63.2968 (A)

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AIRBORNE ELECTROMAGNETIC SURVEY REPORT

FRECHEVILLE AREA, ONTARIO KL-2

THE PATINO MINING CORPORATION

FILE NO. 13017 JUNE 1971

AUTOPOSTIVES FILED SEPERATELY.

Questor Surveys Limited, 20 Canso Rd., Rexdale, Ontario, Canada.

INTRODUCTION

This report contains our interpretation of the results of an airborne electromagnetic survey and magnetic survey flown in the Frecheville Area, Ontario, on May 31, and June 1, 5, and 6, 1971. A brief description of the survey procedure together with recommendations for ground follow-up is included.

The survey totalled 710 line miles and was performed by Questor Surveys Limited. The survey aircraft was a Super Canso CF-JMS and the operating base was Rouyn, Quebec.

The area outline is shown in a 1:250,000 map at the end of this report. This is part of the National Topographic Series sheet number 32 D.

MAP COMPILATION

The base maps are uncontrolled mosaics constructed from 1" = 1320 feet Ontario Department of Lands and Forests photographs. These mosaics were reproduced at a scale of 1" = 1320 feet on stable transparent film from which white prints can be made.

Flight path recovery was accomplished by comparison of the prints of the 35 mm film with the mosaic in order to locate the fiducial points. These points are approximately one mile apart.

SURVEY PROCEDURE

Terrain clearance was maintained as close to 400 feet as possible, with the E.M. Bird at approximately 150 feet above the ground. A normal S-pattern flight path using approximately one mile turns was used. The equipment operator logged the flight details and monitored the instruments.

A line spacing of 1/8 mile was used.

INTERPRETATION AND RECOMMENDATIONS

Apparently the surveyed area is covered with basic volcanic rocks which have been undifferentiated on the published government geology maps. For the purpose of this report it is assumed that all of the ground conductors are within these volcanics and as a result, the geologic environment of the anomalies is not used as a criterion for priority targets in this report. It is left up to the client to weigh the conductors with regard to geology if more geologic information is in the hands of the client.

There were only a few ground targets found during the course of the survey, but most of these should be given attention on the ground. The conductors are numbered on the maps and are discussed briefly below.

Conductor #1

This two line conductor is weak, but it is felt that it is a legitimate bedrock conductor. It is difficult to say whether this conductor has good conductivity or not because of the weak response. However, it should definitely be considered in a ground investigation programme.

Conductor #2

A low priority is given to this conductor in the lake. Conductive lake bottom material is probably the cause.

Conductors #3, #4, and #5

All of these conductors are weak, but they appear to be legitimate bedrock conductors, and should therefore be investigated.

Conductor #6

This conductor appears to extend farther to the east, outside of the survey area. Formational sulphides and/or graphite along a geologic contact may be the cause of this zone. Ground work on a medium priority is recommended.

Conductor #7

This single line conductor is also weak, but it appears to be a legitimate bedrock anomaly. Ground work should be carried out on the conductor at the same time as work is being done on Conductor #6

Conductor #8

Ground work should be carried out on this conductor on a medium priority basis. The E.M. responses are weak, but there is good line to line correlation which could indicate a legitimate bedrock response.

Conductor #9

This is a high priority ground target. Intercept 126 A is a sharp, good conductivity anomaly with direct magnetic correlation. Sulphides have to be considered a cause for this conductor. If heavy overburden is suspected, a large loop vertical coil E.M. unit should be used.

Conductor #10

The east end of this long conductor should be considered on a ground programme. Intercepts 126 B, 127 B, and 128 A are all strong, good conductivity responses, similar to what could be expected over sulphides or graphite.

Conductors #11 and #12

Both of these zones are weak, but they are bedrock conductors. If considerable overburden is anticipated, then these conductors would be more attractive.

Conductor #13 not mentioned due to oversight. Dave Watson believes due to swamp.

Conductor #14

This short conductor has to be considered as a high priority target. Intercept 175 A is a strong good conductivity anomaly similar to what could be expected over massive sulphides.

Conductors #15, #16 and #17

All three of these one line conductors are weak and may be difficult to locate on the ground. On such weak responses, it is difficult to get an indication of the conductivity and they may be caused by surface effects. They are therefore low priority ground conductors.

D. Watson

APPENDIX

EQUIPMENT

The aircraft are equipped with Mark V INPUT airborne E.M. systems and Barringer AM-101 proton precession magnetometers. APN-1 radio altimeters are used for vertical control. The outputs of these instruments together with fiducial timing marks are recorded by means of galvanometer type recorders using light sensitive paper. Thirty-five millimeter continuous strip cameras are used to record the actual flight path.

(I) MARK V INPUT(R) SYSTEM

The Induced Pulse Transient (INPUT) system is particularly well suited to the problems of overburden penetration. Currents are induced into the ground by means of a pulsed primary electromagnetic field which is generated in a transmitting loop around the aircraft. By using half sine wave current pulses and a loop of large area-turns, the high output power needed for deep penetration is achieved.

The induced current in a conductor produces a secondary electromagnetic field which is detected and measured after the termination of each primary pulse. Detection is accomplished by means of a receiving coil towed behind the aircraft on five hundred feet of cable, and the received signal is processed and recorded by equipment in the aircraft. Since the measurements are in the time domain rather than the frequency domain common to continuous wave systems, interference effects of the primary transmitted field are eliminated. The secondary field is in the form of a decaying voltage transient originating in time at the termination of the transmitted pulse. The amplitude of the transient is, of course, proportional to the amount of current induced into the conductor and, in turn, this current is proportional to the dimensions, the conductivity and the depth beneath the aircraft.

The rate of decay of the transient is inversely proportional to conductivity. By sampling the decay curve at six different time intervals, and recording the amplitude of each sample, an estimate of the relative conductivity can be obtained. By this means, it is possible to discriminate between the effects due to conductive near-surface materials such as swamps and lake bottoms silts, and those due to genuine bedrock sources. The transients due to strong conductors such as sulphides exhibit long decay curves and are therefore commonly recorded on all six channels. Sheet-like surface materials, on the other hand, have short decay curves and will normally only show a response in the first two or three channels.

The samples, or gates, are positioned at 300, 500, 700, 1100, 1500 and 1900 micro-seconds after the cessation of the pulse. The widths of the gates are 200, 300, 400, 600, 600, and 600 micro-seconds respectively.

For homogeneous conditions, the transient decay will be exponential and the time constant of decay is equal to the time difference at two successive sampling points divided by the log ratio of the amplitudes at these points.

(II) BARRINGER AM-101A PROTON PRECESSION MAGNETOMETER

The AM-101A magnetometer which measures the total magnetic field has a sensitivity of 5 gammas and a range from 20,000 gammas to 100,000 gammas.

Because of the high intensity field produced by the INPUT transmitter, the magnetometer results are recorded on a time-sharing basis. The magnetometer head is energized while the transmitter is on, but the read-out is obtained during a short period when the transmitter is off. Using this technique, the head is energized for 1.15 seconds and then the transmitter is switched off for 0.15 seconds while the precession frequency is being recorded and converted to gammas. Thus a magnetic reading is taken every 1.3 seconds.

DATA PRESENTATION

The symbols used to designate the anomalies are shown in the legend on each map sheet, and the anomalies on each line are lettered in alphabetical order in the direction of flight. Their locations are plotted with reference to the fiducial numbers on the visicorder record.

A sample record is included at the end of the report identifying the method used to correct for the position of the E.M. "Bird" and identifies the parameters on each channel. Occasionally, a question mark may be shown alongside the anomaly symbol. This may occur when the response is very weak and there is some doubt as to whether or not it is caused by turbulence of compensation noise caused by large changes in the positon of the "bird" relative to the aircraft.

All the anomaly locations, magnetic correlations, and the amplitudes of channel number 4 are listed on the data sheets accompanying the final maps.

GENERAL INTERPRETATION

The INPUT system will respond to conductive overburden and near-surface horizontal conducting layers in addition to bedrock conductors. Differentiation is based on the rate of transient decay, magnetic correlation and the anomaly shape together with the conductor pattern and topography.

Power lines sometimes produce spurious anomalies but these can be identified by reference to the monitor channel.

