INTRODUCTION

The James Bay Lowlands south of Moosonee is an area of Paleozoic cover typified by poor drainage and a largely featureless swampy terrain. Recent aeromagnetic coverage however suggests that the thickness of cover is not unduly great, probably ranging between 100' to 500', and that the basement rocks contain basic to ultrabasic intrusions forming a belt of major regional dimensions. Interest in the area has been stimulated by the discovery of carbonatite minerals, with attendant possibilities in base metal sulphides, particularly in copper and nickel.

The thickness of the Paleozoic cover evident to this section is not inhibitive to deeply penetrating EM surveys. In view of this circumstance, Consolidated Manitoba Mines in their current exploration of the region, applied the INPUT® airborne EM system in an effort to narrow the search area down to particular sections of promise. The results of this programme form the subject of this report.

Actual flying operations were carried out by Selco Exploration Company Limited in the one day, 7th April 1967. The winter strip at Moosonee was utilized for this purpose. The completed survey totalled 519.5 linear miles of productive surveying at a line spacing of ¼ mile. All flight path recovery, data reduction, compilation and interpretation has been undertaken by Barringer Research Limited.

GENERAL REMARKS

The Mark V Barringer INPUT system features six channels of recorded EM information, each channel representing successive samplings down the decay curve of the secondary field response following the cessation of the primary excitation pulse. In a highly resistive ground environment barren of conducting materials, the secondary field collapses almost instantaneously with the termination of the primary pulse, and no signals appear in the sampling channels; however in the presence of any ground conduction sub-surface, the induced secondary field therefrom decays more slowly and at a perceptible rates. For any given source, signals appear in a number of consecutive channels from channel 1 up to channel 6 according to the time constant of the decay.

Variations in inherent conductivities of ground materials are reflected in corresponding variations in the time constant. Thus poorly conducting sources possess short time constants and their response is confined to the first one or two channels in the INPUT record; highly conducting sources on the other hand show long time constants and are apt to appear in all six channels. However they need not, as the strength of response, as given by anomaly amplitude, is dependent upon a number of factors such as source dimensions, attitude, depth of burial and environmental conditions. It is also very much dependent on the altitude of the aircraft. To monitor the latter, radio altimeter measurements are continuously recorded and appear as a separate trace on the record.

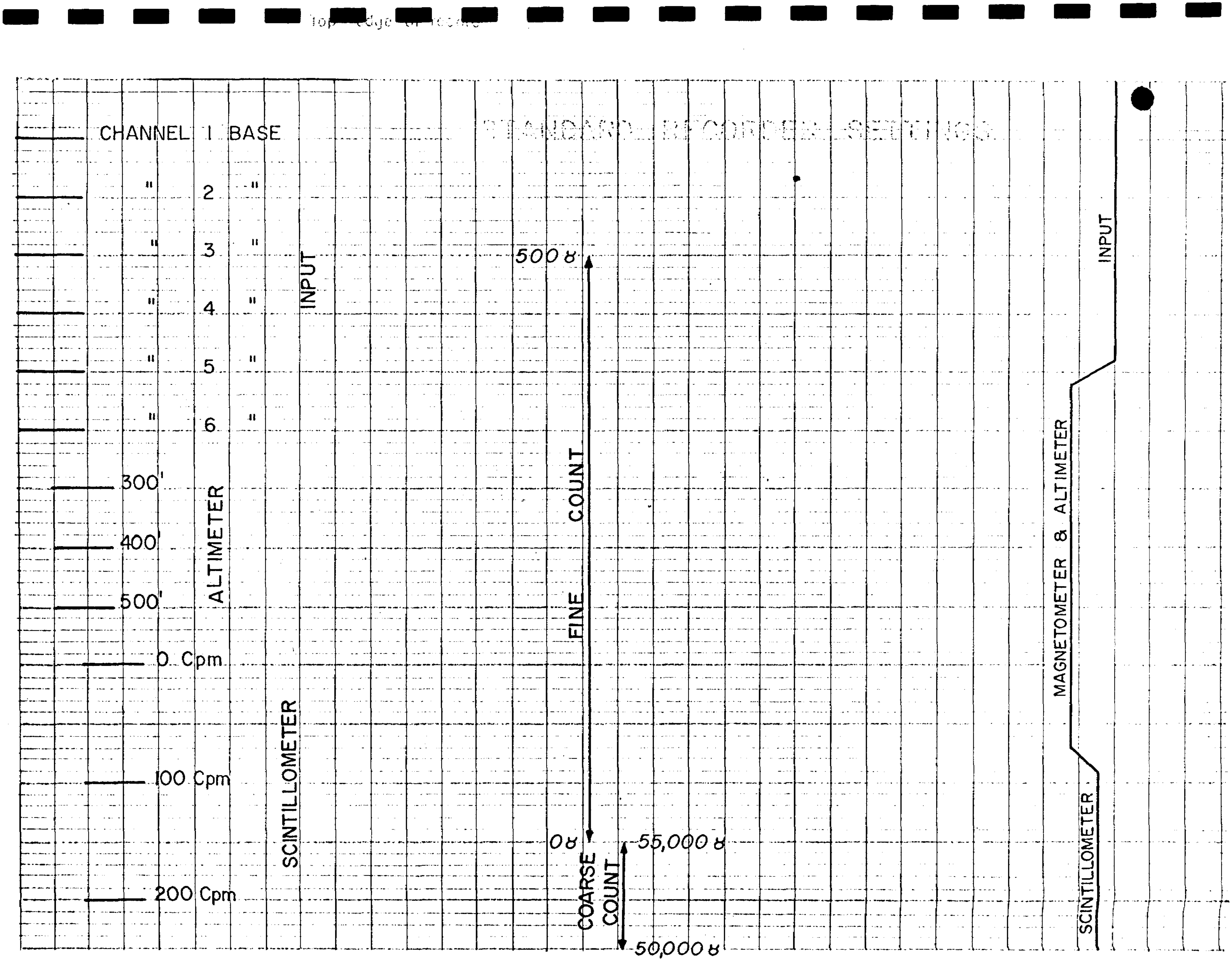
The INPUT data are supported by a concurrent recording of the earth's magnetic field. A Barringer AM-101A nuclear precession magnetometer is time-shared with the INPUT system to provide total intensity measurements every 1.3 seconds. These are recorded to a 5 γ accuracy on the two ranges of 500 γ full scale and 5,000 γ full scale. On the record, this reduces to 1"=100 γ and 1"=5,000 γ respectively. Also concurrently recorded is total count radioactivity as measured by scintollometer. At the operational height and speed of the aircraft however, these latter readings are unlikely to have any significance to near-point sources of radioactive anomaly, but in describing regional changes in gross background level, they could provide valuable environmental information.

