Energy windows (levels) T_1 (total counts) - 2 Mev; T_2 1.6 Mev; T_3 2.5 Mev

Height of instrument At waist (3 m) Background Count 1000 cpm (for diabase)

Size of detector 1" in diameter, 1½" thick (Na I)

Overburden Varies from 0 - 30 m.
(type, depth -- include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

_____

Additional information (for understanding results) _____

_____

_____

AIRBORNE SURVEYS

Type of survey(s) _____

Instrument(s) _____
(specify for each type of survey)

Accuracy _____
(specify for each type of survey)

Aircraft used _____

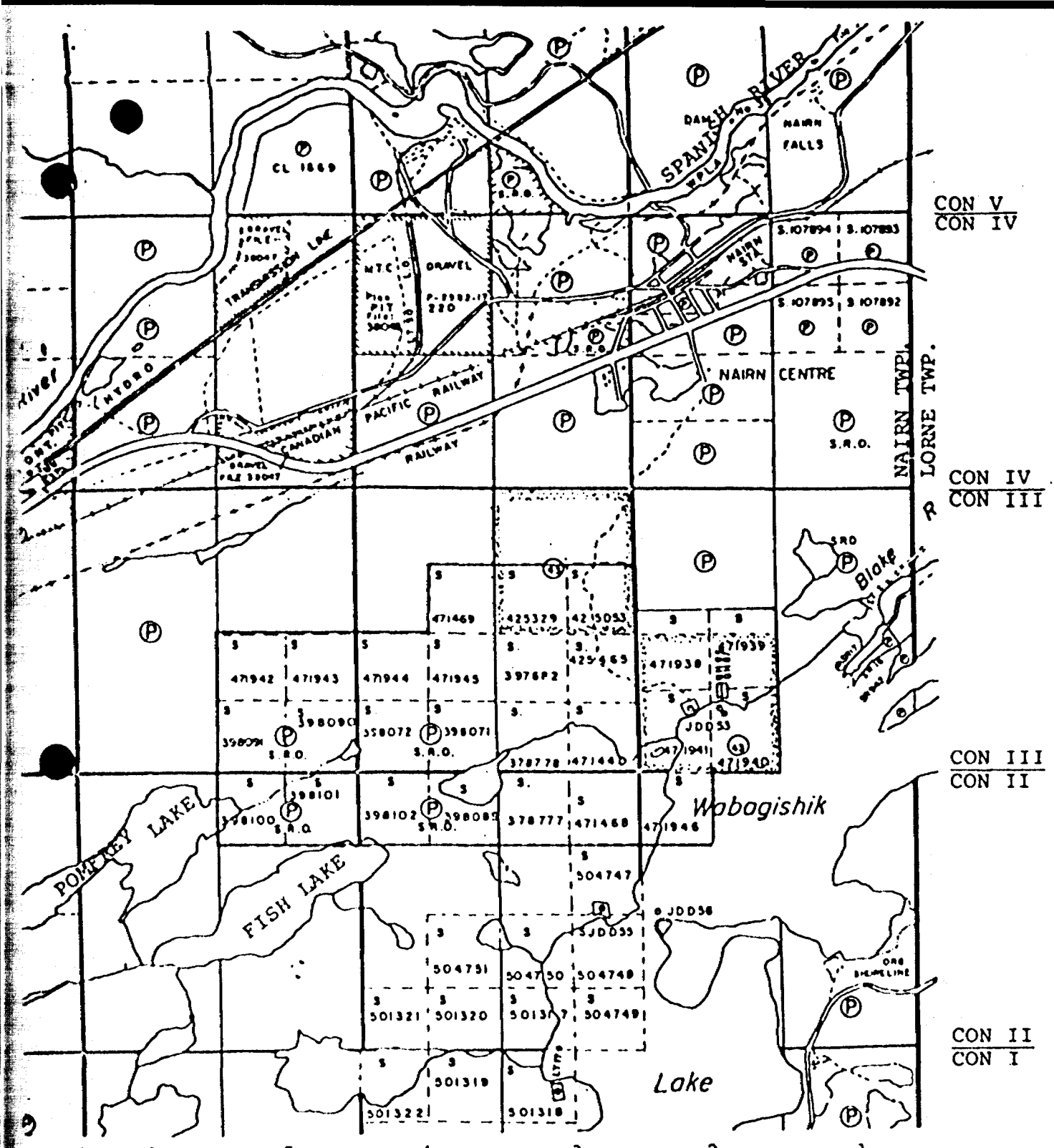
Sensor altitude _____

Navigation and flight path recovery method _____

_____

Aircraft altitude _____ Line Spacing _____

Miles flown over total area _____ Over claims only _____



CLAIM MAP

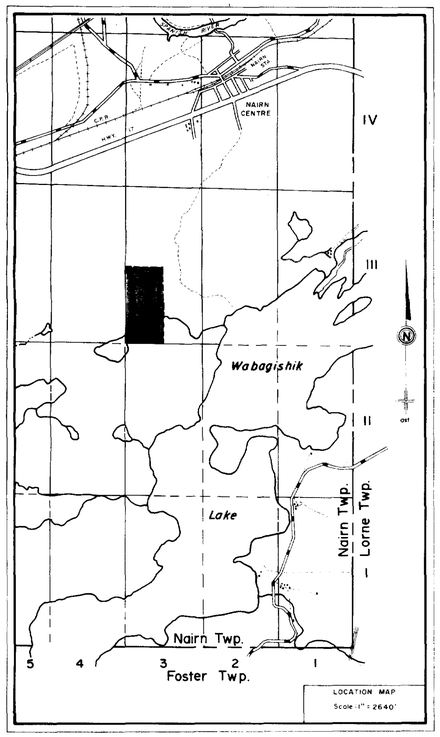
OUTLINING

NAIRN #1 GROUP

Scale = 1:31,680
(or 1" = 2640')

FOR ADDITIONAL INFORMATION SEE MAPS:

NAIRN-0021-AL #1-4



LEGEND

PRECAMBRIAN

PROTEROZOIC

Post Huronian Intrusives

SA1 Nipissing Diabase; Gabbro

Huronian Supergroup

PB Hough Lake Group

PB Pecors Formation: 5. Quartzite; 6. Argillite

PB Ramsay Lake Formation: 7. Conglomerate; 8. Quartzite

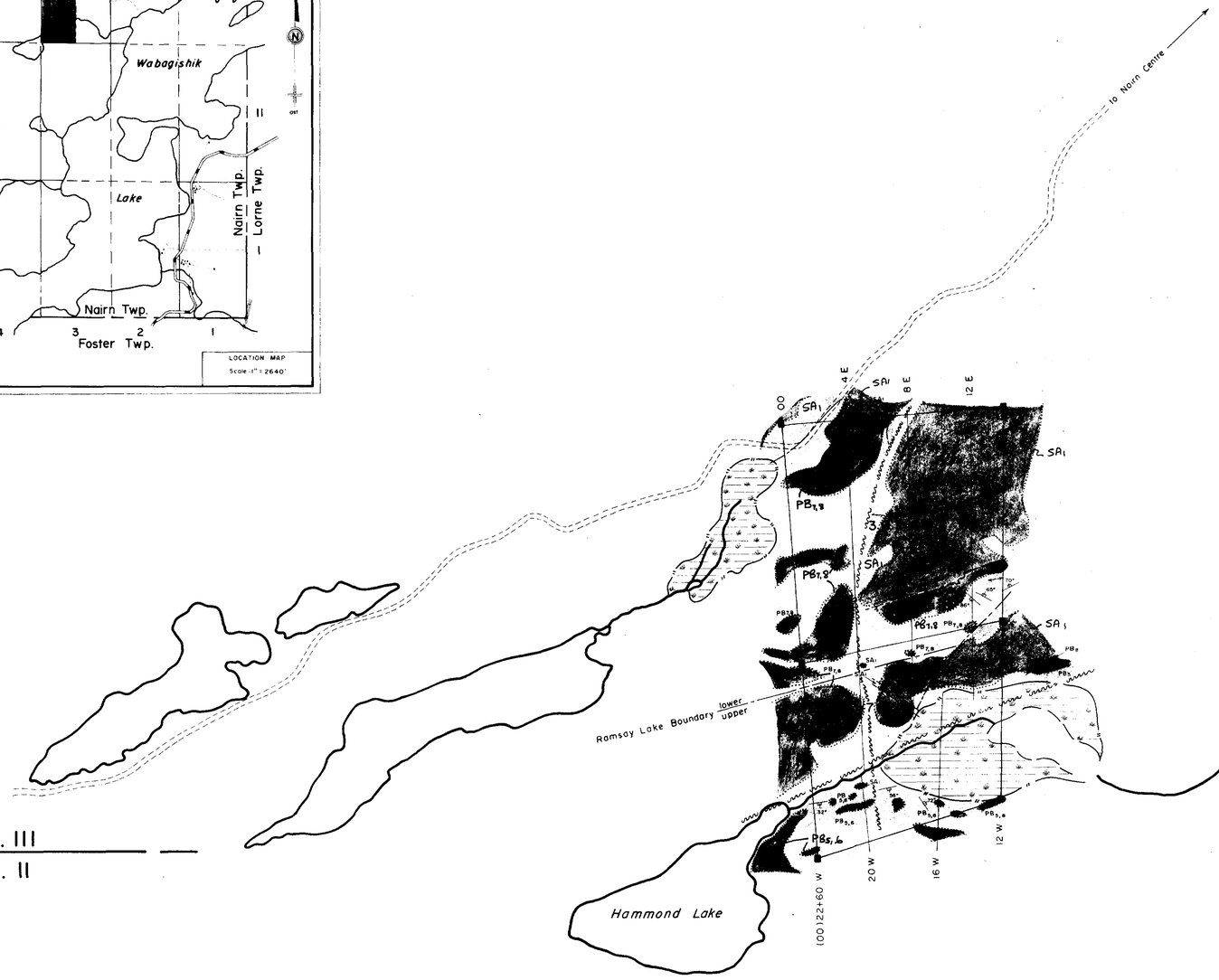
s Sulphides

Fault or Shear

Outcrop

Contact

Breccia (Sudbury Type)



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HOLLINGER MINES LTD.

GEOLOGY

NAIRN TWP.
(Rastall Option)

Scale: 1" = 400'
(1 : 4800)