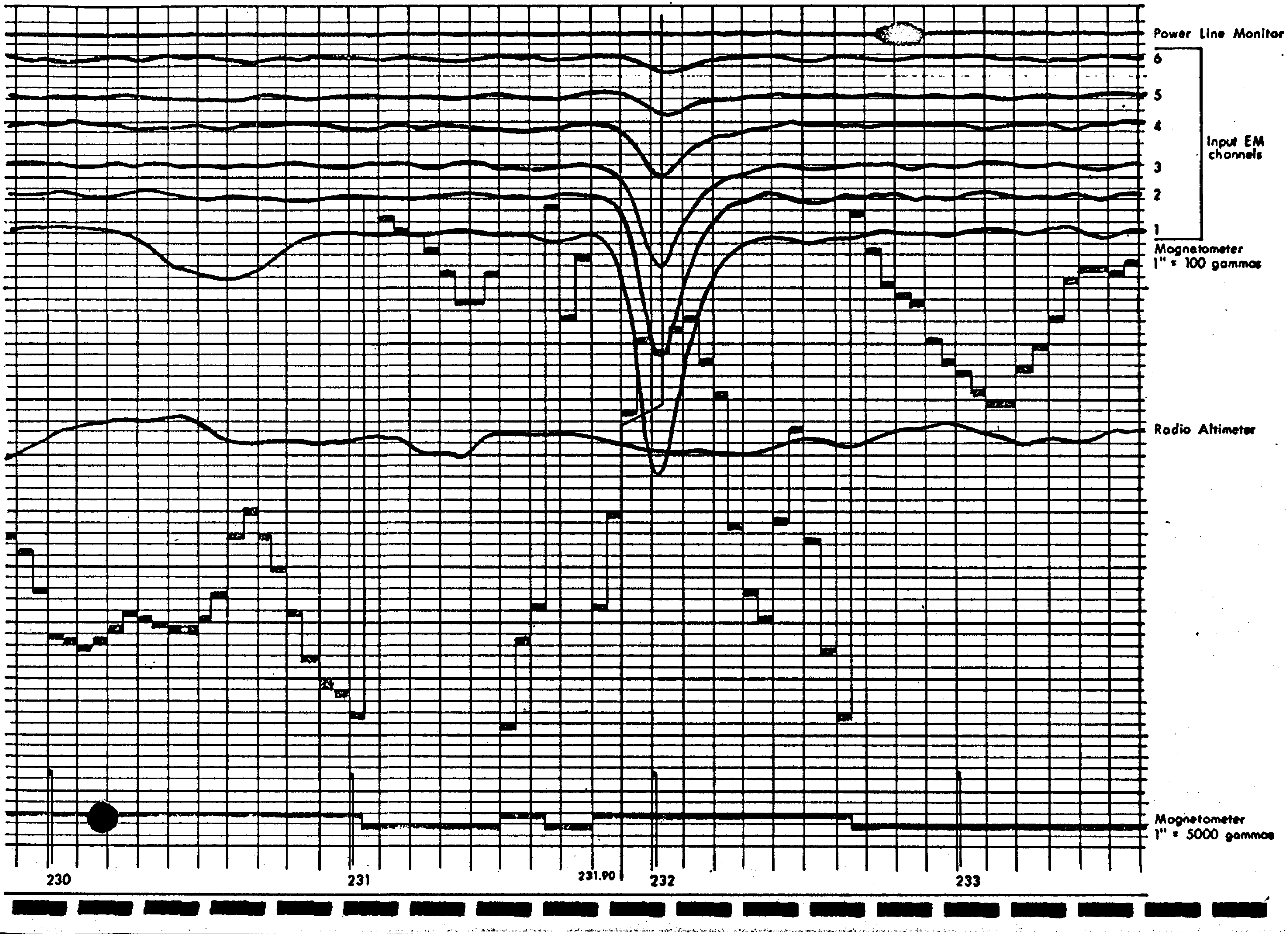
Railroad and pipeline responses are recognized by studying the film strips.

Graphite or carbonaceous material exhibits a wide range of conductivity. When long conductors without magnetic correlation are located on or parallel to known faults or photographic linears, graphite is most likely the cause.

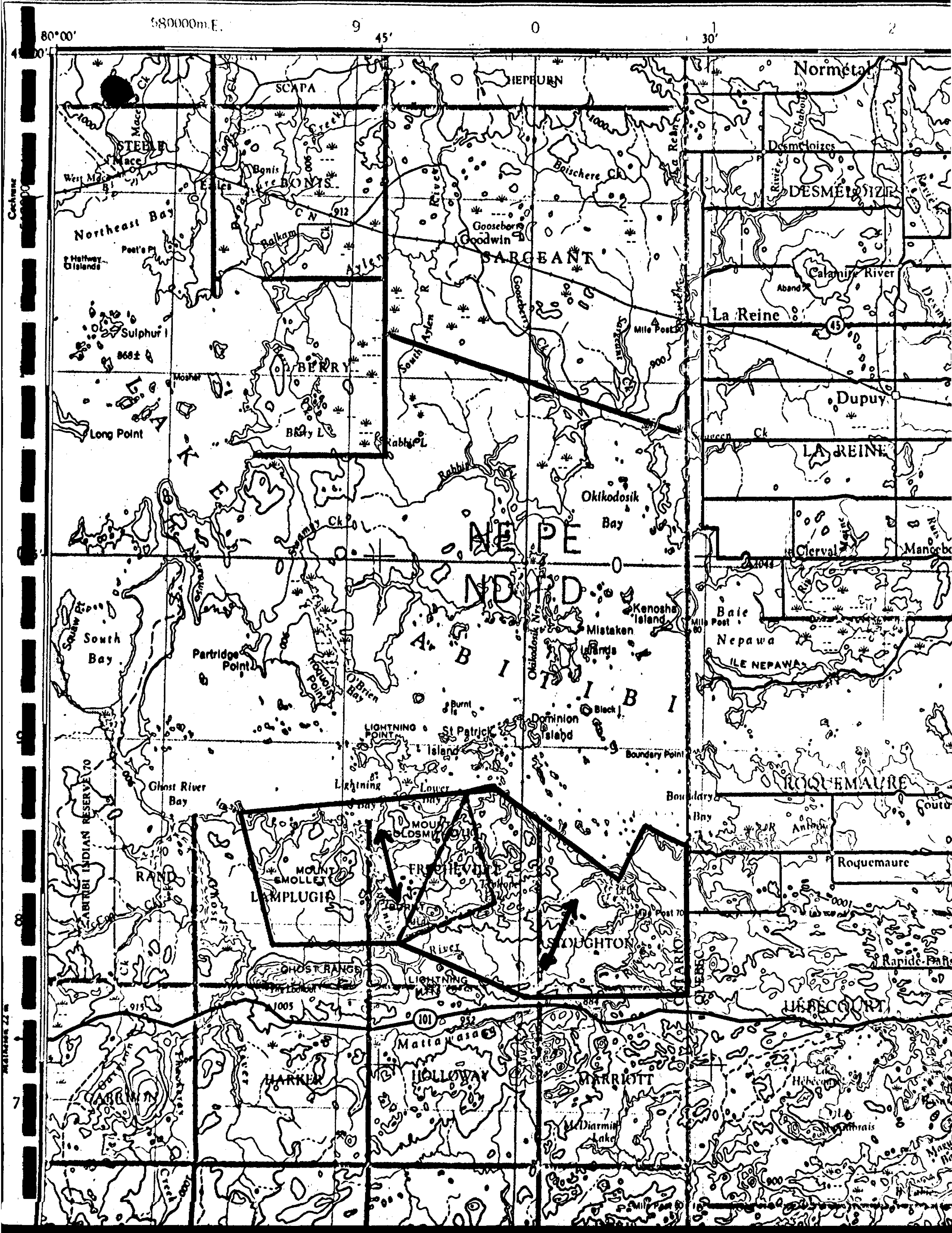
Contact zones can often be predicted when anomaly trends coincide with the lines of maximum gradient along a flanking magnetic anomaly. It is unfortunate that graphite can also occur as relatively short conductors and produce attractive looking anomalies. With no other information than the airborne results, these must be examined on the ground.

Serpentized peridotites often produce anomalies with a character that is fairly easy to recognize. The conductivity which is probably caused in part by magnetite, is fairly low so that the anomalies often have a fairly large response on channel #1; they decay rapidly, and they have strong magnetic correlation. INPUT E.M. anomalies over massive magnetites show a relationship to the total Fe content. Below 25 - 30%, very little or no response at all is obtained, but as the percentage increases the anomalies become quite strong with a characteristic rate of decay which is usually greater than that produced by massive sulphides.

Commercial sulphide ore bodies are rare, and those that respond to airborne survey methods usually have medium to high conductivity. Limited lateral dimensions are to be expected and many have magnetic correlation caused by magnetite or pyrrhotite. Provided that the ore bodies do not occur within formational conductive zones as mentioned above, the anomalies caused by them will usually be recognized on an E.M. map as priority targets.