All these measuring systems are installed in a PBY Super Canso flown at approximately 120 knots at a mean altitude of 380' AGL. Navigation is undertaken visually from photo-mosaic, and is monitored by an in-flight tracking camera synchronized to the record by an intervalometer-controlled fiducial system. Flight path recovery is made to the mosaic from the flight strip film, and geophysical data are plotted thereon according to their fiducial position. Final presentation is made on base maps prepared from a greyflex of the original mosaic. The record itself comprises a light-sensitive paper derived from a multi-channel recorder. For practical purposes, it is either permanized by chemical fixer or by Xerox copy.

The present record features the six channels of INPUT information consecutively placed from the top of the record channel 1 through to channel 6, each to a separate datum. The radioaltimeter and scintollometer traces occupy the middle and lower half of the record respectively. The two magnetometer recordings are recognizable by their stepped appearance. The scales of recording and the inherent time lags between these various information channels relative to a single instant are given in the attached template of standard recorder settings.

Additional to the record is a power-line monitor tuned to a 50 cycle frequency. This appears at the very top of the record, but is usually only noticeable in the presence of power-line noise, notably lacking in the present area.

The results of the survey are discussed in greater detail in the section that follows. However, in this discussion the emphasis is heavily weighted to the INPUT data, the magnetic results largely being assessed only as they affect the evaluation of INPUT source and setting. No attempt has been made to process the scintollometer data in detail. They are generally without feature, which is only to be expected in view of the widespread prevalence of cover and the limitations provided by the aircraft operation itself, as noted previously; thus it is doubtful in the circumstances that anything useful can be extracted from them. In the following section, it should be noted, no particular significance should be given the order in which events and situations are discussed. There appear a variety of possibilities, and any one could have economic potential.


Top edge of record
STANDARD RECORDER SETTINGS
CHANNEL 1 BASE
" 2 "
" 3 "
" 4 "
" 5 "
" 6 "
INPUT
300'
400'
500'
ALTIMETER
0 Cpm
100 Cpm
200 Cpm
SCINTILLOMETER
500 γ
FINE COUNT
0 γ
COARSE COUNT
55,000 γ
50,000 γ
INPUT
MAGNETOMETER & ALTIMETER
SCINTILLOMETER

DISCUSSION OF RESULTS

The area flown is characterized by a widespread and prevailing overburden conduction. Not generally of a high order of conductivity, the overburden response nevertheless shows a consistent tendency to increase to the west, culminating there in a relatively strong and persistent zone that can be traced completely across the area. In providing this trend from east to west, the overburden response, rather than changing gradually, steps through various recognizable levels, thereby allowing the tracing of appropriate "contacts" between contrasting conductivity units. These loci are shown on the INPUT anomaly plan presentation.

The fact that overburden conduction exists at all means that the INPUT record is sensitive to altitude change. That is, responses are introduced into the record solely as a result of the nearing or distancing of the airborne system to a semi-infinite surface sheet. The effect sometimes is to provide simulated anomalies that otherwise could be mistaken for bedrock conductors, as will be noted later, or to provide irregularities in the contact loci. For this latter reason, particularly the conductivity lines shown should not be regarded as contours, but as form lines, and these should be viewed as depicting only the general disposition of the background conductivity changes across the area.

The significance of these changes is dual. In this area, the overburden is composed not merely of fluvio-glacial material in surficial deposits but also of Paleozoic sediments probably varying in thickness up to 400', possibly 600'. The basement rocks, also commonly referred to as bedrock in the ensuing discussion, are crystalline Archean and are presumed largely intrusive. The changes in background conductivity are therefore likely to be due to two things: changes in thickness of the total cover to basement, and changes within the sediments themselves. Where they are abrupt, these changes are more prone to be of the first type, and thereby probably to have a reflection in the topographic relief of the basement surface. The significance of this relationship is that any knowledge of, say, escarpments in the Archean surface could have important implications with respect to buried structure.

Changes of the second type are more difficult, both to recognize and to interpret. Gradual changes and broad closures could be indicative of the likely interbedding, facies changes, and varying salinity appropriate to a sedimentary sequence. Super-imposed on these are the predictable irregularities in the unconsolidated material of the Pleistocene and more recent cover near-surface.

The magnetic data are almost wholly related to basement. They give evidence of the complexity of the intrusive rocks and the probability of ultrabasic bodies included therein. They also allow the postulation of structure, and in this regard form a valuable adjunct to the background conductivity evidence. The major magnetic activity recorded in the survey sweeps across the area between two well-defined and diverging boundaries. The western edge coincides with the strong conductivity zone developed along that side of the coverage, and a controlling fault appears probable.

No strong anomaly systems in bedrock have been detected in the survey. This is not so much a question of cover which obviously causes a weakening of observed amplitudes, but more of strike. No system has been developed with a fair and consistent resolution over any appreciable and manifestly continuous strike length. In many ways, this is neither an unfortunate nor unexpected circumstance, as any mineralization in the basement environment is more likely appropriate to a relatively short and modestly conducting system than to a strong and lengthy one. However, in the prevailing conditions of cover, the recognition of such likely systems becomes somewhat ambiguous due to the conductivity effects of the overlying materials.

Taking these factors into consideration, there nevertheless emerge several anomaly events deserving of attention. One embraces the group 15E, 16E, 18C which forms a continuous axis through the fiducial point 621.1 on line 17. Here there is a modest channel 2 peaking superimposed on local overburden variations. The key to this system is its consistent correlation with the spine of a large magnetic feature, as it narrows and noses out to the SW. Indeed there is evidence that the conduction is in coincidence with a magnetic peak that is locally superimposed on the broader based anomaly. At the system, the depth of burial may be estimated at approximately 200'. The INPUT anomalies themselves are subdued in their resolutions and show little evidence of extending beyond channel 2. The central anomaly 16E, however, gives hints of a decay persisting to channel 4, and significantly this reponse is entirely free of altitude effects. The system as a whole therefore provides an attractive target worthy of follow-up.

In the same vicinity about one mile to the north-west lies the two line group 19B, 20E. This system occurs in a more resistive environment than the previous group to the advantage of its resolution. However it remains quite modest in its strength, and in fact some altitude contribution can be presumed for the anomaly 19B. There is no distinctive magnetic expression as such peaking in correlation, but there is evidence that the system is associated with a local shoulder on the broad westerly flank of the same large magnetic feature in the area. Even in its subtlety this shoulder, amounting to about 40 γ relief, appears confined to the conduction, giving to the system a distinction that is deserving of further investigation.

Of some substance is the anomaly 22M. This is a comparatively strong event, independent of altitude, and in direct correlation with a 440 γ magnetic peak. The anomaly occurs in a small zone of conductivity that is patently due to overburden and which extends across several lines, but is differentiated from this environment by the strength of its peaking, and associated decay. Unlike the zone elsewhere, the response at 22M extends into channel 5. As a system, this anomaly could have a weak extension south-east to line 20, dying out with the magnetics. Cover is expected to be deeper in this area, and could be as much as 400'.

