REPORT ON

AIRBORNE GEOPHYSICAL SURVEY

IN THE

REAUME - HANNA TOWNSHIP AREA OF ONTARIO

FOR

BRASCAN RESOURCES LIMITED

BY

KENTING EARTH SCIENCES LIMITED

PROJECT NO. 74125

OTTAWA, ONTARIO,
February 19, 1975

Robert W. Stemp, P.Eng.,
Chief Geophysicist.

Kenting

Accompanying this Report:-

- Two Plan Maps of scale 1" to 1320'.

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REPORT ON AIRBORNE GEOPHYSICAL SURVEY IN THE REAUME - HANNA TOWNSHIP AREA OF ONTARIO FOR BRASCAN RESOURCES LIMITED

I. INTRODUCTION

This report pertains to the combined airborne electromagnetic and magnetic survey carried out in the Reaume - Hanna township area of Ontario for Brascan Resources Limited. The survey was conducted between February 1st. and 5th., 1975, by Kenting Earth Sciences Limited geophysically equipped Canso aircraft (registration CF-JJG) based at Timmins.

The survey was flown at a mean terrain clearance of 150 feet with flight lines spaced at 1/8 - mile intervals. All traverses were oriented north-south. The geophysical data acquired totalled 348 line miles.

The following Kenting personnel were associated with this project:

P.	Korpatt	Pilot
G.	Roos	Co-pilot/navigator
R.	Kupkee	Geophysical operator
G.	Richardson	Data Compiler
D.	Fitzsimmons	Data chief
G.A.	Curtis	Geophysicist
R.W.	Stemp	Chief geophysicist.

The EM results are presented on two plan maps of scale 1" to 1320'. An uncontrolled airphoto laydown provided the base for these maps.

A complete description of the equipment plus survey and compilation procedures is appended to this report.

II. GEOLOGY

The following publication of the Ontario Division of Mines is used as a reference in this report:

Map 2205: Timmins - Kirkland Lake - Scale 1 inch to 4 miles.

The survey area is heavily drift covered and thus the geological presentation in this area is based primarily on aeromagnetic interpretation together with some drill hole information.

Intermediate and mafic metavolcanics are indicated throughout the survey area together with a number of mafic or ultramafic intrusives. Considerable faulting is also indicated. Specific geological references will be made in the interpretation section of this report which follows.

III. DISCUSSION OF RESULTS

A large number of bedrock conductors were detected within this rather small survey area. With the exception of the most northerly zones, burial depths greater than 100 feet should be expected possibly extending to 300 feet in certain areas. Thus ground follow-up should be carried out with great care.

(a) Sheet 1

Conductor 1 is a long, multiple zone that is still open to the west. It is situated along the southern contact of a strong magnetic feature which is mapped as a mafic intrusive. This zone appears to split into two separate zones to the east. Anomaly amplitudes and conductivities are quite high throughout the system with the strongest geophysical response on traverse 1. Either massive sulphides or graphite could account for this conductivity. Anomalies 5E and 8G appear to coincide with the magnetic peak and definitely warrant ground checking.

Conductor 2 parallels zone 1 to the south. Ground follow-up should centre on anomaly 7C as the eastern half of this zone exhibits very low conductivity which could be from surficial material.

Anomaly 2B is very weak but there is an indication on the records that it actually connects with zone 2 and may in fact correlate with anomaly 1B. This area should be carefully examined on the ground.

Conductor 3 appears to be an extension of the southern limb of zone 1 but is definitely off-set from it. A fault probably separates these two zones. Conductivity is high within this zone which becomes a multiple system to the east. Conductor 4 is also apparently related to this group of anomalies. Graphitic sediments may be present in this region but since sulphides are reported on the geological reference map, systematic ground checking should be warranted.

Conductor 5 lies north of the survey boundary and is a good massive sulphide prospect. It appears to be situated within a narrow "window" in the mafic intrusives.

Conductors 3, 4, and 5 are all terminated in the vicinity of traverse 25 by a north-south striking fault which is indicated on the geological reference map.

Conductor 6 is an excellent massive sulphide prospect situated east of the fault zone. It is short, exhibits good conductivity, and coincides with a local magnetic anomaly of moderate amplitude.

Anomaly 31A is also an excellent sulphide prospect which appears to be isolated but may possibly be related to conductor 6. The location of this anomaly may be slightly in error as no identifiable, nearby point could be located on the 35 mm. film.

Anomaly 25A is very weak and may just be a surface feature. However, a very deep conductor could give the same geophysical expression.

Conductors 7 and 8 as presented on the plan map may be misleading as the only definite bedrock anomalies are 4A, 5C and 5D. The other anomalies may be entirely due to surface conductivity or noise. Thus there is a possibility of a different strike direction somewhat parallel to the flight lines. Nevertheless, ground follow-up should be centred on the definite bedrock anomalies.

Anomaly 8D is a possible noise feature.

Anomaly 15B is a single-line feature situated on the north side of a mafic intrusive. However, surface conductivity could be the source of this anomaly.

Anomaly 24B is very weak but definitely warrants a ground check as it may indicate a very deep conductor.

Conductor 9 is a definite bedrock zone. Although it is broad, it exhibits good conductivity and is associated with a magnetic feature. It may represent massive sulphides at a considerable depth. Anomaly 8B may be related to this zone but could also be a noise feature.

Conductor 10, to the east, is weak but anomaly 17C has a good chance of being a bedrock response and should definitely be checked out on the ground.

Anomalies 14B and 24A are probable noise features.