Power Line Monitor
6
5
4
3
2
1
Input EM channels
Magnetometer 1" = 100 gammas
Radio Altimeter
Magnetometer 1" = 5000 gammas
230
231
231.90
232
233



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Normétal
SCAPA
HEPBURN
STEELE
BONIS
Northeast Bay
Halfway Islands
Sulphur I
BERRY
Long Point
Berry L
Rabbit L
Goodwin L
SARGEANT
La Reine
Mile Post
Dupuy
LA REINE
Desmeloizes
DESMELOIZES
Calamite River
Okikodosik Bay
LAKE
NEPE
NDYD
ABITIBI
Clerval
South Bay
Partridge Point
Iroquois Point
O'Brien Bay
Burnt Is
Kenosha Island
Mistaken Islands
Baie Nepawa
ILE NEPAWA
Black I
Dominion Island
LIGHTNING POINT
St Patrick Island
Boundary Point
Ghost River Bay
ABITIBI INDIAN RESERVE 70
Lightning Bay
Lower Bay
MOUNT SMOLLETT
LAMPLUGH
FRECHEVILLE
RAND
STOUGHTON
ROQUEMAURE
Roquemaure
Boundary Bay
GHOST RANGE
LIGHTNING
ONTARIO
QUEBEC
HÉBÉCOURT
Rapide-Danseur
101
Mattawasaga
HARKER
HOLLOWAY
MARRIOTT
McDiarmid Lake
CARMAN
Cochrane

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Area FRECHEVILLE

File No. 13017

Page No. 1

Anomaly Number	Fiducial	Number of Channels	Channel 4 Amplitude	Direct Magnetic Correlation	Flanking Magnetic Peak		Remarks
					Location	Value	
73 A.	406.50	3	—	—	406.55	40 γ	SHOULDER MAG
74. A.	401.67	3	—	—	401.60	30 γ	
76 A.	378.82	2	—	—	378.75	210 γ	
77 A.	367.90	2	—	220 γ			
78 A.	357.76	2	—	150 γ			
83 A.	396.46	2	—	—			
84 A.	386.55	2	—	—			
88 A.	343.78	2	—	—	343.70	110 γ	
89 A.	330.52	3	—	—			
B.	333.67	2	—		333.55	100 γ	
90 A.	319.85	3	—	—			
B.	322.98	2			322.90.	90 γ	
91 A.	308.20	3	—	—			
92 A.	297.57	3	—	—			
93 A.	288.03	3	—	—			
94 A.	277.58	3	—	—			
B.	.80	3	—	—	277.85	60 γ	
107 A.	237.31	2	—	—			
108 A.	228.19	3	—	—			
115 A.	224.63	2	—	—			
116 A.	213.78	3	—	—			

Questor Surveys Limited

Area FRECHEVILLE

File No. 13017

Page No. 2

Anomaly Number	Fiducial	Number of Channels	Channel 4 Amplitude	Direct Magnetic Correlation	Flanking Magnetic Peak		Remarks
					Location	Value	
117 A.	199.20	3	-	-			
118 A.	741.99	2	-	-			
119 A.	728.16	3	-	-			
120 A.	721.15	3					
121 A.	705.80	4	.05				
122 A.	691.47	2	-	-	691.30	30γ	
B.	.88	3	-	-			
123 A	676.98	4	.10	-	676.85	100γ	
B	677.30	3	-	-			
124 A.	663.92	4	.10		663.80	130γ	
B.	664.27	3	-	-			
125 A.	646.64	3	-	80γ			
B.	649.86	4	.10		649.65	80γ	
126 A.	632.70	6	.30	20γ			
B.	635.86	5	.22		635.80	10γ	
127 A.	618.57	3	-	120γ			
B.	621.72	5	.20	-	621.60	60γ	
128 A.	609.19	5	.20		609.10	100γ	
129. A	595.84	4	.06		595.20	60γ	
130 A.	581.39	3	-	-			

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Area FRECHEVILLE

File No. 13012

Page No. 3

Anomaly Number	Fiducial	Number of Channels	Channel 4 Amplitude	Direct Magnetic Correlation	Flanking Magnetic Peak		Remarks
					Location	Value	
145 A	301.92	2	–	–			SWAMP
146 A.	284.20	3	–	–			SWAMP
169 A.	053.90	2	–	–	053.85	180 γ	
175 A.	157.70	6	–	–	152.90	80 γ	
176 A.	176.32	4	.05 γ	–	126.38	80 γ	
177 A.	183.89	3	–	–	183.82	560 γ	
186 A	238.98	2	–	–	238.90	500 γ	

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PROJECTS SECTION

REPORT OF GEOLOGICAL AND GEOPHYSICAL SURVEYS AND DIAMOND DRILLING IN THE ABITIBI LAKE AREA, ONTARIO

TOWNSHIPS OF LAMPLUGH, FRECHEVILLE, STOUGHTON & MARRIOTT

FOR THE PERIOD SEPTEMBER 1 - NOVEMBER 30, 1971.

THE PATIÑO MINING CORPORATION

TORONTO

NOVEMBER, 1971

J. A. BOYD.

INTRODUCTION:

An airborne geophysical survey was flown, in the Kirkland Lake area of Ontario, for the Patiño Mining Corporation in June, 1971. The survey was flown by Questor Surveys Ltd. of Toronto and consisted of an INPUT electromagnetic and a total force magnetic survey.

Sixteen anomalies were located and investigated on the ground. Six groups, totalling fifty-four claims, were staked on the most interesting anomalies.

This report is submitted in compliance with the requirements of the Exploration Assistance Agreement between the Ontario Department of Mines and Northern Affairs and The Patiño Mining Corporation.

The report describes detailed geophysical and geological work performed on seven of these groups and the subsequent diamond drilling of four of them.

CONCLUSIONS:

Four of the anomalies proved to have conductors of sufficient interest to warrant investigation by diamond drilling. One hole was drilled on each anomaly.

The drill holes intersected conductors but, in each case, these proved to be graphitic tuffs and agglomerates and of no economic interest.

A fifth anomaly, No. 18 in Claim Group C was found to lie over ultra-basic rocks. This group was prospected with a view to locating nickel-bearing sulphides in the peridotite. No sulphides were found.

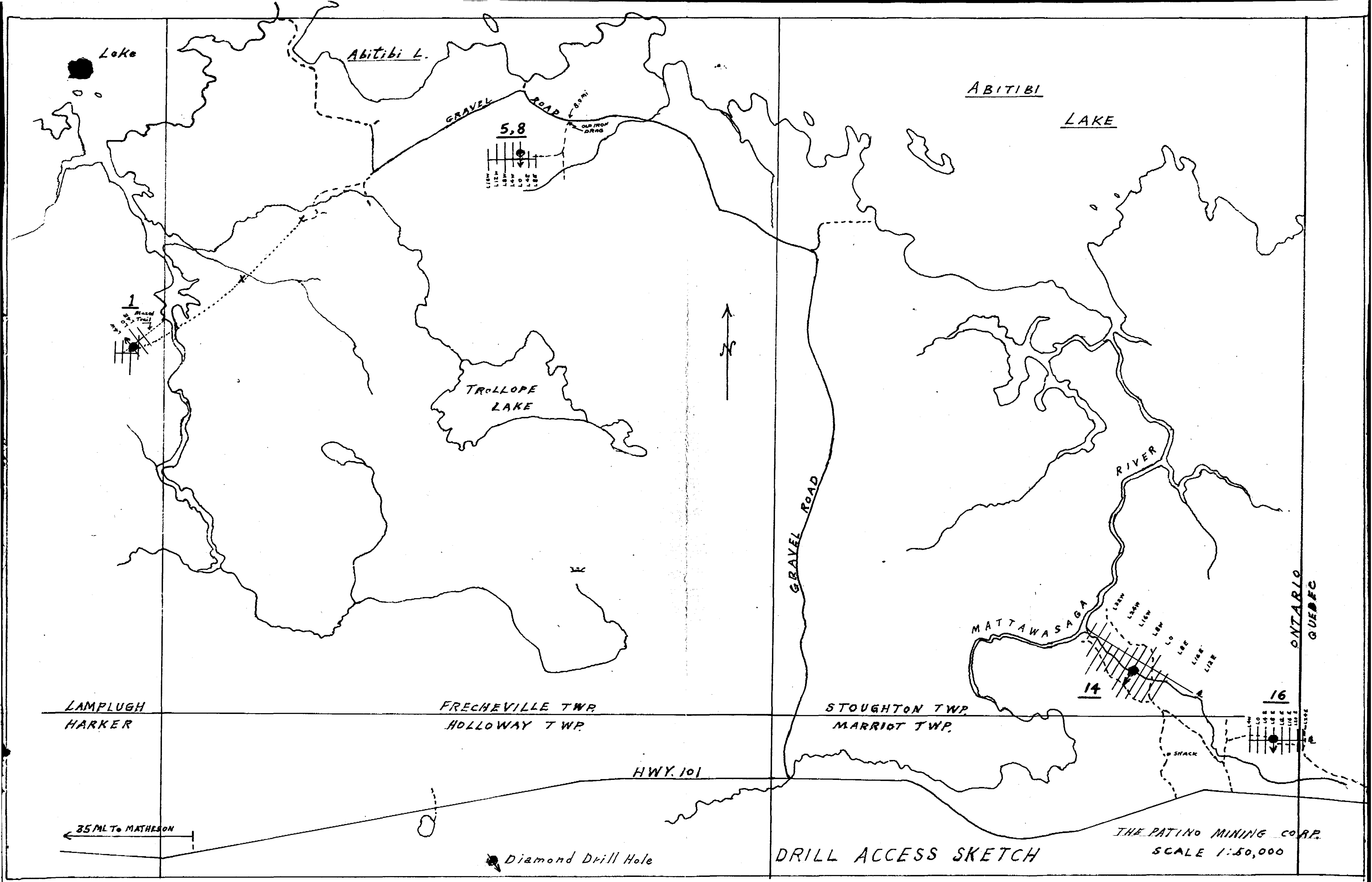
LOCATION:

All the anomalies were located between Highway 101 and the south shore of Lake Abitibi and lie 35 to 45 miles east of the town of Matheson.