More dubious in their validity are the two anomalies 28A, 27D. Both are quite modest expressions, but neither are free of altitude contributions. However the resolution of 28A appears somewhat higher order than can be explained by altitude change alone, and both anomalies give evidence of extending to channel 3, again somewhat more than might be expected otherwise. The pair combine to form a short group that sits on a magnetic shoulder to an adjacent larger feature, and this association may well be distinctive to the conduction. Such a possibility clearly could bear investigation. It is interesting to note that this system, and that which preceded it, besides sharing a common strike bearing, could be straddling a regional cross-structure. The evidence for the latter stems both from the INPUT data and the magnetics, the first from the displacement evident to the conductivity form lines in the vicinity and along an axis bearing ENE to the limits of the coverage; the second from the termination together with local distortion of several magnetic features along the same axis. If valid, the existence of this through-going break could have important implications to mineral localization in the area.

Another system that would appear in close proximity to this structural axis is the short group 29A and 30J. These anomalies have been recorded with little ambiguity from altitude effects in the more resistive side of the survey area. It so happens that they also fall outside the central region of magnetic activity, although, as can be seen from the magnetic contours, not too far removed from the likely contact. Whilst the system itself is non-magnetic, this setting is not without interest particularly as the anomaly 30J exhibits a fair resolution to channel 4. The cause to this system in a likely contact/structural environment therefore merits follow-up.

Two other possibilities that exist along the axial strike of the postulated break are the two widely separated events 26A and 25D. The first is isolated and suffers by being associated with a fairly sharp change in altutude, but the response amplitude is fair decaying to channel 3, and appears in excess of that to be expected in what is a reasonably resistive environment. Alternatively however, the anomaly could be due to a narrowed local embayment in extension of the broad conductivity zone lying to the south. Nevertheless mineralization has been reported in this vicinity, and even though non-magnetic the anomaly raises a local possibility that can not be ignored. It warrants investigation. The second of the two anomalies, viz. 25D, also is non-magnetic, but it possesses a quite fair resolution to channel 3 in moderately good strength. It has a counterpart on the adjacent line in anomaly 26C. Neither are entirely free of altitude effects, but these are minor and present no real ambiguity. The system so defined takes on the regional strike and appears valid to bedrock. Because of its location, it merits inclusion in the follow-up investigation.

There are two isolated anomalies along the Partridge River that deserve comment. One is 12E, a modest rounded resolution to channel 2 recorded in a comparatively resistive section of the environment. Its distinction lies in the fact that it could occur on another cross-structure, as indicated by the behaviour of the form line in its vicinity, also the magnetics, albeit both far less clearly than previously, and that it could be weakly magnetic in the amount of 20 γ. The other is 38M, an anomaly that exhibits a good resolution to channel 4 in modest strength. It is, however, non-magnetic, and is not free of some altitude contribution. The quality of the resolution nevertheless remains a feature, and there could be merit in determining its cause.

Nearby to the latter is the well defined system 35E, 36E, and 37E. The whole system is intimately associated with a conductivity contact in the background variations, without at any time appearing completely due to an edge effect as such a resistivity contrast might provide. The individual anomalies, particularly 36E and 37E, show a preciseness in their resolution that suggests a localized source independent of the adjacent contrast; and this to some extent is confirmed by the magnetics, which in each case provides minor (20 γ) but local activity in correlation. The resolution of 37E actually is one of the cleanest recorded in the survey, but as might be expected, it is enhanced by a small but fairly sharp altitude change. The strike of the system is curved as it swings around the lip of an aeromagnetic low lying to the north. There is further the fair possibility that at its south end it terminates against a structural axis bearing WNW across the area. The suggestion of a drag strike the combination provides indicates a fault-shear movement with the north side displaced east. In any event, the system as a probable bedrock merits examination for itself.

At the east edge of the coverage occurs the system 17H, 18A, 19A. This is not a particularly well resolved group of anomalies, each displaying a broad, possibly dual character. However, the eastern side of the implied zone shows improved quality with decays extending to channel 3, and the possibility of a magnetic correlation, albeit very minor at 20 γ. The system occurs in the resistive environment characteristic to the east side of the area, and is largely unaffected by altitude changes. On the regional aeromagnetic evidence, a totally differing basement geology is to be expected, probably granitic and reasonably uniform.

The occurrence of the system in this setting suggests another type of conducting source from those seen elsewhere, and if for no other reason than broadening the base of the exploration in the area, it could merit consideration.

Outside the various possibilities presented in all the foregoing anomaly situations, there remain to the area a number of anomaly expressions that could hold possible future interest. These for the moment do not emerge clearly as points for investigation, either because their inherent ambiguity to background effects is high or because they otherwise lack any mark of distinction. In this category are the anomalies 2B, 6B, 7M, 11N, 19D, 20C, 31D, 41C, 41H, 42E. As can be seen, most of these are isolated, and occur in a wide scatter across the area, and in varying magnetic environments. Any one would deserve checking, if other investigations in the vicinity or in an analogous environment enhanced their possibilities.

BARRINGER RESEARCH LIMITED

J. B. Boniwell
Chief Geophysicist

JBB:np

May 25/67

APPENDIX I

Anomalies given weight in the foregoing discussion (grouped into systems)

12E

15E, 16E, 18C

17A, 18A, 19A

19B, 20E

22M

25D, 26C

26A

27D, 28A

29A, 30J

35E, 36E, 37E

38M

[redacted] JOB N° [redacted] 140 [redacted] AREA [redacted] ES [redacted] LOW [redacted] S [redacted]

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PAGE 1

FLIGHT N°.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
44	1W	A	073.32	073.25 - 073.40		400			2		
43	2E	A	660.99	660.78 - 661.12		370			3		
		B	661.50	661.40 - 661.62		370	40		2		
		C	662.12	- - - - - -		370			2		
		D	662.48	- - - - - -		380			2		
		E	663.18	663.08 - 663.27	0.1	340			4		
		F	663.70	663.50 - 663.81		380			2		
		G	664.84	664.70 - 664.93		380	630		3		
		H	668.02	667.92 - 668.22		380	50		3		
		J	668.79	668.65 - 668.95		410			2		
		K	669.33	669.18 - 669.41		380			2		
		L	Zone	669.70 - 669.82		370			Zone		
43	3W	A	647.84	647.70 - 647.95		390			3		
		B	Zone	649.57 - 649.74		380			Zone		
		C	650.15	650.03 - 650.22		380			3		
		D	650.48	650.41 - 650.55		380			2		
		E	650.92	650.80 - 651.01		370			2		
		F	651.43	651.38 - 651.52		360			2		
		G	651.90	651.82 - 651.98		360			3		
		H	654.80	654.48 - 654.67	0.1	400			4		
		J	655.60	655.49 - 655.70		390			3		
		K	656.45	- - - - - -		370			2		
		L	657.30	657.22 - 657.38		370			2		
44	4E	A	061.55	060.97 - 061.17		400			2		
		B	063.68	063.60 - 063.75		370	340		3		
		C	063.98	063.92 - 064.10		390			2		