Conductor 12, which lies further east, will be discussed in conjunction with Sheet 2.

Conductor 11 is a definite bedrock zone situated near the southern survey boundary. Anomaly correlation is somewhat uncertain to the west, but there appears to be some definite folding. This conductor parallels the southern contact of a mafic intrusive. Anomaly 12A should also be checked out although it is classed as an X-type or doubtful feature.

Anomalies 5A and 17B are also doubtful but could be good prospects at depth and therefore warrant a ground investigation.

(b) Sheet 2

Conductive zones 12 and 13 are probably related although the geophysical results indicate a possible break between the two zones. The length of this horizon indicates the possibility of graphitic sediments. This conductor is probably quite deep and initial ground checking is recommended on anomaly 52B which gave one of the strongest airborne responses. Once the source of the conductivity is determined, more extensive ground follow-up may be warranted.

From a geophysical standpoint, conductor 14 looks very similar except for its length. Its source should determined.

Anomaly 59A is a possible noise feature.

Anomaly 61B could not be correlated with the long conductor (i.e. 16) to the east. It is magnetic and must be considered a good sulphide prospect.

Conductors 15 and 16 are two long parallel zones with some associated magnetic expression. Since copper and zinc mineralization is reported in this region, a careful ground investigation is recommended.

Conductor 17 parallels zone 16 but is short and extremely weak. However, it appears to be a bedrock feature and should be examined on the ground.

Anomaly 85A is questionable but it is situated near the mapped granite contact and may warrant a ground check.

Anomaly 81A is a possible surface conductor although geologically it sits near the nose of a mafic intrusive.

Anomaly 78A is questionable and probably due to turbulence.

Conductors 19 and 20 are both rather poorly defined. However, anomalies 58A, 60A and 60B are all bedrock possibilities and should be checked out.

Zone 18, to the west, is well defined and a definite bedrock conductor. Thus, it is given a higher priority rating than zones 19 and 20. Conductor 18 is non-magnetic.

Anomaly 38A is an X-type or doubtful bedrock feature.

Conductor 21 appears to be short and weak but is believed to be a very deep bedrock conductor that is masked by the conducting overburden. It is a good prospect.

Conductor 22 is less definite but is rated highly because of some localized magnetic activity associated with this zone.

Anomaly 53C may represent a surface or a deep bedrock conductor.

Anomaly 39C, however, is a definite bedrock feature. Although it appears isolated, it could possibly be an extension of the conductivity mapped further east. It is a good sulphide prospect.

Conductors 23, 24 and 25 are all definite bedrock conductors which must be checked out on the ground. The latter two zones may form a continuous system on the ground.

Anomaly 55C lies along strike to the east which may indicate a continuance of this conductive horizon. However, on the basis of the airborne survey it must be treated as a separate, isolated anomaly. It coincides with a 20 gammas magnetic anomaly and is a top priority massive sulphide prospect.

Conductor 26 is situated further east along strike and is also considered an excellent massive sulphide prospect.

Anomaly amplitudes are very low in zone 28, but it is also rated as a top priority prospect by the writer.

Anomaly 43C in zone 27 may be a noise feature but anomaly 42C looks legitimate and should definitely be checked out on the ground.

IV. RECOMMENDATIONS AND CONCLUSIONS

The airborne survey was very successful in detecting a large number of bedrock conductors beneath a thick layer of conducting overburden. Due to this overburden, anomaly amplitudes are very low and in some cases reach a limiting point where there is some doubt about their validity. It is possible that under extreme overburden conditions some anomalies were missed and thus on the ground some conductors may prove to be longer than shown.

On the basis of the airborne results, conductors 5, 6, 9, 22, 26 and 28 together with single-line anomalies 31A, 39C, 55C, and 61B are given top priority.

Second priority is given to conductors 1, 2, 3, 4, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 23, 24, 25, and 27.

All other conductors or anomalies are rated lower as they are not definite bedrock features.

Respectfully submitted,

R. W. Stemp

OTTAWA, ONTARIO, * Qualifications 63.1989
February 19, 1975.

Robert W. Stemp, P.Eng.
Chief Geophysicist.

PROJECT NO. 74125 - REAUME-HANNA TOWNSHIP AREA

Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
1A	4267/9	15/10	140	NIL	X	Turbulence noise?
B	4230/3	35/60	160	S. Side 600g	3	
C	4227/30	130/120	165	S. Flank 600g	2B	
2A	3975/7	20/10	150	NIL	X	
B	3939/41	15/25	145	S. Side 550g	3	Surface?
C	3933/6	50/40	200	S. Edge 550g	3	
3A	4544/6	10/10	120	NIL	X	
B	4502/4	25/40	130	S. Flank 450g	3	
4A	4840/2	25/25	125	NIL	3	
B	4834/7	20/20	135	N. Flank 15g	3	
C	4797/800	40/35	150	S. Flank 1300g	3	
5A	4661/3	15/25	170	NIL	X	
B	4708/11	25/20	120	N. Flank 90g	3	Broader Quadra ture
C	4720/3	45/40	135	S. Flank 10g	3	
D	4725/8	45/30	120	NIL	3	
E	4765/7	30/40	185	Direct 1000g	3	
6A	4138/43	50/30	165	Assoc. 10g	3	Broad
B	4152/5	10/25	155	NIL	3	Surface?
C	4185/9	30/15	130	NIL	3	Double
D	4194/8	45/45	160	S. Edge 950g	3	Double

Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
7A	4425/30	40/30	145	S. Flank 30g	3	Broad
B	4439/42	15/25	125	NIL	3	Surface?
C	4471/4	50/25	135	NIL	3	
D	4482/6	75/55	180	S. Edge 900g	3	Double
8A	3856/61	45/25	145	S. Flank 50g	3	
B	3862/4	20/15	135	N. Flank 50g	X	
C	3871/3	15/10	145	NIL	X	
D	3889/93	25/15	140	NIL	X	Poor character
E	3904/7	30/30	130	NIL	3	
F	3913/5	25/50	160	S. Flank 1700g	3	
G	3915/7	60/50	150	Direct 1700g	3	
9A	3572/7	40/35	125	Assoc. 100g	3	Double?
B	3621/4	15/35	135	NIL	3	Surface?
C	3629/33	35/60	135	S. Flank 2300g	3	Double
10A	3264/6	20/20	125	Direct 15g	3	
B	3311/5	15/70	130	NIL	3	Surface?
C	3319/22	60/60	130	S. Side 1400g	3	
D	3323/5	15/25	125	S. Edge 1400g	3	Weak
11A	3011/4	0/30	125	NIL	3	Surface?
B	3016/20	30/35	170	NIL	3	
C	3022/5	15/25	130	S. Side 4700g	3	Weak

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Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
12A	2621/4	30/10	130	NIL	X	Turbulence noise?
B	2629/32	30/40	130	NIL	3	
C	2738/42	30/35	150	NIL	3	Broad
D	2747/50	15/30	120	S. Side 7300g	3	
13A	2313/5	30/30	145	NIL	3	
B	2317/9	25/20	145	S. Flank 240g	3	
C	2432/5	30/25	135	NIL	3	
D	2440/2	25/30	125	S. Side 6200g	3	
14A	2006/9	20/10	150	NIL	3	
B	2074/6	20/15	145	S. Edge - S. Peak 20g	X	
C	2126/9	75/50	175	S. Edge 1600g	3	
D	2136/9	0/25	135	S. Flank 6000g	3	
15A	3779/82	25/35	130	NIL	3	
B	3699/702	30/35	165	N. Side 3300g	3	Surface?
C	3664/8	75/50	145	S. Side 2800g	3	Double
16A	3485/8	30/30	165	NIL	3	
B	3366/9	45/40	165	S. Flank 1600g	3	
17A	3171/4	40/35	175	NIL	3	
B	3161/3	25/10	170	NIL	X	Turbulence noise?
C	3110/3	15/25	140	S. Side 1300g	3	
D	3051/4	75/35	165	S. Side 1200g	3	

PROJECT NO. 74125 - REAUME-HANNA TOWNSHIP AREA

Anomaly	Fiducial	In-Phase Quad	Altitude	Magnetics	Rate	Comments
18A	2891/3	20/25	170	NIL	3	
B	2831/4	10/10	150	S. Side 1100g	X	Turbulence noise?
C	2769/73	130/50	155	S. Side 6500g	3	Double
19A	2589/92	35/30	150	NIL	3	
B	2468/72	85/50	170	S. Side 7100g	3	Double
20A	2287/91	30/25	155	NIL	3	
B	2173/7	45/30	135	N. Flank 160g	3	Double
C	2167/73	55/35	135	S. Side 2900g	3	Double
21A	1873/7	80/35	130	N. Side 360g	3	
B	1869/73	45/45	130	S. Side 2600g	3	Double?
22A	1598/602	70/35	135	NIL	3	Double
B	1580/2	30/15	180	N. Flank 650g	3	
23A	1318/22	100/50	190	NIL	2B	
B	1314/7	60/45	185	Direct 40g	3	
C	1310/3	25/35	180	NIL	3	
D	1297/300	120/40	175	N. Flank 1000g	2B	
E	1294/7	50/30	190	S. Side 2900g	X	In turn?
24A	1101/3	25/10?	135	N. Edge 240g	X	Probable Turbulence
B	1083/5	15/15	180	N. Edge 200g	3	Weak
C	1047/51	60/35	180	N. Side 2500g	3	Double?
D	1043/7	75/35	185	Direct 350g	3	
E	1039/42	40/25	190	N. Side 350g	3	

PROJECT NO. 74125 - REAUME-HANNA TOWNSHIP AREA

Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
24E	1026/9	60/25	175	N. Flank 1300g	3	
25A	0754/8	20/20	210	N. Side 2900g	3	
B	0750/4	15/25	190	S.Edge 1800g	3	
C	0743/5	15/10	200	NIL	3	
D	0731/4	35/15	195	N. Flank 1600g	3	
26A	0473/5	15?/20	185	S. Side 1800g	3	Surface conductor?
29A	1552/5	25/20	175	Direct 90g	3	
30A	1283/5	30/15	170	Direct 30g	3	
31A	0989/91	40/35	175	N. Side 1900g	3	
32A	0640/2	10/10	150	NIL	3	Weak
33A	0354/6	20/30	145	NIL	3	
34A	0059/62	25/25	130	NIL	3	
35A	1764/72	30/25	145	NIL	3	Broad - Part noise?
36A	1476/83	25/20	135	Assoc. 20g	3	Broad - Part noise?
37A	1212/4	20/15	145	S. Flank 20g	3	
38A	0901/4	20/10	170	NIL	X	
B	0916/8	25/15	175	S. Edge 35g	3	
C	0928/31	25/15?	125	S. Flank 150g	X	Noise?
39A	0626/9	25/20	155	S. Edge 20g	3	
B	0640/2	25/25	150	S. Flank 220g	3	
C	0653/5	25/25	160	N. Edge 100g	3	

