



42A10NE0020 2.3757 WILKIE

010

FEB 2 1981

MINING LANDS SECTION

REPORT ON  
AN AEROMAGNETIC SURVEY

IROQUOIS FALLS AREA  
ONTARIO

*L.D.*

AMAX MINERALS EXPLORATION

Timmins, Ontario  
February 1981

B. Groves  
Geophysicist



## INTRODUCTION

During the period August 20 to September 3, 1980, an airborne magnetometer survey was performed by Questor Surveys Limited for Amax of Canada Limited. The survey was flown over parts of Calvert, Teefy, Rickard, Wilkie, Walker and Clergue townships near Iroquois Falls, Ontario. The area flown was considered prospective in terms of known mineralization within this part of the Abitibi Greenstone Belt.

Key personnel present for the duration of the survey were:

B. Groves	Amax geophysicist
R. Roussain	Amax geologist
R. de Carle	Questor crew manager and geophysicist

## LOCATION OF SURVEY AREA

Figure 1 presents the location of the survey area which encompasses parts of Calvert, Teefy, Rickard, Wilkie, Walker and Clergue townships near the town of Iroquois Falls in northeastern Ontario.

## SURVEY SPECIFICATIONS, EQUIPMENT AND PROCEDURES

A total of 1242 line kilometres was flown along north-south oriented flight lines. Line spacing was 200 metres and an average terrain clearance of 122 metres was employed, this latter figure also being the elevation of the magnetometer sensor.

Survey equipment consisted of a Sonotek P.M.H. 5010 proton precession magnetometer, thirty five millimetre flight path camera, radar altimeters for vertical control and galvanometer type recorders using light sensitive paper. This system was installed in a Britten Norman Trislander fixed wing aircraft.

Survey navigation was based on photo-mosaics at a scale of 1:15000. Flight path recovery was accomplished by comparison of the 35 mm flight path film with the mosaic in order to locate fiducial points.

#### DATA REDUCTION AND PRESENTATION

The aeromagnetic data is presented in computer contoured plan form. A nominal contour interval of 20 gammas has been employed. No filtering has been carried out on the magnetic data.

The survey was flown as one block using a consistent north-south flight line direction. The aeromagnetic data is presented in Map 1 (western half) and Map 2 (eastern half) at a scale of 1:15000.

## EXPLORATION HISTORY

From available information, most past exploration activity was confined to the western half of the survey area and in particular, Calvert and Clergue townships.

Within Calvert township, the earliest recorded work was drilling performed by Quebec Asbestos Corp. in 1950 in Lot 12, concession V. Drill records indicate diabase and ultramafic intrusives were intersected. Metal Mines Ltd. performed ground magnetic and electromagnetic surveys in 1964 and subsequent drilling in 1965 over claims within Lots 6, 7 and 8, concession VI. Chalcopyrite, pyrrhotite and pyrite mineralization was encountered. In 1974, Falconbridge Nickel Mines performed magnetometer and electromagnetic surveys within Lots 8 and 9 of concessions IV and V. Favourable conductors were subsequently drilled in 1975 and pyrrhotite mineralization encountered. During 1974 and 1975, Inco drilled several holes within Lot 7, concession III. Ultramafics, graphitic metasediments and chert were encountered.

The majority of exploration effort within Clergue township has been concentrated on an ultramafic intrusive located south of Porquois Junction in Lots 9, 10, 11, 12 of concessions III and IV. Earliest recorded drilling was performed by Alexo Mining Company Ltd. in 1909 and subsequently in 1939 and 1943. Further drilling was performed by Dominion Gulf Co. (1949 - 1952), Selco Exploration (1960), Inco (1971 - 1973) and Falconbridge Nickel (1973). Available drill hole information reveal intersections of nickel, chromium, chalcopyrite, sphalerite, pyrrhotite, magnetite and asbestos in uneconomic quantities. In all cases of recorded drilling with the exception of Alexo Mining and Selco Exploration, prior ground geophysical surveys had been performed. Ground magnetometer and electromagnetic surveys were typical though Dominion Gulf performed additional I.P., S.P. and resistivity surveys in 1949.

## DISCUSSION OF RESULTS

Map 3 presents the contoured magnetic data at a scale of 1:50000 together with an interpretation of major magnetic trends and features. The most notable features are:

(i) Northerly trending diabase dykes

The magnetic map is dominated by northerly trending linear features which are interpreted to be due to diabase dykes. Magnetic gradients associated with the dykes and their relative spacing are such that more subtle east-west trending features have been largely suppressed. The majority of dykes have low to moderate magnetic relief (50-150 gammas). Several minor dislocations (100-200 metres) of the dyke responses suggest the presence of ENE trending faults. The most noticeable fault displacements occur between flight lines 10300S and 10320S (approximately 4.5 km ESE of Porquois Junction) and between lines 10620S and 10750N (approximately 7 km SSW of Iroquois Falls).

(ii) East-west trending iron formations

These units give rise to narrow linear features of moderate to high magnetic relief (200 - 500 gammas). A major formation appears to extend the full width of the southern half of the survey area, though the magnetic expression of this feature becomes more diffuse towards the western end due to greater local magnetic relief. Several minor dislocations (up to 200 metres) of this unit can be discerned suggesting the presence of NE trending faults. A more pronounced displacement (600 metres) is observed towards the eastern end of the formation and a northerly trending fault can be inferred.

A second less strike extensive iron formation can be recognized to the north of the major formation, extending almost the width of the western half of the survey area. One minor dislocation is observable suggesting the presence of a NNE trending fault.