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FLIGHT N°.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
44	5E	A	037.67	- - - - - - -		380			2		
		B	038.02	- - - - - - -		400			2		
		C	043.32	043.25 - 043.35		380			2		
44	6W	A	049.68	049.60 - 049.80		380			2		
		B	050.02	- - - - - - - -		400	40		2		
		C	053.40	- - - - - - - -		370	190		2		
		D	054.77	- - - - - - -		400			2		
		E	058.25	- - - - - - -		390			2		
43	7W	A	670.45	670.35 - 670.52	0.1	440			4		
		B	670.84	- - - - - - -		410			2		
		C	671.28	671.15 - 671.39		380			2		
		D	672.23	672.11 - 672.30		390			2		
		E	674.23	674.15 - 674.33	0.1	380			4		
		F	676.77	674.68 - 674.88		400			3		
		G	675.47	675.39 ↓		400	200		2		
		H	675.69	675.62 - 675.76		380			2		
		J	676.68	676.58 - 676.77	0.2	360	40		5		
		K	677.05	676.95 - 677.16	0.1	410			4		
		L	677.46	- - - - - - -		400			2		
		M	678.15	678.07 - 678.26		400			3		
		N	678.57	678.46 - 678.70		380			2		
		P	679.40	679.32 - 679.51		360			2		
		R	680.48	680.33 - 680.59		360			3		
43	8E	A	637.91	637.80 - 638.01	0.1	370			4		
		B	638.42	- - - - - -		340			3		
		C	641.50	641.38 - 641.57		410			3		
		D	645.07	644.94 - 645.18		390			3		

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JOB N°. 140[redacted] AREA J[redacted]S BA[redacted] LOWI[redacted]S

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FLIGHT N°.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
44	9W	A	033.95	033.86 - 034.00		410			2		
		B	035.02	— — — — — —		380			2		
		C	035.62	035.55 - 035.71		420	400		2		
44	10E	A	014.50	— — — — —		380			2		
43	11E	A	682.72	— — — — —		380			2		
		B	683.21	683.13 - 683.30		370			2		
		C	683.84	683.74 - 683.92		390			2		
		D	684.20	684.11 - 684.32		380			2		
		E	684.92	684.84 - 685.05	0.1	390			4		
		F	685.29	685.22 - 685.40	0.1	310			4		
		G	685.70	685.62 - 685.80	0.1	370			4		
		H	686.07	686.02 - 686.12		380			2		
		J	687.37	687.30 - 687.45		410			2		
		K	688.35	688.19 - 688.42		380			2		
		L	689.40	689.32 - 689.50		380			3		
		M	689.89	689.70 - 690.01		400			2		
		N	690.53	690.45 - 690.62	0.1	390			4		
43	12W	A	626.07	626.00 - 626.17		360			3		
		B	628.89	— — — — —		360	80		2		
		C	629.40	— — — — —		360			2		
		D	630.39	— — — — —		380			2		
		E	630.87	630.77 - 630.95		430			2		
44	13W	A	002.53	— — — — —		390			2		
		B	008.53	— — — — — —		420			2		
		C	012.30	012.22 - 012.40		380			2		
		D	012.95	— — — — —		420			2		

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JOB Nº. 1[redacted]6 AREA [redacted]ES B[redacted]LOW[redacted]S

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FLIGHT Nº.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
43	14W	A	525.70	— — — — —		490			2		
		B	526.07	525.98 - 526.14		370			2		
		C	526.48	— — — — — —		380			2		
		D	527.21	527.09 - 527.29		420			2		
		E	530.05	— — — — — —		460	30		2		
		F	530.42	530.34 - 530.49		450			2		
		G	531.86	— — — — — —		500			2		
		H	534.41	534.33 - 534.47		470			2		
44	15E	A	989.73	989.67 - 989.82		370			2		
		B	990.25	990.06 - 990.43		360			3		
		C	990.89	990.78 - 990.02		380			3		
		D	993.11	— — — — — —		390			2		
		E	996.46	— — — — — —		380	600		2		
		F	Zone	998.97 0 999.13		380			Zone		
43	16W	A	693.30	— — — — —		450			2		
		B	Zone	693.91 - 694.06		370	70		Zone		
		C	694.72	694.58 - 698.87		360			2		
		D	695.26	695.18 - 695.38		370			2		
		E	696.13	696.03 - 696.20		410			2		
		F	703.20	702.99 - 703.42		400			3		
43	17E	A	613.96	— — — — —		440			2		
		B	614.25	614.16 - 614.31	0.2	390			6		
		C	614.44	614.37 - 614.54	0.1	380			4		
		D	616.80	— — — — —		420	—		2		
		E	617.27	— — — — —		390			2		
		F	621.63	621.53 - 621.71		370			2		
		G	622.37	622.28 - 622.44		400			2		

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FLIGHT No.	ANOMALY	FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
43	17E G	622.37	622.28 - 622.44		400			2		
43	18W A	602.62	602.55 - 602.87		350			2		
	B	604.07	— — — — —		304			2		
	C	605.68	— — — — —		380			2		
	D	608.34	608.25 - 608.39		380			2		
	E	609.55	— — — — —		420			2		
	F	612.07	612.00 - 612.16	0.1	360			4		
	G	612.96	612.83 - 613.02		420			2		
44	19W A	918.13	918.06 - 918.25		420			3		
	B	922.08	921.98 - 922.19		400			2		
	C	924.04	923.98 - 924.12		350			3		
	D	927.72	— — — — —		390	40		2		
	E	929.21	929.02 - 929.27		420			3		
	F	929.56	929.51 - 929.66		410			2		
43	20E A	705.03	704.95 - 705.09		390			3		
	B	705.36	— — — — —		390			3		
	C	706.20	706.11 - 706.29		440			2		
	D	707.92	707.81 - 708.00		440			2		
	E	710.22	710.10 - 710.32		430			2		
	F	712.09	— — — — —		370			3		
	G	713.61	713.55 - 713.69		380			2		
44	21W A	985.84	985.75 - 985.98		380			2		
43	22E A	588.38	588.30 - 588.46		420			2		
	B	588.77	— — — — —		380			3		
	C	589.10	589.00 - 589.17		380			3		
	D	589.70	589.63 - 589.76		380			3		
	E	590.08	589.97 - 590.19	0.2	380			5		