PROJECT NO. 74125 - REAUME-HANNA TOWNSHIP AREA

Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
42A	1636/9	20/0	120	NIL	3	
B	1597/9	20/10	130	Direct 15g	3	
C	1563/6	30/25	115	NIL	3	
43A	1356/8	15/20	135	NIL	3	
B	1320/3	20/20	120	NIL	3	
C	1278/81	30/0	165	N. Flank 40g	X	Possible turbulence
44A	1075/9	25/30	135	NIL	3	Surface?
B	1064/7	20/20	110	NIL	3	
C	1041/3	15/25	150	NIL	3	
D	1035/8	25/25	155	NIL	3	
45A	0780/3	25/25	130	NIL	3	Surface?
B	0769/71	20/25	115	NIL	3	
C	0745/9	35/15	150	NIL	3	
D	0740/3	35/0	120	NIL	3	
46A	0510/2	15/15	135	NIL	3	Weak
B	0469/72	20/15	160	NIL	3	
47A	0199/204	30/25	175	NIL	3	Double
48A	5549/54	25/35	140	NIL	3	Double
B	5514/6	20/10	165	S. Edge 15g	3	
49A	5239/43	50/35	130	S. Flank 15g	3	Double
B	5202/4	25/25	145	N. Side 220g	3	
C	5175/8	20/10	140	NIL	3	

PROJECT NO. 74125 - REAUME-HANNA TOWNSHIP AREA

50A	4984/7	20/10?	135	NIL	X	Possible turbulence
B	4960/3	35/30	130	N. Flank 100g	3	
C	4923/6	15/20	155	N. Edge 140g	3	
D	4896/8	10/10	140	NIL	3	Weak
51A	4697/701	35/25	125	NIL	3	Double
B	4669/73	35/25	125	NIL	3	Double
C	4609/11	15/15	145	S. Flank 60g	3	
52A	4390/4	20/15	140	NIL	3	
B	4359/62	50/20	160	NIL	3	
C	4303/5	10/0	150	S. Side 450g	X	
53A	4101/4	20/15	135	NIL	3	
B	4069/72	20/10?	160	NIL	X	
C	4053/6	15/20	125	S. Side 330g	3	Weak
54A	3823/5	25/20	125	NIL	3	
B	3799/803	25/25	150	NIL	3	Double
C	3786/90	25/40	150	Assoc. 20g	3	
55A	5368/71	30/35	130	NIL	3	
B	5379/85	35/30	125	N. Side 40g	3	Double
C	5412/5	15/10	125	Direct 20g	3	
56A	5070/6	30/25	130	S. Edge 15g	3	Broad
57A	4792/5	20/15	170	NIL	3	
58A	4456/8	25/15	180	N. Side 5000g	3	
B	4496/8	15/15	165	NIL	3	Weak

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Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
59A	4196/9	20/15	130	NIL	X	Turbulence noise?
60A	3869/72	25/20	210	N. Side 1400g	3	
B	3881/4	30/35	175	NIL	3	
C	3951/3	30/10	130	N. Flank 500g	3	
61A	3611/3	15/0	150	NIL	X	
B	3650/2	20/20	150	Direct 10g	3	
C	3680/2	20/20	135	N. Side 500g	3	
63A	3097/101	30/30	165	Direct 60g	3	
64A	2818/20	30/0	200	Assoc. 25g	3	
65A	2536/9	15/0	145	NIL	X	
66A	2253/5	15/20	130	NIL	3	Weak
B	2260/2	25/20	180	S. Edge 10g	3	
C	2265/7	35/25	190	NIL	3	
67A	1992/4	15/10	150	NIL	3	Weak
B	1998/2001	40/15	150	N. Edge 20g	3	
C	2003/6	40/20	150	S. Flank 30g	3	
68A	3520/4	35/20	120	S. Edge 30g	3	Double?
B	3512/7	20/0	135	S. Edge 60g	X	
69A	3253/6	50/35	130	S. Edge 20g	3	
B	3241/7	25/30	125	N. Edge 40g	3	Broad
70A	2963/6	40/15	150	S. Edge 20g	3	
B	2952/6	25/25	145	Assoc. 20g	3	Broad

PROJECT NO. 74125 - REAUME-HANNA TOWNSHIP AREA

Anomaly	Fiducials	In-Phase Quad	Altitude	Magnetics	Rate	Comments
71A	2683/5	25/20	135	NIL	3	
B	2674/7	20/25	150	N. Side 40g	3	Possibly broader
72A	2400/2	20/15	150	NIL	3	
B	2391/3	25/25	140	N. Side 70g	3	Possibly broader
73A	2138/41	25/10	145	NIL	3	
B	2130/3	20/20	150	N. Flank 30g	3	
74A	1877/80	25/15	150	NIL	3	
B	1870/3	25/20	175	N. Flank 30g	3	
75A	1603/5	15/10	185	NIL	3	
B	1593/7	20/10	165	N. Flank 15g	3	
76A	1341/4	25/20	175	S. Edge 25g	3	
77A	1085/9	40/30	160	N. Edge 15g	3	
78A	0856/8	20/15	150	S. Side 1100g	X	Turbulence noise?
B	0827/30	25/15	170	NIL	3	
79A	0564/7	25/25	160	NIL	3	
80A	0286/8	20/15	190	NIL	3	
81A	1681/4	25?/30	175	S. Flank 3000g	3	In-Phase possible turbulence noise
85A	0667/70	20/0	165	NIL	X	Turbulence?