More particularly, the claim group locations are as follows:

Group A (Anomaly 1)	- Lamplugh Township
Groups B, C & D	- Frecheville Township
Group E	- Stoughton Township
Group F	- Marriott Township.

All groups, and the limits of the airborne survey, are shown on the accompanying property plan.



Lake
Abitibi L.
ABITIBI
LAKE
GRAVEL ROAD
5,8
OLD IRON DRAG
1
Blazed Trail
TROLLOPE
LAKE
N
GRAVEL ROAD
RIVER
MATTAWASAGA
14
16
SHACK
ONTARIO
QUEBEC
LAMPLUGH
HARKER
FRECHEVILLE TWP.
HOLLOWAY TWP.
STOUGHTON TWP.
MARRIOT TWP.
HWY. 101
35 MI. To MATHESON
Diamond Drill Hole
DRILL ACCESS SKETCH
THE PATINO MINING CORP.
SCALE 1:50,000

ACQUISITION OF CLAIMS:

Fifty-four claims in six groups were staked by employees on behalf of the company. The groups and their respective claims are listed below:

Group	Anomaly No.	Township	Claim Numbers	
A	1	Lamplugh	L296800-803	(4)
B	6,7,10,11,12	Frecheville	L317904-923	(20)
			L317009-318001	(4)
C	18	Frecheville	L296810-815	(6)
D	5,8	Frecheville	L296804-809	(6)
E	14,15	Stoughton	L296792-799	(8)
			L318440-442	(3)
F	16	Marriott	L318438-439	(2)
			L318443	(1).

ACCESS:

Access to the area is fairly good. Highway 101 runs east-west along the southern boundary and various winter pulp roads run north from it. The bush roads are in poor to very poor condition with numerous washouts but were generally useable.

A 12 mile gravel road extends north and west to Lake Abitibi from a point near the Mattawasaga River bridge on Highway 101. This road provides access to Claim Group D and a departure point for travel to Anomalies 4,3 and 1.

The bush itself is full of down timber and slash from old pulp operations which made traversing and linecutting more difficult than usual.

TOPOGRAPHY:

The area is one of generally low relief with a maximum of 400 feet. Drainage is to the north into Lake Abitibi via the Mattawasaga and Lightning Rivers which are slow and meandering. There is moderate low relief around Lake Trollope where some hills rise two to three hundred feet above the lake level. Extensive sand flats occur along the boundary of Frecheville and Stoughton Townships. The valleys are filled with glacial clays and fine sand to depths exceeding 100 feet.

GENERAL GEOLOGY:

The area lies immediately north of the Destor-Porcupine Fault in a belt of volcanic rocks of Archean age that extends westward through Frederick House Lake as far as Kidd Township. Sketchy reconnaissance mapping indicates that the rocks are chiefly basic flows and pyroclastics, with some basic intrusives and acid flows.

There is considerable outcrop in the northern part of Frecheville Township, but there is extensive overburden in Stoughton Township and in the central parts of Frecheville and Lamplugh Townships.

Rocks noted in the vicinity of the anomalies included diabase, gabbro and peridotite, andesite, dacite and rhyolite and related tuffs and agglomerates.

PREVIOUS WORK:

Very little exploration work has been reported in the survey area. Until the construction of Highway 101, access was difficult. Some cursory prospecting was done from Lake Abitibi.

A gold showing was reported on the shore of Boundary Bay in Stoughton Township, also a zinc showing (now flooded) on the Ghost River in Rand Township. Some exploration was done for asbestos in the ultrabasic at the south boundaries of Lamplugh and Frecheville Townships.

The area has been flown previously with a variety of airborne electromagnetic equipment and at various flight-line spacings. It was felt that INPUT equipment and 1/8 mile line-spacing would provide better coverage, resolution, and depth penetration than the preceding surveys.

Two of the stronger INPUT anomalies were found to have been located and drilled. One was our Conductor No. 9 about one mile northeast of Trollope Lake and the other was in the Trollope Lake Claim Group B. In each case core observed at the hole collars showed barren sulphides and graphite.

CURRENT WORK:

The Questor survey located seventeen conductors, as listed in their report which is appended to this one. Also, an eighteenth conductor was imprecisely located to the south of the survey limits as the aircraft made a turn between flight lines. The conductors were numbered 1 to 18 as in the Questor report, the turn-around conductor being No. 18.

It was possible to locate all the conductors quite accurately on the ground with the aid of the four miles to one inch air-photo mosaic, and the 35 millimetre film strip of the flight paths.

From the preliminary work the conductors were categorized as follows:

Nos. 2 and 13	- located in a lake and swamp respectively
	- considered to be due to surface conductors
	- no further investigation.
Nos. 3,4,15,17	- considered to be weak, possibly surface conductors
	- checked on the ground with vertical and horizontal loop E.M. equipment and no conductors located
	- no further investigation of Nos. 15 and 17.
No. 9	- good conductor, partially exposed on a ridge.
	- drilled by previous investigators
	- core found near hole collar and consisted of andesite and tuffs with barren pyrite and pyrrhotite and graphite.
	- some disseminated pyrrhotite in adjacent rock
	- no further investigation.
Nos.6,7,10,11,12	- conductivity ratings were good to weak but all considered to be bedrock.
	- twenty-four claims staked (Group B)
	- work included line grid, horizontal and vertical loop E.M. survey, magnetometer survey and geological mapping.
	- two existing drill holes and core located on best conductors No. 7 and 10. The core included widths to 200 feet of graphitic tuff and agglomerate

	- no further investigation.
No. 1	- weak bedrock conductor
	- four claims staked (Group A)
Nos. 5, 8	- weak conductor
	- six claims staked (Group D)
No. 14	- good strong conductor
	- eleven claims staked (Group E)
No. 16	- weak conductor
	- on easternmost flight line, could be end of a more extensive conductor.
	- three claims staked (Group F).
No. 18	- turn-around anomaly, location unreliable
	- considered interesting due to presence of ultrabasic rocks.
	- six claims staked (Group C).

The most recent work was done on conductors 1, 5-8, 14, 16 and 18. Some further check-work was also done on anomalies 3 and 4. This work is detailed below and plans, profiles and sections are included.

All conductors are covered by varying thicknesses of glacial clays. The masking and attentuating effect of these clays could have resulted in weak INPUT anomalies actually being due to larger and stronger bedrock conductors than indicated.

CONDUCTOR NO. 1:

This conductor is two miles up stream and half a mile west of the Lightning River in Lamplugh Township. It was a three channel INPUT anomaly on two adjacent flight lines and appeared to strike southeast-northwest.

A flanking magnetic high was indicated 350 feet to the northwest.

A line grid was cut with zero at the claim post in the centre of the four claim group.

The initial SE200 (vertical coil E.M.) search survey indicated a possible conductor trending southeast but the standard method check survey failed to show a well-defined conductor. However, a conductor striking N55°E, was located northeast of the plotted A.E.M. position.

Another small grid was cut with zero at 6+00N, on line 8+00E on the first grid. The SE 200 equipment was used on three lines, and the SE600 in horizontal coil mode was used to check this conductor. The SE200 indicated a weak to moderate strength conductor for which the SE600 showed a poor conductivity.

The conductor lies in a 500 foot wide valley between a low ridge of andesite to the southeast and a more pronounced ridge of diabase some 250 feet to the northwest. A reconnaissance magnetic survey showed no correlation with the EM conductor but did show a 6,000 to 8,000 gamma relief over the diabase ridge.

Overburden was estimated to be fairly deep, and the target considered as one of medium priority.

A drill-hole was collared at Line 4+00 West (Baseline 2) and 1+30 South. The hole was directed N35°W at a dip of 50 degrees.

Overburden proved to be 52 feet deep, vertically, of which 24 feet was clay, the rest fine sand and some gravel. Rocks intersected were acid to intermediate tuffs and agglomerates and dacite. The pyroclastics contain 2 to 7% disseminated sulphides. The sulphides are pyrite, minor pyrrhotite, plus a few grains of chalcopyrite. Core angles indicate that the rocks dip 75 to 80 degrees north.

A graphitic section of tuffs, from 228 to 257 feet in the hole, is considered to be the cause of the anomaly.

CONDUCTORS 3,4:

These weak conductors had been checked with the SE600 equipment in the horizontal coil mode. The operator concluded that he was getting typical clay effects in each case and that there were no vertical ground conductors. Examination of the profiles suggested that there was evidence of a poor conductor at the south end of the search grid.

Both grids were subsequently extended and each area checked with the SE200 vertical coil equipment. No 'cross overs' (conductors) were located. A reconnaissance magnetometer survey on Area No. 3 showed no significant pattern.

CONDUCTORS No. 5-8:

Conductors 5 and 8 are the result of flying over the same conductor with two different flight directions. It is essentially three 3-channel intercepts striking east-southeast over a length of 1,000 feet.

A grid was set up over the conductor on the centre east-west claim line with zero at Post 1 of claim 296807.