(iii) Ultramafic intrusives

Two sub-circular zones in the extreme NW and SW corner respectively of the survey area display the greatest local magnetic relief (up to 5000 gammas). Causative sources of these features are believed to be ultramafic intrusives, drilling performed by Quebec Asbestos Corp. and Dominion Gulf Co. near these features having intersected peridotite, and ultramafic and serpentinized rocks. A broad fold structure can be identified within the magnetic texture of the southern zone. This may be due to a folded mafic metavolcanic unit which was intersected in holes drilled by Falconbridge Nickel.

(iv) Mafic intrusives and volcanics

The remaining features of moderate magnetic relief (200 to 300 gammas) are broader east to north east trending zones largely restricted to the western half of the survey area. These zones are thought to be the response to mafic (gabbroic) intrusives and some mafic volcanic flows. The trend of the intrusives is best displayed in the NW quadrant of the survey area directly west of Iroquois Falls. While mafic rock types are believed to be the primary source of the magnetic features observed, the more elongated magnetic responses suggest the limited presence of iron formations.

Mafic intrusives elsewhere in the survey area manifest themselves as isolated oval shaped magnetic expressions.

(v) Felsic intrusives and meta-volcanics

Several very broad oval shaped magnetic lows occurring within the survey area may be the response to felsic intrusives and meta-volcanics. The best magnetic expression of these units occurs within the north western quadrant of the area. The magnetic lows lying 2.5 kilometers NW of Iroquois Falls and flanking the ultramafic intrusive in the NW corner of the area have been drilled and felsic intrusives intersected. While no geological information is available, it is believed that the very broad magnetic low along the central western boundary may be attributed to a similar source. With the exception of the broad lows between lines 10780N and 10950N, it is

difficult to ascribe a similar interpretation to other elongated magnetic lows due to a paucity of geological information and the probable masking effect of the magnetic gradients associated with the series of northerly trending dykes.



## CONCLUSIONS

The aeromagnetic survey has outlined several features which may be related to certain geologic rock types. Most importantly, the survey has detailed the existence of numerous northerly trending diabase dykes, the magnetic responses of which, dominate the magnetic contour map.

Iron formations and mafic intrusives and volcanics defined by the survey reveal an easterly to north easterly regional strike which has been complicated in the north western and south western corners of the survey area by ultramafic intrusives. Within the northeastern quadrant of the survey, strike is poorly defined due to the presence of diabase dykes and the lack of geologic units of more pronounced magnetic relief.

Faulting has been inferred in several areas from displacements observed in magnetic trends related to dykes and iron formations. In most cases, displacements are minor, being typically 200 metres.

While the presence of numerous dykes within the survey area has complicated the interpretation of the magnetic data, regional geological correlations can still be made and should aid in ground geological investigations.

Respectfully submitted,

*original  
file*

*B. J. Groves*

Brian Groves  
Geophysicist

APPENDIX A

SCHEDULE OF CLAIMS

PROJECT 1131

Claim Group	Township	Number	Claim Numbers	Recording Date
1131-01	Calvert	8	P-583137	September 3, 1980
			P-583138	" " "
			P-583139	" " "
			P-583140	" " "
			P-583141	" " "
			P-583142	" " "
			P-583143	" " "
			P-583144	" " "
1131-02	Calvert	8	P-583153	September 3, 1980
			P-583154	" " "
			P-583155	" " "
			P-583156	" " "
			P-583157	" " "
			P-583158	" " "
			P-583159	" " "
			P-583160	" " "
1131-03	Calvert	4	P-583149	September 10, 1980
			P-583150	" " "
			P-583151	" " "
			P-583152	" " "
1131-04	Calvert	4	P-583145	September 3, 1980
			P-583146	" " "
			P-583147	" " "
			P-583148	" " "
1131-05	Clergue	3	P-583134	September 3, 1980
			P-583135	" " "
			P-583136	" " "
1131-06	Clergue	4	P-583130	September 3, 1980
			P-583131	" " "
			P-583132	" " "
			P-583133	" " "
1131-07	Clergue	4	P-583126	September 3, 1980
			P-583127	" " "
			P-583128	" " "
			P-583129	" " "

Claim Group	Township	Number	Claim Numbers	Recording Date
1131-08	Calvert	4	P-583161	September 3, 1980
			P-583162	" " "
			P-583163	" " "
			P-583164	" " "
1131-09	Walker	8	L-583759	September 10, 1980
			L-583760	" " "
			L-583761	" " "
			L-583762	" " "
			L-583763	" " "
			L-583764	" " "
			L-583765	" " "
L-583766	" " "			
1131-10	Walker	4	L-583755	September 10, 1980
			L-583756	" " "
			L-583757	" " "
			L-583758	" " "
1131-11	Calvert	4	P-598948	January 28, 1981
			P-598949	" " "
			P-598950	" " "
			P-598951	" " "
1131-12	Calvert	4	P-578000	February 23, 1981
			P-583165	" " "
			P-598952	" " "
			P-598953	" " "

Total Number of Claims - 59



190200


190100

190200

190100




Map 1  
Magnetic Contour Map (west half)



200  
AMAX MINERALS EXPLORATION

**IROQUOIS FALLS AREA**  
MAGNETIC FIELD  
ISOMAGNETIC INTERVAL  
(TOTAL FIELD)

- 1000 GAUSS - CONTOUR LINE
- 500 GAUSS - CONTOUR LINE
- 250 GAUSS - CONTOUR LINE
- 125 GAUSS - CONTOUR LINE



1:50,000 SCALE  
MAY 1968