APPENDIX II

A. EQUIPMENT

The electromagnetic unit and magnetometer are key instruments in the Kenting Earth Sciences Limited Canso survey system. The remainder of the equipment consists of a radar altimeter, an accelerometer, a continuous-strip camera, two recorders, a fiducial numbering system and a 60 cycle noise detector.

The EM unit is the former Canadian Aero Service Limited MARK III low frequency (390 c.p.s.) in-phase/out-of-phase system. The transmitting coil is mounted forward of the nose of the aircraft and the receiving coil is housed inside the distal end of a tail stinger. The coil orientation is vertical coaxial (i.e. both coils have a common horizontal axis).

An electronic null device is adjusted so that in the absence of a conductor within the range of the system no signal is recorded. The anomalous signal is divided into two components, an in-phase component having the same phase as the transmitted field, and an out-of-phase or "quadrature" component which is at right angles to the transmitted field. Because of the time constant used in the electromagnetic unit the EM in-phase and quadrature signals are delayed by about one second. This is taken into account when plotting anomaly positions. The two signal components are continuously recorded on two channels of the six channel rectilinear recorder.

The magnetometer used in the survey was the total intensity MARK III Fluxgate saturable core instrument, developed by Gulf Research and Development Company and installed in a fibreglass housing below the tail stinger of the aircraft.

Output of the magnetometer is presented as one channel on the six channel rectilinear recorder to facilitate correlation with EM traces. It is also presented at a larger scale on a Gulf Research and Development rectilinear recorder with 10 inch chart width.

Five sensitivity settings are available: 300, 600, 1200, 2400, and 4800 gammas for full 10 inch deflection on the Gulf chart. Corresponding step values are respectively 250, 500, 1000, 2000 and 4000 gammas. The usable short term sensitivity is approximately 5 gammas and the total dynamic ranges are 250,000 gammas for the 4800, 2400, and 1200 gamma settings, 149,800 gammas for the 600 gamma setting and 74,900 gammas on the 300 gamma setting. Generally a sensitivity of 600 or 1200 gammas is used for this type of survey.

A Honeywell radar-altimeter provides a continuous terrain clearance profile on the six channel rectilinear recorder. Because EM response decays rapidly with increasing altitude, this terrain clearance information is important in the analysis of the EM data.

A vertical accelerometer mounted in the aircraft provides a record of the air turbulence and of any drastic manoeuvres of the aircraft. The accelerometer trace, recorded on the six channel rectilinear recorder, is often helpful in recognizing spurious signals on the EM traces caused by air turbulence or drastic manoeuvres.

A vertically mounted Aeropath AS-5 continuous strip 35 mm. camera, using a 14.5 mm. focal length lens, records the entire flight path of the aircraft.

Synchronization of the film strip with the two recorders employed is accomplished by means of an automatic fiducial numbering system, which prints simultaneous time markers on all records at regular time intervals, usually 10 seconds.

A 60 cycle detector indicates the presence of power lines which usually provide spurious anomalies on the EM records.

B. DESCRIPTION OF RECORDS

Rectilinear Magnetic Record

With the chart oriented so that fiducial numbers increase from right to left, upward deflections on the chart indicate increases in the total magnetic field of the earth. On the 1200 scale the smallest division on the chart is approximately equivalent to 10 gammas. When the record "steps" a change of approximately 1000 gammas is indicated.

Brush Six Channel Record

With the record oriented so that fiducial numbers increase from right to left, the tracings from bottom to top of the chart are:

Fiducial marks.

Channel 1) Magnetometer, positive upward, on the 1200 gamma setting 1 minor division is approximately equivalent to 25 gammas and one step approximately 1,000 gammas.

Channel 2) EM In-phase, positive upward. Two minor divisions represents approximately 25 parts per million referred to the primary field at the receiving coil. A calibration signal of 550 parts per million is displayed on the trace to provide an accurate measure of the sensitivity.

Channel 3) EM Quadrature, positive upward. Two minor divisions represents approximately 25 parts per million referred to the primary field at the receiving coil. A calibration signal of 550 parts per million is displayed on the trace to provide an accurate measure of the sensitivity.

Channel 4) Radar altimeter, altitude increases upward, 150' centre line and 300' top line of channel.

Channel 5) Vertical accelerometer

Channel 6) 60 cycle detector positive upwards, provides a record of power line 60 c.p.s. noise. There is no calibration but the signal is stronger for the larger power lines.

C. SURVEY AND MAP COMPILATION PROCEDURES

Uncontrolled airphoto mosaics usually serve as base maps for flying the survey and for compilation of geophysical data. The most common scale is 1/4 mile per inch.

The flight lines are oriented perpendicular to the assumed longest dimension of massive sulphide occurrences anticipated in the survey area. Occasionally two or more line directions have to be used to accommodate changes of geological strike within the area. Line spacings normally range between 1/8 and 1/4 mile.

The navigator is provided with "flight strips" of the area to be surveyed. These flight strips are a copy of the airphoto mosaics, with intended flight lines inked and numbered. Navigation along the parallel flight lines is accomplished by visual means based on physical detail observed on the photos. The aircraft is flown at a terrain clearance of 150 feet or, in rough terrain, at the lowest safe altitude.

Flight path is recovered in the field by comparison of the 35 mm. strip film with airphoto mosaics. Identifiable points are marked on the mosaics and designated by numbers determined from the fiducial numbering system on the film. These recovered flight lines provide a positional basis for plotting the geophysical data. The EM anomalies are listed and graded in the field and are often plotted on the field mosaics to permit immediate acquisition of ground.