A horizontal coil SE 600 survey was completed over the lines, and also a magnetometer survey. A relatively poor but definite conductor was located with a length of 800 feet,plus weaker extensions, and striking N65°W-S65°E. It was concluded that the conductor was near-surface, steeply - dipping, less than 100 feet wide, and not very conductive, with some slight, indirect magnetic relief.

The SE200 vertical coil equipment was used to do a standard method check-survey over three lines. Moderate strength 'cross-overs' were obtained and the conductor was recommended for drilling.

The conductor is covered with overburden (clay and fine sand) but an outcrop of andesite lies a few hundred feet north. The outcrop area is 600 feet by 1,200 feet and includes a fifty foot wide band of tuffs. The tuffs strike N65°W and dip vertically to 85°N. To the south and west there are extensive outcrops of medium to fine-grained, massive andesite with ridges and hills rising two to three hundred feet.

A drill hole was collared at 2 +75N on Line zero and directed south at a dip of 50 degrees. The sandy overburden at the collar was 12 feet deep vertically. The rocks encountered are andesite and related tuff and agglomerate, and two short sections of a quartz-feldspar porphyry. The porphyry is probably an intrusive (sill). Three sections of graphitic tuff and agglomerate occur from 181 to 299 in the hole and are the source of the anomaly. Five to seven percent pyrite is associated with the tuffs as disseminations, fracture-fillings with calcite, and occasionally replacing fragments. Chalcopyrite was noted with pyrite in a minute fracture at 295 feet.

CONDUCTOR NO. 14:

A six and a four channel intercept on two flight lines produced a short, strong, conductive airborne anomaly that was considered to be a priority target. It is near a northwest-flowing creek that runs into the Mattawasaga River and is 1.4 miles north of Highway 101.

A 6,400 foot baseline, bearing N60°W, was laid out roughly parallel to the creek and lines cut from it, with Line zero at the junction of the baseline and an old bush road.

An SE600 horizontal-loop survey was run over four lines nearest to the airborne anomaly locations. Heavy clay cover observed in the area made interpretation difficult but a definite conductor was indicated. Ratios were considered reasonably good and conductivity was rated as weak to moderate. A short, weaker, sub-parallel conductor was also interpreted 300 to 400 feet south of the main one.

A vertical loop SE200 survey was done over ten lines. Moderate to weak tilt angles indicated a conductor in excess of 1,600 feet long in the area of the two airborne anomalies. The conductor width was estimated at a maximum 100 feet. A magnetometer survey over the conductor indicated no direct correlation. A vertical loop check-survey was made over lines 4+00W, 8+00W, and 13+30W to confirm the two sub-parallel conductors. The northern one was rated to have only moderate strength and conductivity, and conductive clay overburden effects were noted. The southern conductor was rated weak but definite and probably due to conductive overburden.

Small scattered outcrops show rhyolites to the north and andesite to the south with a possible contact along the line of the creek. One to two per cent disseminated pyrite was noted at 10+00S on Line 8+00E, and near lines 20+00W and 24+00W on the creek bank on strike with the main conductor.

The importance of the conductor was thus down-graded to some extent by geophysics but it was still considered worth drilling. A hole was collared at Line 8+00W on the north bank of the creek and drilled south at 50°, considerable difficulty was experienced with overburden. The hole flattened markedly and bedrock was reached at 148 feet. Overburden was 98 feet vertically of which 53 feet was clay and the remainder sand and gravel. The hole collared and remained in a graphite "schist". This rock, probably a tuff, has the bedding obscured, and contains 40 to 50 percent graphite and 10 percent fine - grained, disseminated pyrite plus numerous pyritic nodules. Core recovery was poor and caving very bad and the hole was abandoned before penetrating the full thickness of the graphitic rock, which undoubtedly was the cause of the anomaly.

CONDUCTOR NO. 16:

This two-channel, single line anomaly was rated by Questor as weak, possibly due to surface effects. Since the anomaly appeared on the last flight line at the eastern limit of the survey area, it was necessary to check to find out if it was actually the end of a stronger conductor striking to the east. It is one and a half miles southeast of No. 14 and half a mile north of Highway 101. An east-west baseline was laid out in the centre of the claims and lines cut from it.

The SE600 vertical coil instrument located and traced the conductor over an east-west strike length of 2,500 feet. The best 'cross-overs' were located between line zero and line 16+00E. The SE600, in horizontal coil mode, was used to check lines zero and 8+00E. The phase ratios were indicative of a good, strong conductor.

A magnetometer survey disclosed no direct magnetic correlation with the conductor but a parallel magnetic high lies about 300 feet south and has a relief of several hundred gammas. The magnetic high is due to a diabase sill which strikes east-west and is exposed at 4+00S on Line 12+00E. and on the bush road 150' west of the west claim boundary.

Small, scattered outcrops a few hundred feet north of the conductor are medium-grained, massive andesite.

No. 16 was considered to be a definite bedrock conductor, with clean, strong electrical indications, and a good drill target.

A drill hole was collared at 50 feet north on Line 8+00E and drilled south at 50 degrees. Overburden at the collar was 82 feet vertically of which the upper 55 feet was clay, and the remainder fine sand. The hole intersected intermediate, well-bedded, partly altered tuffs. From 158 to 223 feet in the hole the tuffs are graphitic and carry 5% to 10% disseminated pyrite. The most highly graphitic section is from 194 to 211 feet. The graphitic section is the cause of the conductor. Core angles indicate a rock dip of about 80° north. A trace of chalcopyrite was noted at 141 feet. An assay from 138 to 144 feet reported 0.07% copper and nil zinc and gold.

CONDUCTOR-NO. 18:

As stated above this 'turn-around' anomaly was not considered to be accurately enough located for inclusion by Questor in their final report. However, a preliminary report described it as a five channel anomaly and gave a fairly precise location. Six claims were staked on it.

The claims oover a portion of Lightning Mountain (largely andesite), with a relief in excess of 100 feet, and low ground to the south and west which is underlain by peridotite. It was decided to prospect the peridotite with a view to locating disseminated sulphides which might be nickel-bearing. No sulphides were found.

A reconnaissance magnetometer survey outlined the magnetite-rich portion of the peridotite band which strikes west to northwest across the claims and has a local magnetic relief of from 10,000 to 20,000 gammas.

A composite spectrographic analysis of the peridotite reported estimates of 0.2% chrome, 0.1% each for nickel, manganese and titanium and 3% iron.

GEOPHYSICAL EQUIPMENT USED:

The airborne equipment, the INPUT MARK V E.M. system, is described in the accompanying Questor report. The ground equipment used on this project included the following instruments:

1 McPhar Model M700 magnetometer

1 Scintrex SE200 Electromagnetic vertical loop system

1 Scintrex SE600 Electromagnetic horizontal and vertical loop system.

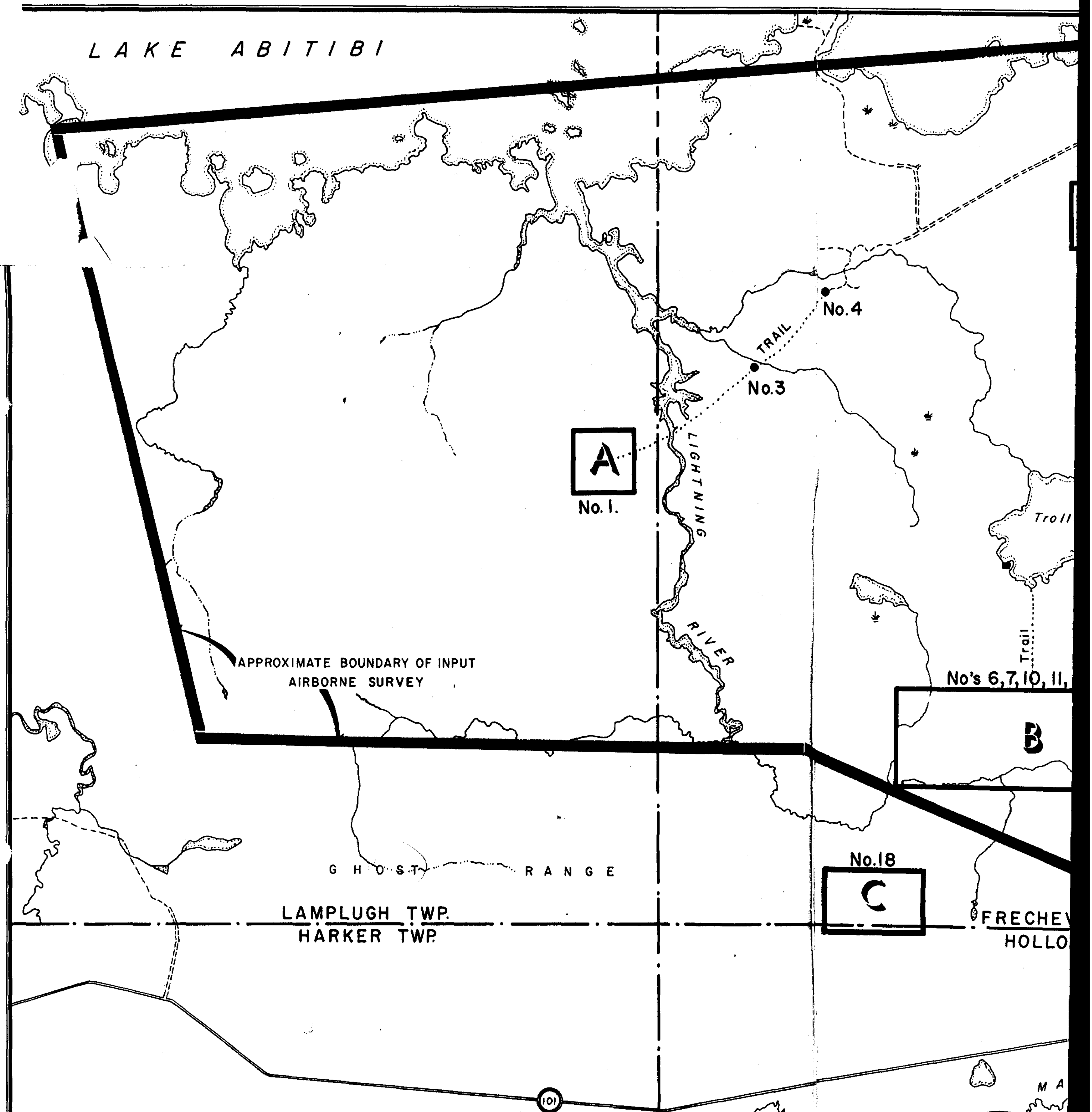
The M700 magnetometer is a vertical field magnetometer employing the fluxgate system. It is hand-held, self-levelling and relatively insensitive to orientation. An electronic adjustment permits measurement of vertical fields from plus 100,000 gammas to minus 100,000 gammas. Five scale ranges are available with a maximum sensitivity of 20 gammas per scale division on the 1,000 gamma range. Readability is 5 to 10 gammas.