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FLIGHT Nº.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
43	22E	F	590.62	590.53 - 590.68		370			3		
		G	591.03	590.96 - 591.11	0.2	390			3		
		H	591.42	591.34 - 591.52		390			3		
		J	592.01	591.98 - 592.05	0.1	360			4		
		K	592.47	592.39 - 592.51		380			3		
		L	592.82	592.68 - 592.88		350			3		
		M	594.42	594.30 - 594.63		380	440		3		
44	23E	A	932.55	— — — —		370			2		
		B	933.55	— — — —		430			3		
		C	934.10	933.97 - 934.23		400			2		
		D	935.46	935.33 - 935.56		370			2		
		E	936.43	936.33 - 936.51		370	340		2		
		F	938.22	— — — —		380			2		
		G	940.40	— — — —		380			2		
		H	942.97	942.85 - 943.03		360			3		
44	24	A	905.99	905.88 - 906.08		380			2		
		B	907.07	906.98 - 907.20		390			2		
		C	907.59	907.51 - 907.68		370			2		
		D	908.57	— — — —		360			2		
		E	910.68	910.58 - 910.78		390			2		
		F	913.75	— — — —		380			2		
		G	914.27	914.13 - 914.34		410			2		
43	25W	A	715.36	715.22 - 715.50		340			2		
		B	715.88	715.82 - 716.00		330			2		
		C	721.09	— — — —		370	2		2		
		D	723.47	723.37 - 723.58		380			3		
		E	726.06			380			2		

BARRINGER RESEARCH LTD.

JOB No. 1[redacted]6 AREA [redacted]MES [redacted]Y LO[redacted]NDS

FLIGHT No.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
43	25W	F	726.35	726.19 - 726.46	0.2	400			4		
43	26W	A	578.88	578.71 - 578.98		290			3		
		B	581.87	581.79 - 581.94		380			2		
		C	583.83	583.72 - 583.95		380			2		
		D	584.67	584.55 - 584.72		380			2		
		E	585.02	584.93 - 585.09		360			3		
		F	585.41	585.35 - 585.49		360			3		
		G	586.12	586.02 - 586.27	0.1	360			5		
		H	586.81	586.71 - 586.91	0.3	380			4		
		J	587.12	587.04 - 587.16	0.1	350			4		
		K	587.50	587.41 - 587.59	0.1	360			4		
		L	587.98	587.78 - 588.10		350			3		
44	27E	A	960.00	959.91 - 960.10		420			3		
		B	961.02	960.95 - 961.14		360	150		2		
		C	961.97	961.87 - 962.10		390			2		
		D	965.22	965.11 - 965.29		370			2		
44	28W	A	898.51	898.37 - 898.63		350			3		
		B	899.75	899.62 - 899.86		370			2		
		C	900.18	900.10 - 900.30		350			3		
		D	901.62	901.57 - 901.66		380			2		
		E	902.19	902.13 - 90.230		380			2		
		F	902.63	902.54 - 902.75		370			3		
		G	903.38	— — — —		380	150		2		
		H	904.04	903.92 - 904.10		370			2		
44	29W	A	946.52	— — — — — —		400			2		
		B	947.09	— — — — —		390			2		
		C	956.34	956.23 - 956.46		370			3		

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JOB Nº. 140.06 AREA JAMES BAY LOWLANDS

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FLIGHT Nº.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
44	29W	D	958.51	958.34 - 958.65		370			2		
43	30E	A	563.68	563.58 - 563.79	0.2	370			5		
		B	563.95	563.91 - 564.01		370			2		
		C	564.71	564.56 - 564.81	0.1	360			4		
		D	565.16	565.09 - 565.29		410			3		
		E	565.53	565.42 - 565.62		410			3		
		F	565.95	565.81 - 566.04	0.1	360			4		
		G	566.48	566.30 - 566.59		380			2		
		H	567.93	- - - - - - -		410			2		
		J	574.02	573.92 - 574.11	0.1	380			4		
43	31W	A	817.46	817.33 - 817.55		410	200		2		
		B	817.79	817.71 - 817.85		390			2		
43	31W	C	818.02	817.97 - 818.10		340			3		
		D	820.47	820.35 - 820.57		400			2		
		E	826.58	826.50 - 826.65		370			2		
		F	827.37	827.30 - 827.46		380			2		
44	32E	A	877.36	- - - - - - - - - -		390			2		
		B	877.88	- - - - - - -		390			2		
		C	880.54	- - - - - - -		370			2		
		D	886.75	886.71 - 886.80		350			2		
		E	886.92	- - - - - - -		360			2		
43	33W	A	735.75	735.70 - 735.87		370			3		
		B	736.35	736.32 - 736.42		410			2		
		C	736.82	736.66 - 736.88		410			3		
		D	740.60	740.48 - 740.73		380			2		
		E	741.24	741.12 - 741.34		370			3		
		F	741.66	- - - - - - -		360			2		

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JOB N°. 140.9 AREA JAMES BAY LOWLANDS

FLIGHT N°.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
43	33W	G	742.52	— — — — — —		360			2		
		H	743.58	— — — — — —		390			2		
		J	744.43	— — — — — —		380			2		
		K	744.83	744.68 - 744.98		360			3		
		L	745.27	745.17 - 745.35		380			3		
		M	745.74	745.55 - 745.91		370			2		
		N	746.34	746.20 - 746.46		380			2		
		P	747.02	746.93 - 747.10	0.1	390			4		
44	34W	A	876.07	— — — — — —		390			2		
43	35E	A	802.23	802.15 - 802.32	0.1	460			4		
		B	802.60	802.50 - 802.69	0.1	420			5		
		C	804.33	804.22 - 804.42		410			2		
		D	808.05	807.97 - 808.12		420			2		
		E	810.02	809.96 - 810.10		450			2		
		F	813.14	— — — — — —		420			2		
		G	813.94	813.84 - 814.02		380			2		
43	36W	A	550.41	550.35 - 550.46		350			2		
		B	552.62	552.53 - 552.70		370			3		
		C	553.02	552.95 - 553.09		400			3		
		D	553.41	553.34 - 553.46		370			2		
		E	553.83	553.76 - 553.92	0.2	370			4		
		F	560.14	560.07 - 560.22		370			2		
		G	560.53	560.47 - 560.63		380			3		
43	37W	A	788.20	788.09 - 7-8.33		380			3		
		B	788.93	788.87 - 789.02		330			2		
		C	789.19	789.12 - 789.30		350			2		
		D	789.67	— — — — — —		370			2		

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JOB No. 140.06 AREA JAMES BAY LOWLANDS