In our Ottawa office screened positives of the mosaics are prepared, upon which are drafted the recovered fiducial points, the interpolated flight line positions and significant geophysical data. The geophysical data are subjected to a careful analysis by a geophysicist who prepares an interpretation report including recommendations for further work.

D. DATA PRESENTATION

The data presentation procedure employed for the Canso geophysical system is a combination of an anomaly listing and a plan map plot of graded EM anomalies. The anomaly listing provides the significant details concerning each anomaly and the map gives a "bird's eye view" of the conductors detected.

For purposes of listing and to facilitate reference in the report each EM anomaly is assigned a "name", which is made up of the number of the line upon which the anomaly occurs plus a letter. For example, on line 257 anomalies would be named 257A, 257B, 257C, etc., from south to north or from west to east. The letter which appears beside each EM anomaly on the map is therefore part of its name. These names also appear on the Brush records and in the anomaly list.

The anomaly list contains: fiducial numbers at the edges of the EM anomaly, in-phase and quadrature amplitudes in parts per million, altitude at which the anomaly was detected, positional relationship of the EM anomaly to magnetic anomalies (if any), a rating, and comments concerning any other pertinent characteristics of the anomaly.

The nomenclature used in the "magnetics" column of the anomaly list requires some explanation. The main terms used are side, flank, edge and direct. These refer to the position of the EM peak relative to the axis of the magnetic feature. "Direct" depicts coincident peaks and similar widths; "edge" is slightly offset; "flank" is somewhere along the flank of the magnetic anomaly; "side" is down near the base. "N Flank 800g" means that the EM anomaly occurs along the northern flank of a magnetic feature of 800 gammas total amplitude. When one peak of a multiple EM anomaly coincides with a magnetic high the specific peak may be designated. For example, if the southern peak of a double EM anomaly coincided with a 250 gamma magnetic anomaly the nomenclature would be "Dir. S. 250g".

The rating assigned to each EM anomaly in the listing determines the symbol which represents the anomaly on the map. Six categories of anomalies are defined: 1A, 1B, 2A, 2B, 3, and X. The numbers "1", "2" and "3" are a measure of in-phase amplitude corrected for altitude variation: "1" is for very large anomalies, "2" for intermediate, and "3" for relatively weak response. The letters "A" and "B" merely refer to the magnetics: "A" indicates a directly coincident magnetic anomaly, and "B" indicates the lack thereof. The "X" rating is reserved for questionable anomalies. The legend on the map shows the symbol used for each of these ratings. In general, the more the rectangle is filled in the stronger the anomaly.

In case of directly coincident magnetic anomalies, the amplitude of the magnetic feature is shown on the EM map. It is stencilled beneath the symbol which portrays the EM anomaly.

During the final interpretation stage, EM anomalies are correlated from line to line wherever possible and the conductive zones are outlined. All definite conductors are numbered on the map and discussed in the report.

File 2.1909

Ontario

42A15NW0010 2.1909 HANNA

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RECEIVED
SEP 10 1975
PROJECTS UNIT

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) Airborne Electromagnetic and Magnetic Survey

Township or Area Hanna-Reaume Area

Claim Holder(s) Brascan Resources Limited
Room 1414 - 390 Bay Street, Toronto

Survey Company Kenting Earth Sciences Ltd.

* Author of Report Robert W. Stemp, P.Eng.

Address of Author Ottawa, Ontario.

Covering Dates of Survey February 1st to 5th, 1975.
(linecutting to office)

Total Miles of Line Cut

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	
Geochemical	

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

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

DATE: Sept. 9/75 SIGNATURE: [signature]
Author of Report or Agent

Res. Geol. ____ * Qualifications 63.1989

Previous Surveys

File No.	Type	Date	Claim Holder
63.239	Ground Geophysical Survey		
63.1118	"		"
63.2747	"		"

LD

OFFICE USE ONLY

MINING CLAIMS TRAVERSED
List numerically

(prefix) (number)

P-428620, P-428621
P-428622, P-428623,
P-428624, P-428625,
P-428626, P-428627,
P-428628, P-428629,
P-428630, P-428631,
P-428632, P-428633,
P-428634, P-428635,
P-428636, P-428637,
P-428638, P-428639,
P-428640, P-428641,
P-428642, P-428643,
P-428644, P-428645,
P-428646, P-428647,
P-428648, P-428649,
P-428650, P-428651,
P-428652, P-442501,
P-442502, P-442503,
P-442504, P-442505,
P-442506, P-442507,
P-442508, P-442509,
P-442510, P-442511, P-442518
P-442512, P-442513, P-442519
P-442514, P-442515, P-444499
P-442516, P-442517, P-444500
Claims staked subsequent to airborne survey.

If space insufficient, attach list

TOTAL CLAIMS (54)

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations ______ Number of Readings ______

Station interval ______ Line spacing ______

Profile scale ______

Contour interval ______

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 ______

SELF POTENTIAL

Instrument ______ Range ______

Survey Method ______

Corrections made ______

RADIOMETRIC

Instrument ______

Values measured ______

Energy windows (levels) ______

Height of instrument ______ Background Count ______

Size of detector ______

Overburden ______

(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) Electromagnetic Magnetic

Instrument(s) Mark III low frequency in-phase/out-of-phase Mark III Fluxgate saturable core

(specify for each type of survey)

Accuracy 5 gammas

(specify for each type of survey)

Aircraft used Canso (CF-JJG)

Sensor altitude 150 feet

Navigation and flight path recovery method Navigation by visual means aided by air-photo mosaics. Flight path recovery by comparison of 35 mm. strip film with air photo mosaics.