Dave R. Alexander
HOLLINGER EXPLORATION

LEGEND

PRECAMBRIAN

PROTEROZOIC

Post Huronian Intrusives

SA_1 Nipissing Diabase; Gabbro

Huronian Supergroup

PB Hough Lake Group

PB Pecors Formation: 5. Quartzite; 6. Argillite

PB Ramsay Lake Formation: 7. Conglomerate; 8. Quartzite

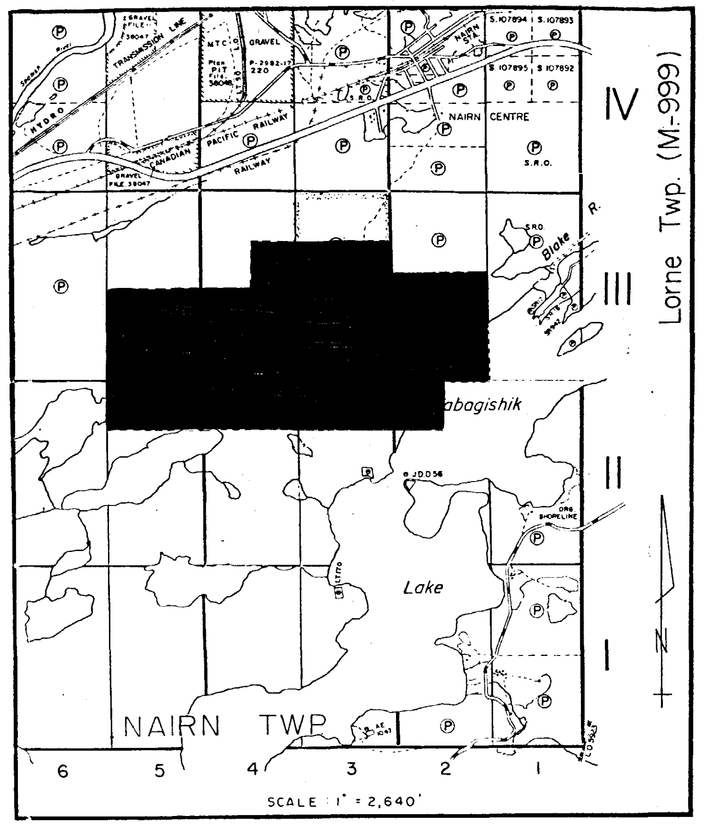
PA Elliot Lake Group

PA McKim Formation: 1. Argillite; 2. Quartzite; 3. Subgreywacke

Outcrop

Contact

Breccia (Sudbury Type)



to Nairn Center

CON. III
CON. II

Pomfrey Lake

Fish Lake