FLIGHT No.	ANOMALY	FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
43	37W E	792.48	792.37 - 792.60		400			3		
	F	794.91	794.84 - 794.99		390			2		
	G	796.28	796.19 - 796.36		370			2		
	H	797.80	797.69 - 797.92		440			2		
	J	798.68	798.61 - 798.79		360			3		
	K	799.02	798.92 - 799.15		380			2		
	L	800.57	800.53 - 800.65		450			2		
43	38E A	747.48	747.25 - 747.58	0.3	390			6		
	B	747.93	— — — — — — —		390			2		
	C	748.27	748.18 - 748.33		370			3		
	D	748.64	748.54 - 748.75		400			3		
	E	749.30	749.22 - 749.35		380			3		
	F	749.68	749.60 - 749.75		390			3		
	G	752.57	752.43 - 752.66		380			3		
	H	753.00	752.92 - 753.06		360			3		
	J	753.30	753.20 - 753.38		350	50		2		
	K	753.89	753.79 - 753.97		400			2		
	L	754.45	— — — — — —		370			2		
	M	756.02	755.92 - 756.14	0.1	390			4		
	N	Zone	757.94 - 758.25		370			Zone		
44	39E A	849.30	849.06 - 849.38		350			3		
	B	856.27	— — — — — — — —		360			2		
	C	859.73	— — — — — — —		380	370		2		
	D	860.11	— — — — — — —		380			2		
	E	860.65	— — — — — — —		390			2		
43	40E A	536.40	536.35 - 536.48		400			3		
	B	543.10	542.97 - 543.17		380	190		2		

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JOB N°. 140.06 AREA JAMES BAY LOWLANDS

FLIGHT N°.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
43	40E	C	548.20	548.14 - 548.29		370			3		
43	41E	A	774.97	774.86 - 775.08	0.2	380			6		
		B	775.50	775.28 - 775.61	0.1	360			4		
		C	776.22	776.10 - 776.30	0.1	380			4		
		D	Zone	776.57 - 776.71		390			Zone		
		E	777.45	777.31 - 771.57		370			2		
		F	777.92	777.82 - 777.99	0.1	360			4		
		G	778.16	778.08 - 778.23		370			3		
		H	778.63	- - - - - - -		410	200		2		
		J	778.95	778.88 - 779.03		370			2		
		K	779.24	779.20 - 779.30		420			3		
		L	779.57	779.41 - 779.66	0.1	350			4		
		M	780.21	- - - - - - - -		380			2		
		N	781.14	781.07 - 781.21		360			3		
		P	781.46	781.35 - 781.56	0.1	370			6		
		R	782.00	781.91 - 782.10		390			2		
		S	782.66	782.53 - 782.96		380			3		
		T	784.65	784.49 - 784.75		380			3		
		W	785.08	785.00 - 785.15		390			3		
		X	785.87	785.77 - 785.97		390			3		
		Z	786.27	786.20 - 786.36		370			3		
		AA	786.84	786.68 - 786.93	0.2	340			5		
		BB	787.33	787.28 - 787.46		400			3		
43	42W	A	760.07	759.93 - 760.23		410			2		
		B	760.68	760.61 - 760.78		390			2		
		C	762.54	762.41 - 762.62		430			3		
		D	763.02	762.95 - 763.08		410			3		

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JOB N°. 140.00 AREA JAMES BAY LOWLANDS

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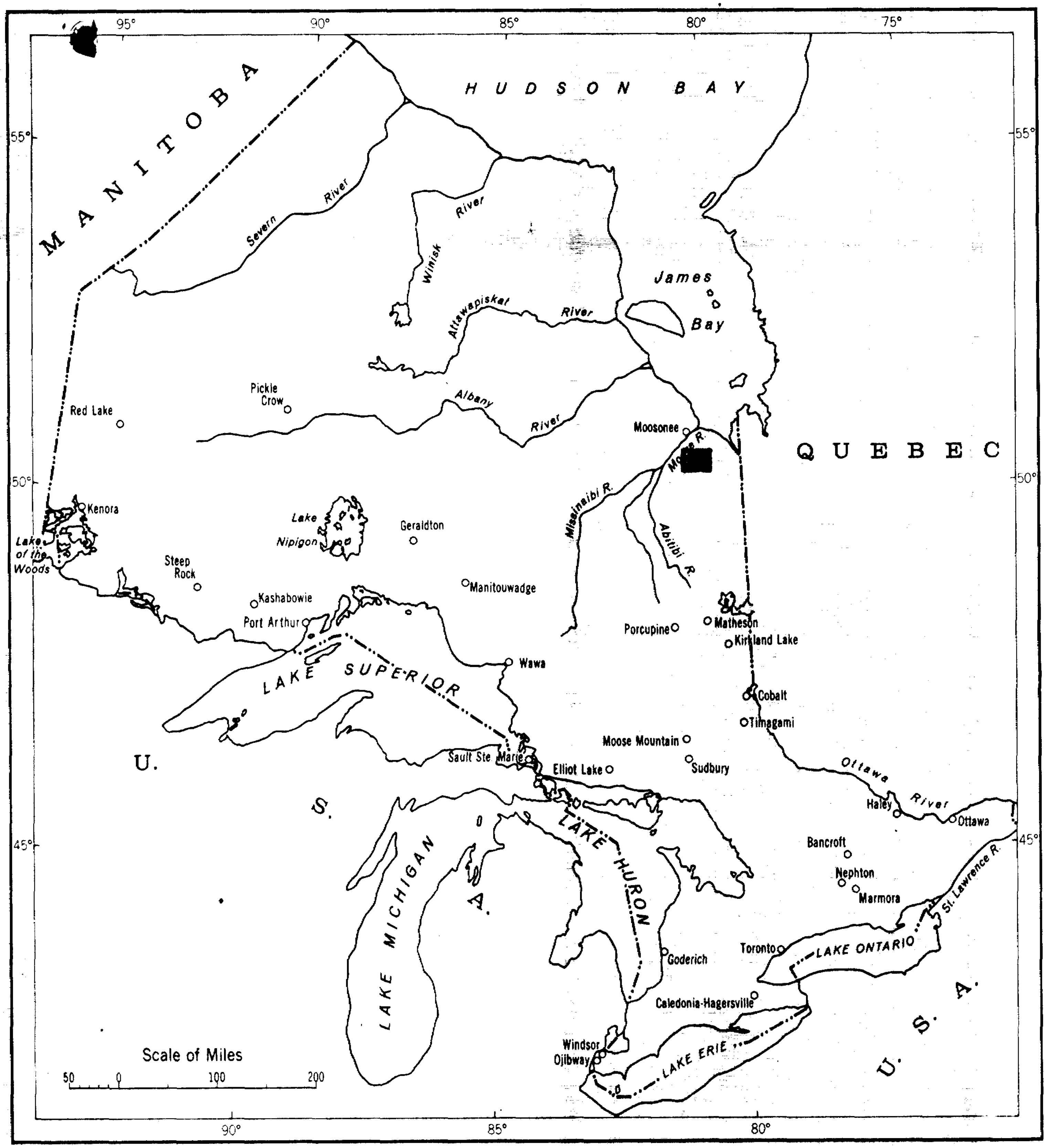
FLIGHT N°.	ANOMALY		FIDUCIAL	1/2 PEAK LIMITS — CHANNEL 2 —	AMPL. CH. 4	ALTITUDE	MAGNETIC CORREL.	MAGNETIC ASSOCIATION	DECAY TO CHANNEL	GAMMA RAY SPEC.	REMARKS
43	42W	E	763.32	763.23 - 763.42	0.1	390			4		
		F	765.51	-------		380			2		
		G	766.20	766.08 - 766.27		360			3		
		H	766.56	766.43 - 766.81		390			3		
		J	770.83	770.72 - 770.89		380			2		
		K	771.22	771.15 - 771.38		360			2		
		L	771.74	771.63 - 771.85		380			2		
		M	772.77	772.69 - 772.87	0.1	410			4		
		N	773.23	773.00 - 773.34		360			3		