Aircraft altitude 150 feet Line Spacing 1/8 mile

Miles flown over total area 348 Over claims only 25½

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken __________

Total Number of Samples __________

Type of Sample __________
(Nature of Material)

Average Sample Weight __________

Method of Collection __________

Soil Horizon Sampled __________

Horizon Development __________

Sample Depth __________

Terrain __________

Drainage Development __________

Estimated Range of Overburden Thickness __________

SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis __________

General __________

ANALYTICAL METHODS

Values expressed in: per cent ☐ p. p. m. ☐ p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others __________

Field Analysis (__________ tests)

Extraction Method __________

Analytical Method __________

Reagents Used __________

Field Laboratory Analysis

No. (__________ tests)

Extraction Method __________

Analytical Method __________

Reagents Used __________

Commercial Laboratory (__________ tests)

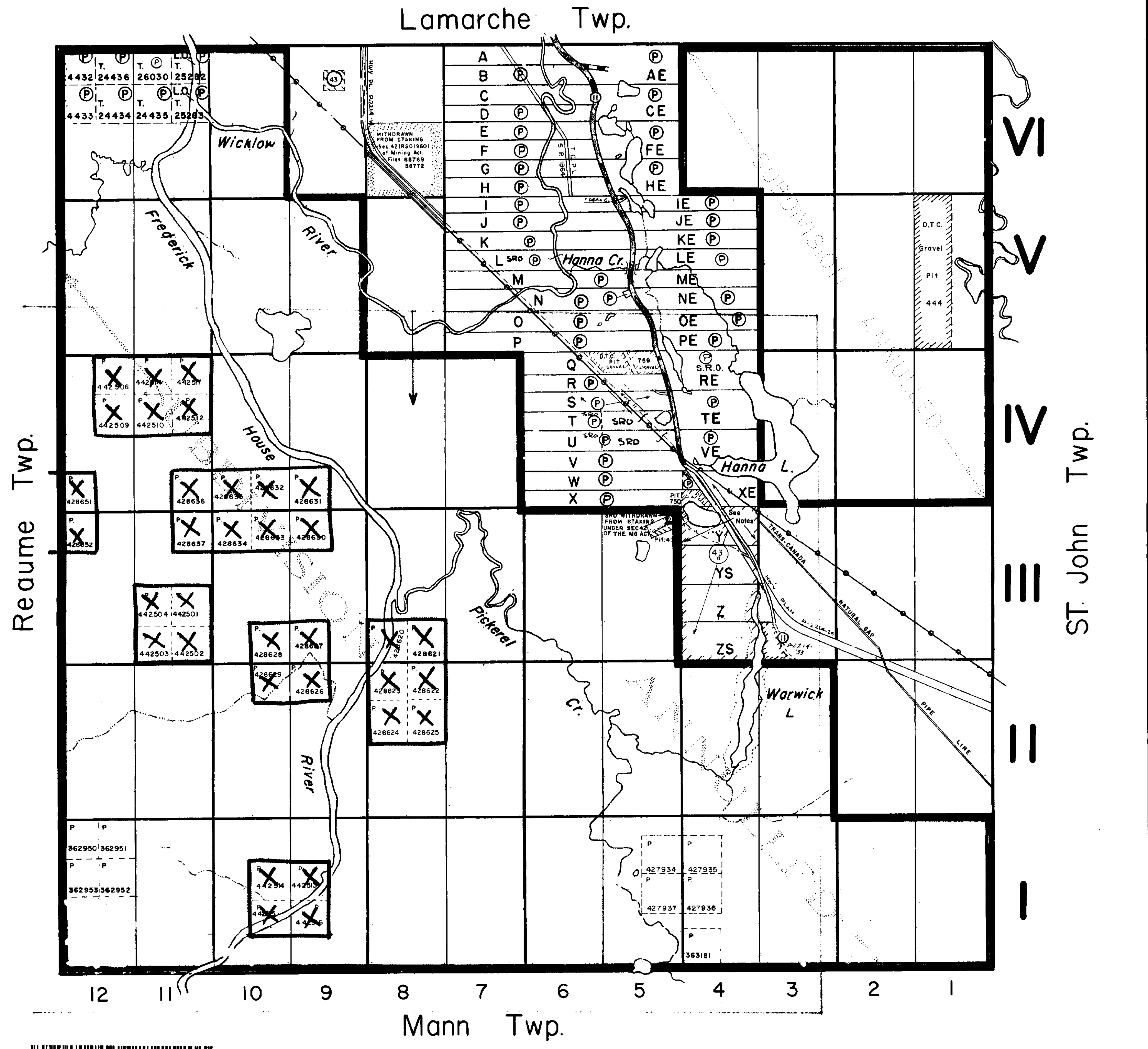
Name of Laboratory __________

Extraction Method __________

Analytical Method __________

Reagents Used __________

General __________



THE TOWNSHIP OF 2.1909

HANNA

DISTRICT OF COCHRANE

PORCUPINE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
ROADS	
IMPROVED ROADS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
KING'S HIGHWAY	

NOTES

400' Surface rights reservation around all lakes & rivers.

REG. PLAN NO.-M. 57 COVERS LOTS "A" TO Z-S. IN CON. 3 TO CON. 6.