The SE200 vertical loop E.M. employs a transmitter and a receiver coil in a two-man operation. The transmitter frequency is 1,200 hertz and maximum effective depth of exploration is 200 feet at a coil separation of 400 feet. Eddy currents are induced in the ground and are anomalously strong over a metallic body. The receiver picks up both the transmitter signal and the eddy current signal. These signals are compared in amplitude and phase in order to determine the source of the anomalous currents. The receiver coil is tilted to minimize, or 'null', an audible signal received on the earphone at successive stations. The tilt-angles are recorded and a curve is plotted from them. Where the tilt direction changes, the resultant 'cross-over' gives the location of a ground conductor axis. The null widths are indicative of the conductivity of the anomalous medium and are narrower over good conductors. Where the transmitter coil is held vertically the dip angles at the receiver coil are measured from the horizontal position. Various other coil configurations may be used depending on the survey requirements.

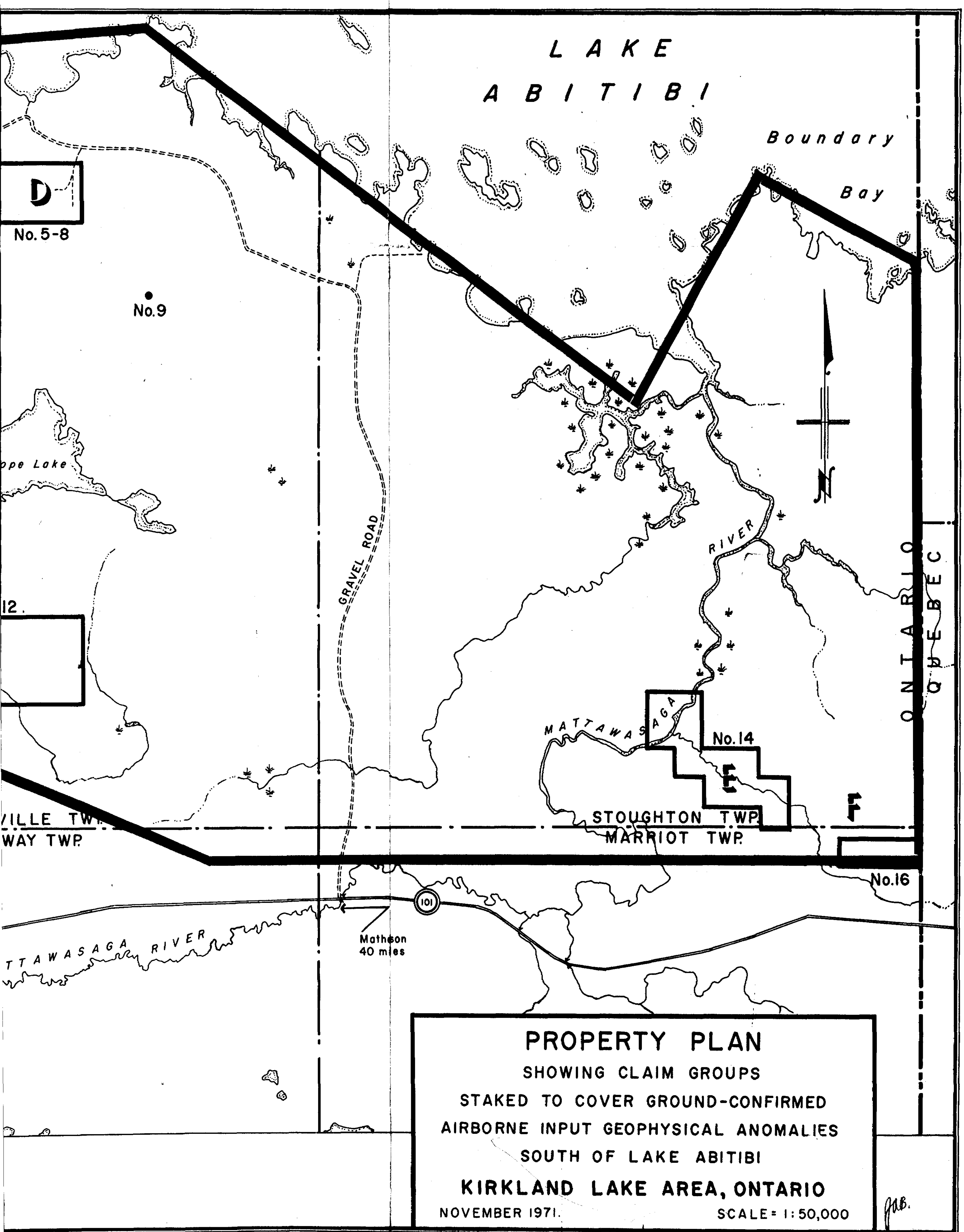
The SE600 horizontal and vertical loop EM system employs a transmitter and a receiver coil and in vertical coil configuration is quite similar in operation to the SE200. It transmits a stronger signal and uses a frequency of 1,600 hertz.

It is also designed as a moving-source E.M. unit capable of measuring In-Phase and Out-of-Phase signal components when the coils are connected by cable at separations of 200 or 300 feet. In-Phase and Out-of-Phase dials on the receiver coil are adjusted for the best null of the earphone signal. Dial readings may be positive or negative and are plotted as profiles to the same base.

A conductor will show an In-Phase curve of good amplitude and an In-Phase to Out-of-Phase amplitude ratio greater than 1:1.



GROUP	NUMBER OF CLAIMS	GROUP RECORD NUMBERS
A	4	296800-03
B	24	317904-23, 317998-318001
C	6	296810-15
D	6	296804-09
E	11	296792-99, 318440-42
F	3	318438-39, 318443



PROPERTY PLAN
SHOWING CLAIM GROUPS
STAKED TO COVER GROUND-CONFIRMED
AIRBORNE INPUT GEOPHYSICAL ANOMALIES
SOUTH OF LAKE ABITIBI
KIRKLAND LAKE AREA, ONTARIO
NOVEMBER 1971. SCALE = 1:50,000

SUMMARY OF DIAMOND DRILLING:

Hole Number	Anomaly Number	Co-Ordinates	Dip of Hole	FOOTAGE From	To	Advance	
71-1-1	1	1+30S 4+00W	-50oN	0 68	68 404	68 336	Overburden 228-257 Graphitic Tuff
71-(5-8)-1	5-8	2+75N 0+00	-50oS	0 18	18 310	18 292	Overburden 223-299 Graphitic Tuff
71-14-1	14	6+25S 8+25W	-50oS	0 156	156 281	156 125	Overburden 156-281 Graphitic Tuff
71-16-1	16	0+50N 8+00E	-50oS	0 115	115 260	115 145	Overburden 194-211 Graphitic Tuff
					Total	1,255	

The core from holes 71-1-1 and 71-(5-8)-1 is stored 200 feet south of the gravel road by the tractor road which leads to claim group D. The core from holes 71-14-1 and 71-16-1 is stored near the tractor road at 15+00S on line 8+00E approximately one mile north of Highway 101 on claim group E. Drill logs of the above four holes are included with this report.

In sum then, all accessible conductors were located and checked on the ground. The four apparently bedrock conductors were drill-tested. Conductive bedrock material was intersected in each case and provided a satisfactory explanation for the anomaly.