AREA OF SURVEY


DEPT. OF MINES MAP -
SOUTH OF BUSHY ISLAND
M-2934
DEPT. OF MINES MAP -
SOUTH OF PARTRIDGE RIVER
M-2951
BLOCK "B"
BLOCK "D"
BLOCK "A"
DEPT. OF MINES MAP -
NORTH PART OF SOUTHBLUFF CREEK
M-2955
DEPT. OF MINES MAP -
FLINCH LAKE
M-2936
CONSOLIDATED MANITOBA MINES LTD.
JAMES BAY LOWLANDS
200

DECAY TO CHANNEL —
6 5 4 3 2

INPUT RESPONSE WITH DIRECT MAGNETIC ASSOC

NON MAGNETIC INPUT RESPONSE

HALF PEAK LIMITS — CHANNEL 2

ANOMALY LETTER & AMPLITUDE OF CHANNEL 4

CONDUCTIVE ZONE

RECOGNIZABLE ANOMALY EXTENSION

INDEX

D	A
C	B

CONSOLIDATED MANITOBA MINES LTD.

Airborne Mk. 5 INPUT Survey of

JAMES BAY LOWLANDS

1" = 1,320 Feet (approx.)

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SELCO EXPLORATION LTD.
Mosaic, Compilation & Drafting by:
BARRINGER RESEARCH LTD.
Toronto, Canada
April 1967

DWG. 6-140-1A

210

Magnetic declination 12°50' West

220

DECAY TO CHANNEL — 6 5 4 3 2

INPUT RESPONSE WITH DIRECT MAGNETIC ASSOC.

NON MAGNETIC INPUT RESPONSE

HALF PEAK LIMITS - CHANNEL 2

ANOMALY LETTER & AMPLITUDE OF CHANNEL 4

CONDUCTIVE ZONE

X RECOGNIZABLE ANOMALY EXTENSION

INDEX

D	A
C	B

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Airborne Mk. 5 INPUT Survey of

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63.2183

DWG. 6-140-1B

Magnetic declination 12°50' West

230

DECAY TO CHANNEL —
6 5 4 3 2

INPUT RESPONSE WITH DIRECT MAGNETIC ASSOC.
NON MAGNETIC INPUT RESPONSE
[ ] HALF PEAK LIMITS – CHANNEL 2
A, 0·4 ANOMALY LETTER & AMPLITUDE OF CHANNEL 4
CONDUCTIVE ZONE
X RECOGNIZABLE ANOMALY EXTENSION

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C	B

CONSOLIDATED MANITOBA MINES LTD.

Airborne Mk. 5 INPUT Survey of

JAMES BAY LOWLANDS

1/2 m 0 1/2 m
1" = 1,320 Feet (approx.)

63.21 S

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DWG. 6-140-1C

DECAY TO CHANNEL — 6 5 4 3 2

INPUT RESPONSE WITH DIRECT MAGNETIC ASSOC.

NON MAGNETIC INPUT RESPONSE

HALF PEAK LIMITS — CHANNEL 2

A, 0·4 ANOMALY LETTER & AMPLITUDE OF CHANNEL 4

CONDUCTIVE ZONE

X RECOGNIZABLE ANOMALY EXTENSION

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D	A
C	B

Magnetic declination 2° 50' West

240

CONSOLIDATED MANITOBA MINES LTD.

Airborne Mk. 5 INPUT Survey of

JAMES BAY LOWLANDS

1/2 m C 1/2 m

1" = 1,320 Feet (approx.)

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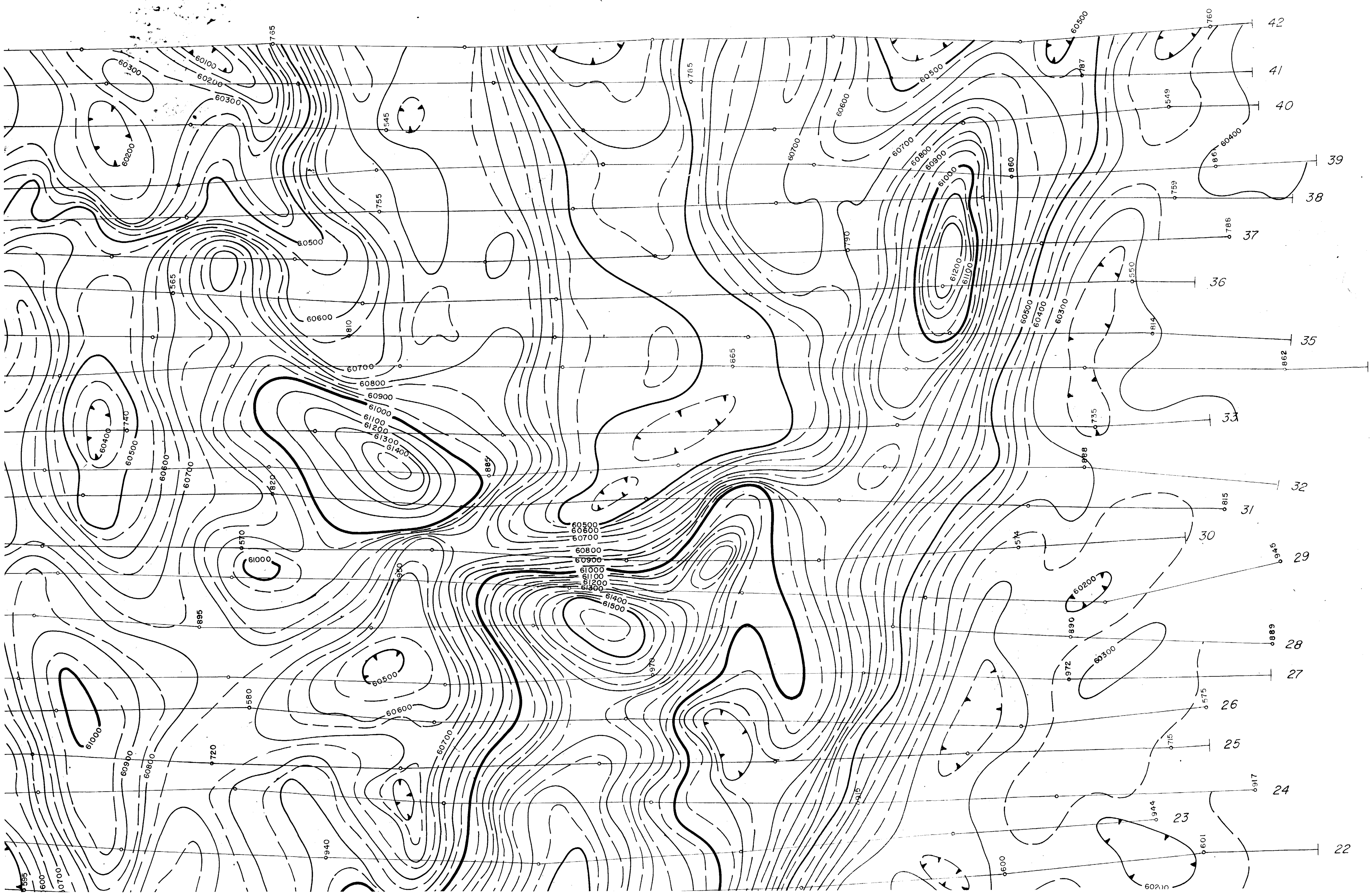