Surface Rights Only reserved to Dept of Lands & Forests shown thus : File 88767

See L. & F. File 96605—122598 Re Gravel On Loc. XE & Loc. Y.

Areas withdrawn from staking under Section 43 of the Mining Act (R.S.O. 1970).

Order No.	File	Date	Disposition
W.54/73	(43) 88773	27/11/73	S.R.O.
W.32/74	(43) 96605	12/6/74	S.R.O.

MINING LANDS - DATE OF ISSUE NOV 14 1975 MINISTRY OF NATURAL RESOURCES

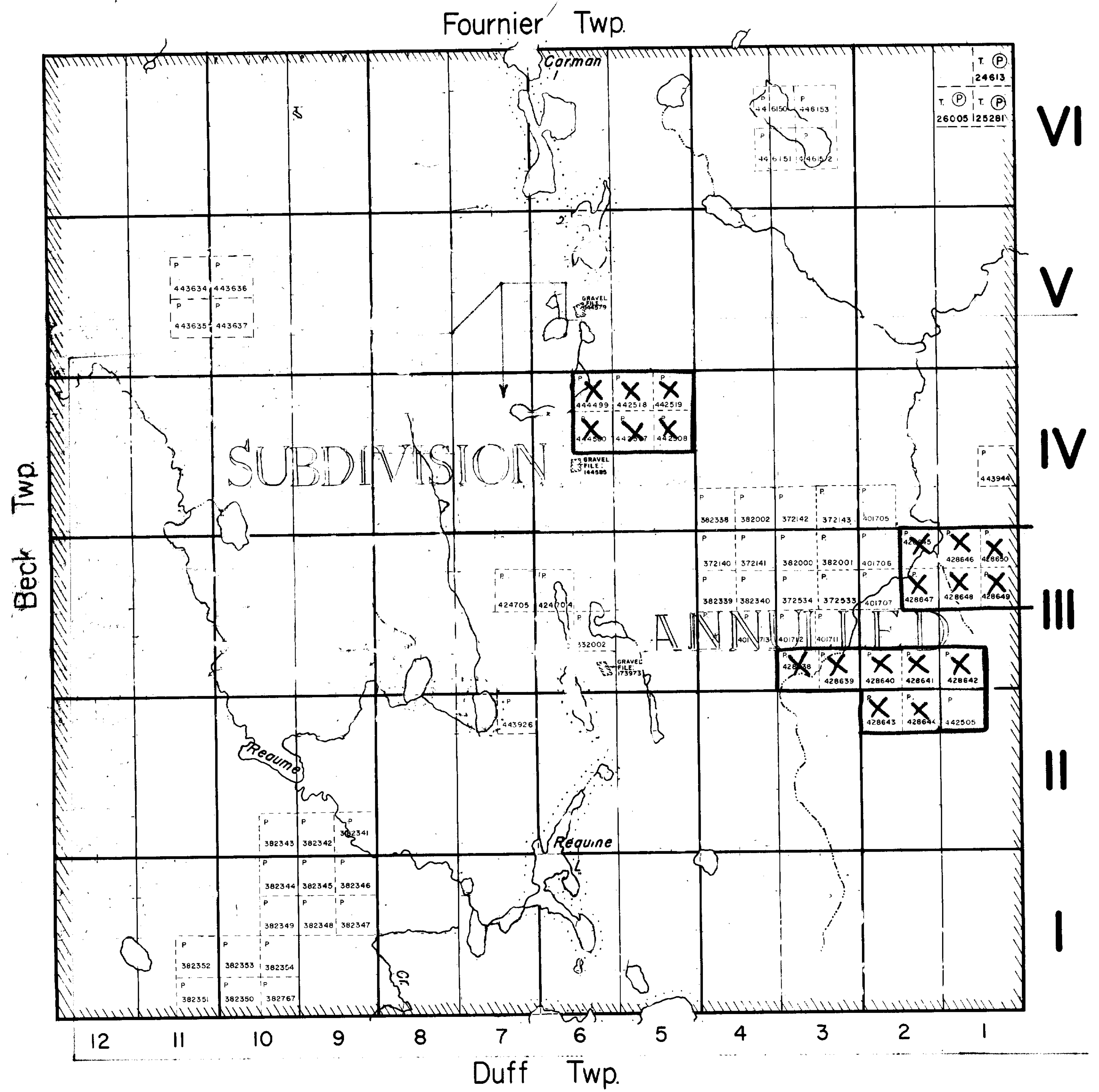
PLAN NO.— M 490

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

42A15NW0010 2.1909 HANNA

200

J.G.



THE TOWNSHIP OF REAUME

2.1909

DISTRICT OF COCHRANE

PORCUPINE MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	Ⓟ
CROWN LAND SALE	C.S.
LEASES	Ⓛ
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
ROADS	
IMPROVED ROADS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	

NOTES

400' Surface Rights Reservation around all Lakes and Rivers.

ENTIRE SUBDIVISION ANNULLED BY ORDER OF THE SURVEYOR GENERAL FILE 112122.

MINING LANDS - DATE OF ISSUE NOV 14 1975 MINISTRY OF NATURAL RESOURCES

PLAN NO. — M-576

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

42A15NW0010 2.1909 HANNA

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G.E.M.

REAUME - HANNA TWP AREA

LIMITED

MEAN TERRAIN CLEARANCE

TRAVERSE INTERVAL

HORIZONTAL CONTROL

REAUME – HANNA TWP. AREA

BRASCAN RESOURCES LIMITED

REAUME-HANNA TWP. AREA

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REAUME HANNA TWP AREA