J. A. Boyd

MAPS AND SECTIONS:

The following maps and sections are included with this report:

Scale 1:50,000

Kirkland Lake Area - S. Lake Abitibi Property Plan
S. Lake Abitibi - Drill Access Sketch.

Scale 1 inch= 400 feet
No. 18 Conductor - Composite Plan.

Scale 1 inch= 200 feet

Claim Group A (No.1)	- Property Plan showing topography and geology - V.L.E.M. Survey - H.L.E.M. Survey - Magnetometer Survey
No. 3 Conductor	- V.L.E.M. Survey - Magnetometer Survey
No. 4 Conductor	- V.L.E.M. Survey
Claim Group D. (No. 5-8)	- Property Plan showing topography and geology - V.L.E.M. survey - H.L.E.M. survey - Magnetometer survey
Claim Group E (No. 14)	- Property Plan showing topography and geology - V.L.E.M. Survey - H.L.E.M. Survey - Magnetometer Survey
Claim Group F (No. 16)	- Property Plan showing topography and geology - V.L.E.M. Survey - H.L.E.M. Survey - Magnetometer Survey

Scale 1 inch= 40 feet

4 Diamond Drill Sections - Groups A,D,E and F.

REFERENCES:

Assessment Work Library files

1971: Ontario Department of Mines and Northern Affairs, Toronto, Ontario.

Geological Map P.120, Ontario Department of Mines

1972: Munro - Pontiac Sheet, 1"= 1 Mi.

Geological Map P. 140, Ontario Department of Mines

1962: Iroquois Falls - Lake Abitibi Sheet, 1"= 2 Mi.

Geological Map 2046, Ontario Department of Mines

1964: Timmins - Kirkland Lake Sheet, 1"=4 Mi.

Topographic Map 32 D/12 W, Canada Department of Mines

1966: Lightning River West Sheet, 1:50,000

Topographic Map 32 D/12 E, Canada Department of Mines

1966: Lightning River East Sheet, 1:50,000

TSL

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TELEX: 0229302
CABLE ADDRESS – TECSERV TORONTO

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Patino Mining Corporation
1401 - 7 King Street East
Toronto, Ontario
Attn J.A. Boyd

REPORT NO.
M-0026

SAMPLE(S) OF ROCK - Anomoly #18 - Peridotite

Spectrographic Estimates:

	Sample	Sample	Sample		Sample	Sample	Sample
Antimony	–			Lithium (Li_2O)	–		
Arsenic	–			Manganese	.1%		
Barium	.05%			Mercury	–		
Beryllium (BeO)	–			Molybdenum	.001%		
Bismuth	–			Nickel	.1%		
Cadmium	–			Silver	<.1oz/t		
Cerium (CeO_2)	–			Tantalum (Ta_2O_5)	–		
Chromium	.2%			Thorium (ThO_2)	–		
Cobalt	.005%			Tin	–		
Columbium (Cb_2O_5)	–			Titanium	.1%		
Copper	.005%			Tungsten	–		
Gallium	–			Uranium (U_3O_8)	–		
Germanium	–			Vanadium	.01%		
Indium	–			Zinc	–		
Iron	3%			Zirconium (ZrO_2)	–		
Lead	–						

Figures are approximate:

CODE

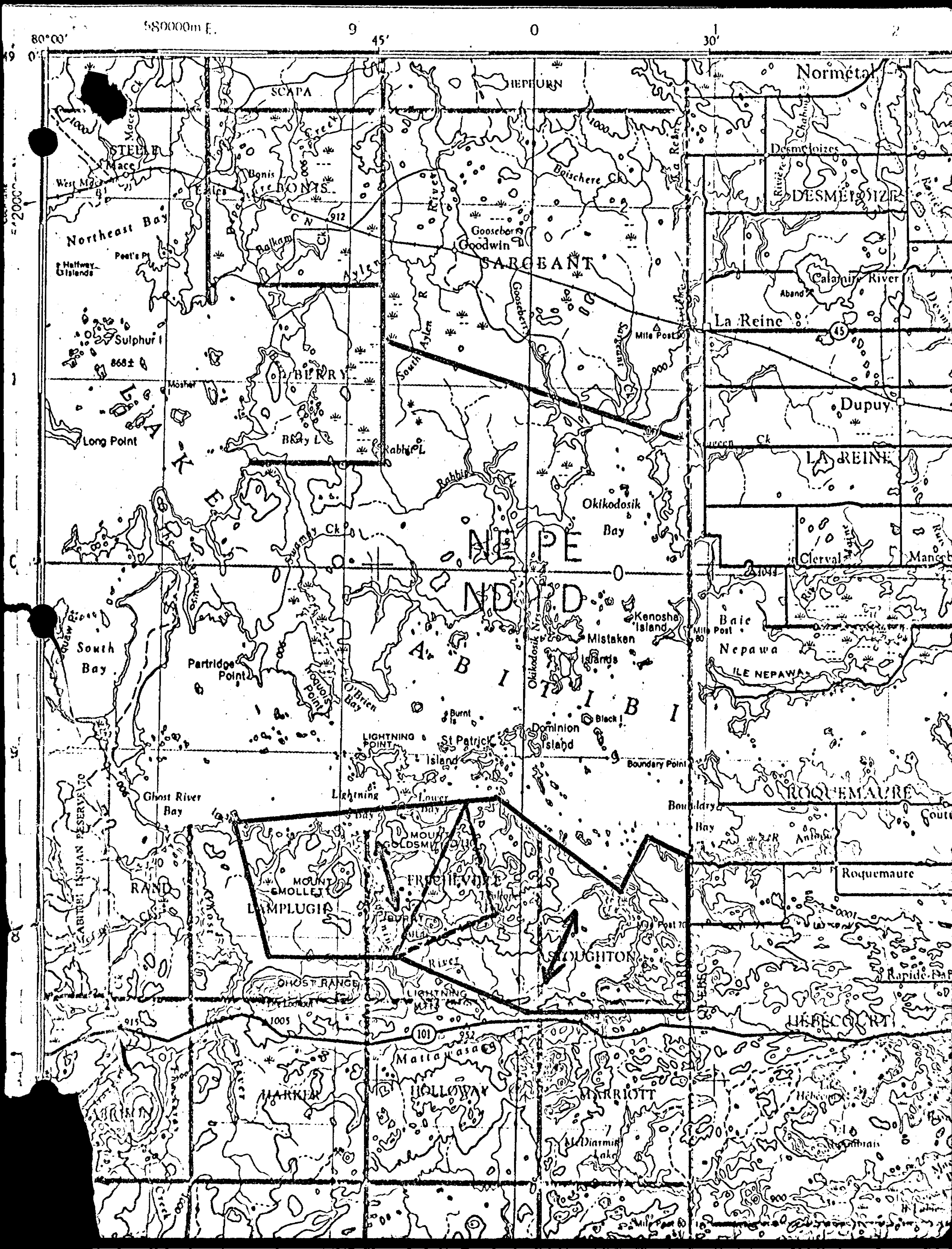
H : High	10- 100%	L : Low	0.1 - 1%	PT : Possible Trace, presence not certain.
MH : Medium High	5 - 50%	TL : Trace Low	0.05 - 0.5%	— : Not Detected, elements looked for but not found.
M : Medium	1 - 10%	T : Trace	0.01 - 0.1%	< : Less than........................
LM : Low Medium	0.5 - 5%	FT : Faint Trace	less than 0.01%	> : More than........................

Samples, Pulps and Rejects discarded after two months

DATE Nov 17/71 SIGNED [signature]

CTA

WESTERN CANADA — 325 HOWE ST., VANCOUVER 1, B.C.