Magnetic declination 12°50' West

LEGEND

Contour interval 50 γ

1000 γ interval

500 γ interval

100 γ interval

50 γ interval

Depression

INDEX

D	A
C	B

250

CONSOLIDATED MANITOBA MINES LTD.

Aeromagnetic Survey

TOTAL INTENSITY CONTOURS

JAMES BAY LOWLANDS

1" = 1,320 Feet (approx)

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April 1967

DWG. 6-140-2A

LEGEND

Contour interval 50 γ

1000 γ interval

500 γ interval

100 γ interval

50 γ interval

Depression

INDEX

D	A
C	B

260

CONSOLIDATED MANITOBA MINES LTD.

Aeromagnetic Survey

TOTAL INTENSITY CONTOURS

JAMES BAY LOWLANDS

1" = 1,320 Feet (approx.)

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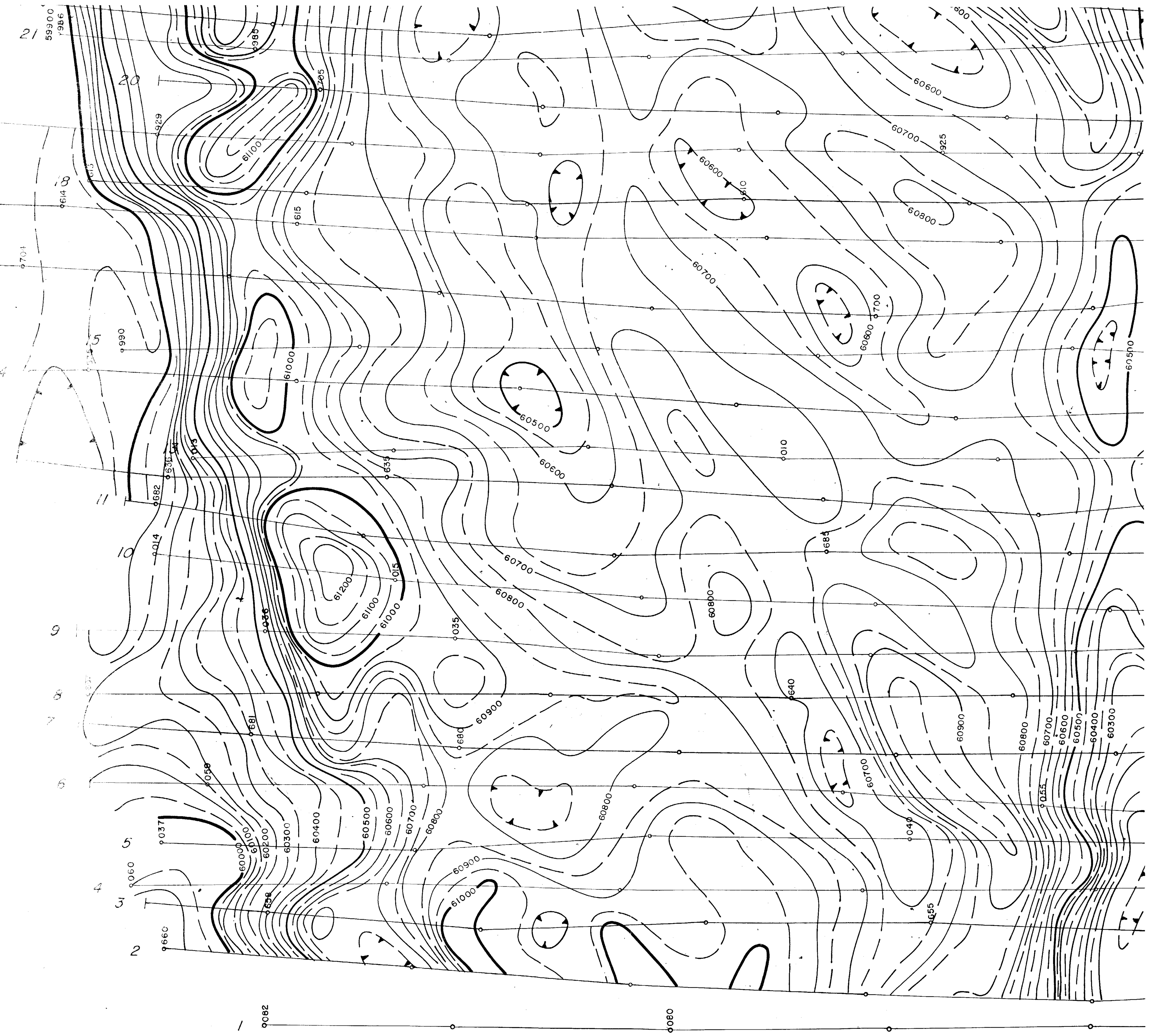
April 1967

DWG. 6-140-2B



LEGEND

Contour interval 50 γ

1000 γ interval

500 γ interval

100 γ interval

50 γ interval

Depression

INDEX

C

CONSOLIDATED MANITOBA MINES LTD.

Aeromagnetic Survey

TOTAL INTENSITY CONTOURS

JAMES BAY LOWLANDS

1" = 1,320 Feet (approx.)

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April 1961

DWG. 6-140-2C

Magnetic declination 12° 50' West

270

LEGEND

Contour interval 50 ɣ

1000 ɣ interval

500 ɣ interval

100 ɣ interval

50 ɣ interval

Depression

INDEX

D A

C B

Magnetic declination 12° 50' West

280

CONSOLIDATED MANITOBA MINES LTD.

Aeromagnetic Survey

TOTAL INTENSITY CONTOURS

JAMES BAY LOWLANDS

1" = 1,320 Feet (approx)

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April 1967

DWG. 6-140-2D