Hammond Lake

Wabagishik Lake

Lot 6 | Lot 5 | Lot 4 | Lot 3 | Lot 2 | Lot 1

N

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HOLLINGER EXPLORATION
AST.

HOLLINGER MINES LTD.

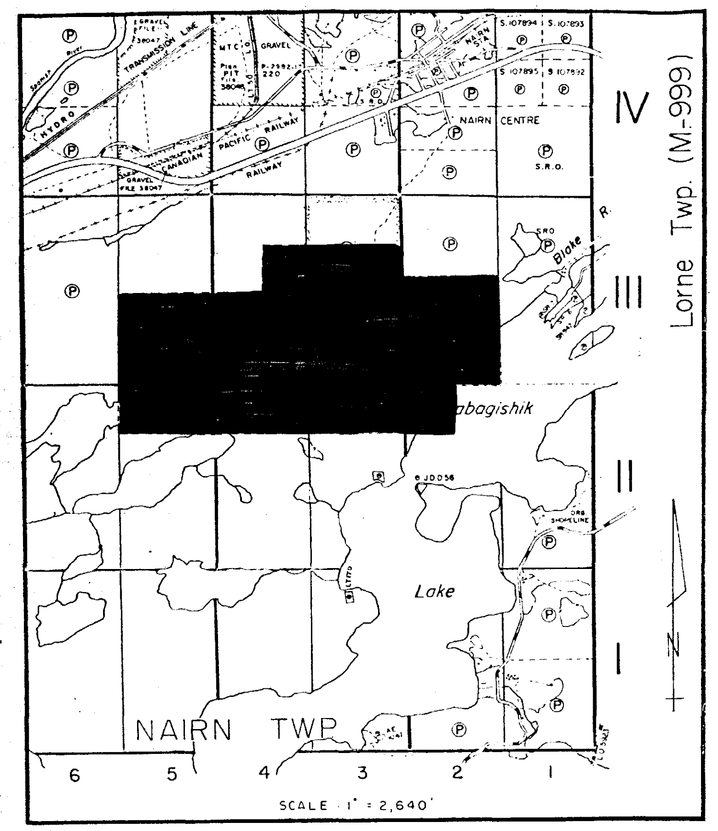
OUTCROP MAP

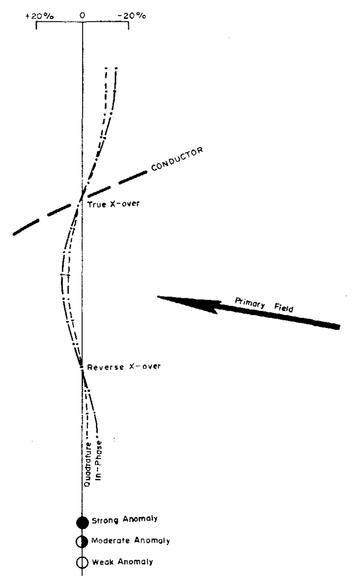
NAIRN TWP.

SCALE: 1" = 400' or 1 cm. to 48 m.

NAIRN-0021-A1-#2

210





HOLLINGER MINES LTD

V.L.F. (E.M.-16) SURVEY

Dave R Alexander

HOLLINGER EXPLORATION

NAIRN TWP.

SCALE: 1" = 400' or 1 cm. to 48 m.

NAIRN-0021-A1-#4