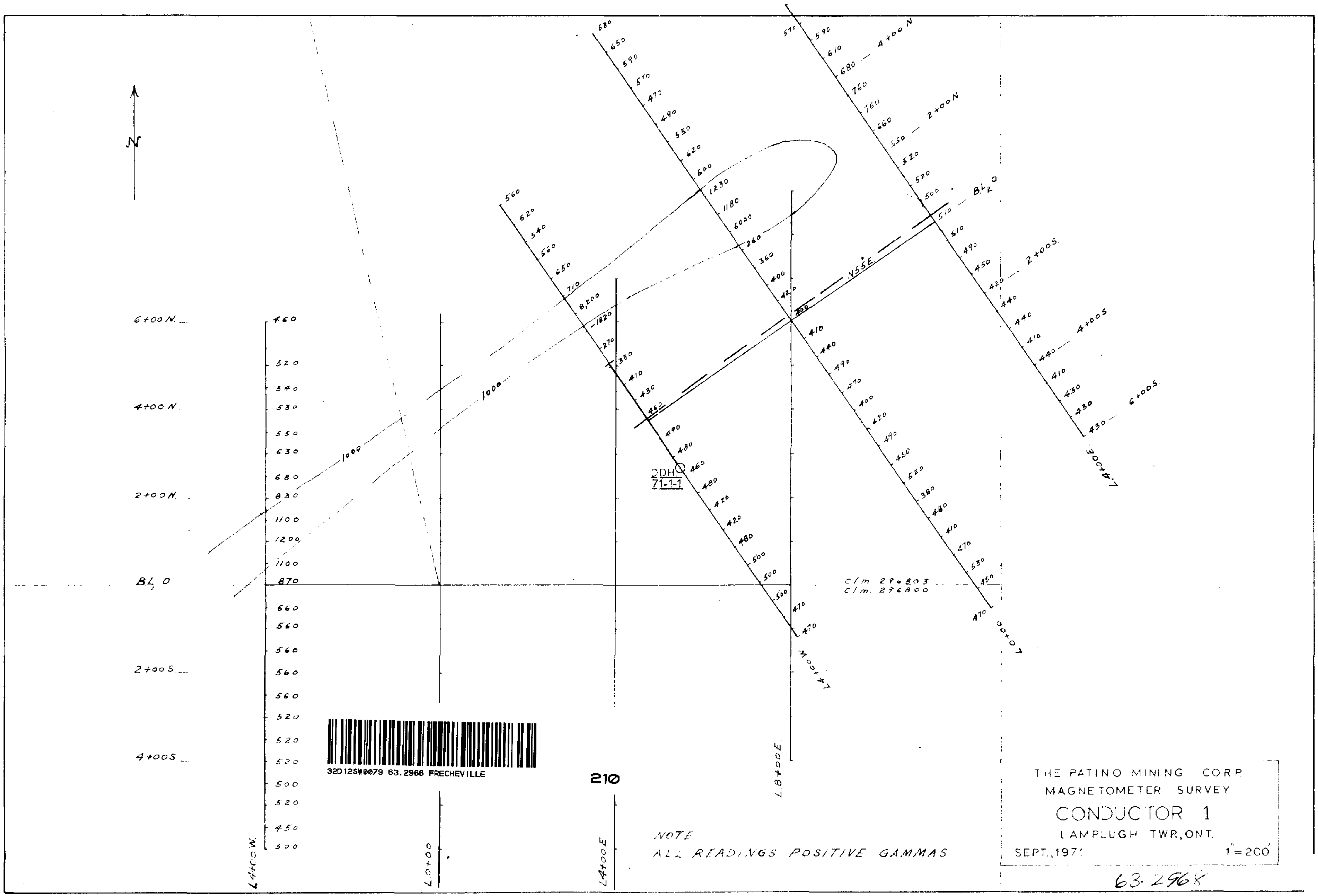


580000m E.
80°00'
45'
30'
Normétal
SCAPA
HEPBURN
STEELE
Mace
BONIS
Northeast Bay
Halfway Islands
Sulphur I
BERRY
Mosher
LAKE
Long Point
Berry L
Rabbit L
Goodwin
SARGEANT
South Aylen R
Boischere Ck
DESMELOIZE
Desmeloizes
Calamine River
La Reine
Mile Post
Dupuy
LA REINE
Okikodosik Bay
Swampy Ck
NEPE ND I D
ABITIBI
Clerval
Kenosha Island
Mistaken Islands
Baie Nepawa
ILE NEPAWA
South Bay
Partridge Point
Iroquois Point
O'Brien Bay
Okikodosik Nrs
Burnt Is
Black I
Dominion Island
LIGHTNING POINT
St Patrick Island
Boundary Point
ROQUEMAURE
Roquemaure
Ghost River Bay
ABITIBI INDIAN RESERVE 70
RAND
MOUNT SMOLLETT
LAMPLUGH
MOUNT GOLDSMITH
Boundary Bay
STOUGHTON
GHOST RANGE
LIGHTNING
101
HEBECOURT
Mattawasaga
MARKER
HOLLOWAY
MARRIOTT
McDiarmid Lake

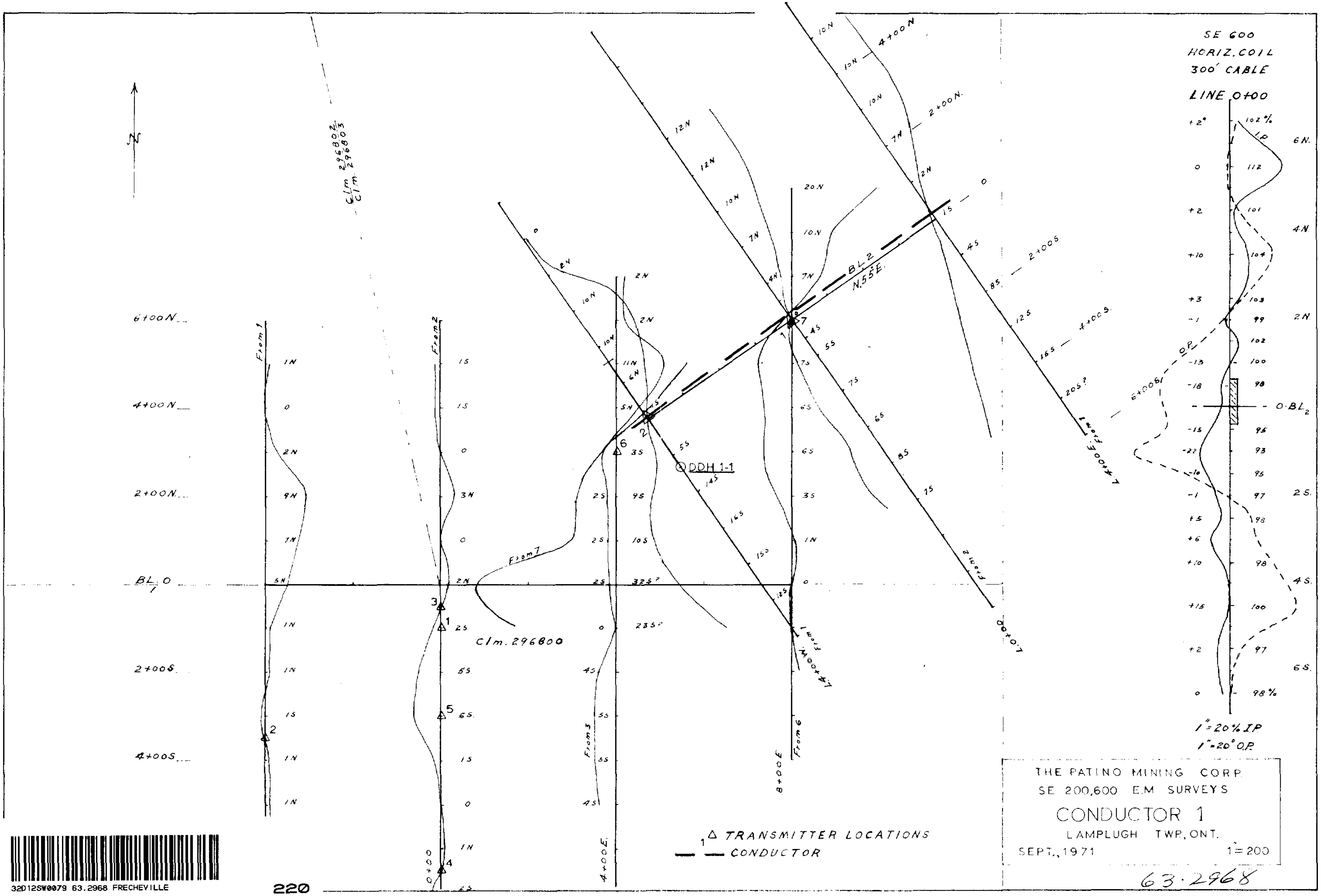
32D12SW0079 63.2968 FRECHEVILLE

200

63.2968



N
6+00N
4+00N
2+00N
BL1 0
2+00S
4+00S
L4+00W
L0+00
L4+00E
L8+00E
L4+00W
L0+00
L4+00E
4+00N
2+00N
BL2 0
2+00S
4+00S
6+00S
N55E
DDH 71-1-1
1000
C/m 296803
C/m 296800
460
520
540
530
550
630
680
830
1100
1200
1100
870
660
560
560
560
560
520
520
520
500
520
450
500
NOTE
ALL READINGS POSITIVE GAMMAS
THE PATINO MINING CORP.
MAGNETOMETER SURVEY
CONDUCTOR 1
LAMPLUGH TWP, ONT.
SEPT., 1971
1" = 200'
63.2968
32D12SW0079 63.2968 FRECHEVILLE
210



N
Clm. 296802/3
Clm. 296803
Clm. 296800
6+00N
4+00N
2+00N
BL 0
2+00S
4+00S
From 1
From 2
From 3
From 6
From 7
0+00
4+00E
8+00E
L 4+00W
L 0+00
L 4+00E
2+00N.
4+00N
2+00S
4+00S.
6+00S
BL 2
N.55°E.
DDH 1-1
SE 600
HORIZ. COIL
300' CABLE
LINE 0+00
I.P.
O.P.
0·BL2
1"=20% I.P
1"=20° O.P.
Δ TRANSMITTER LOCATIONS
— — CONDUCTOR
THE PATINO MINING CORP.
SE 200,600 E.M. SURVEYS
CONDUCTOR 1
LAMPLUGH TWP, ONT.
SEPT., 1971
1"=200'
63·2968

THE PATINO MINING CORP.

ABITIBI PROJECT

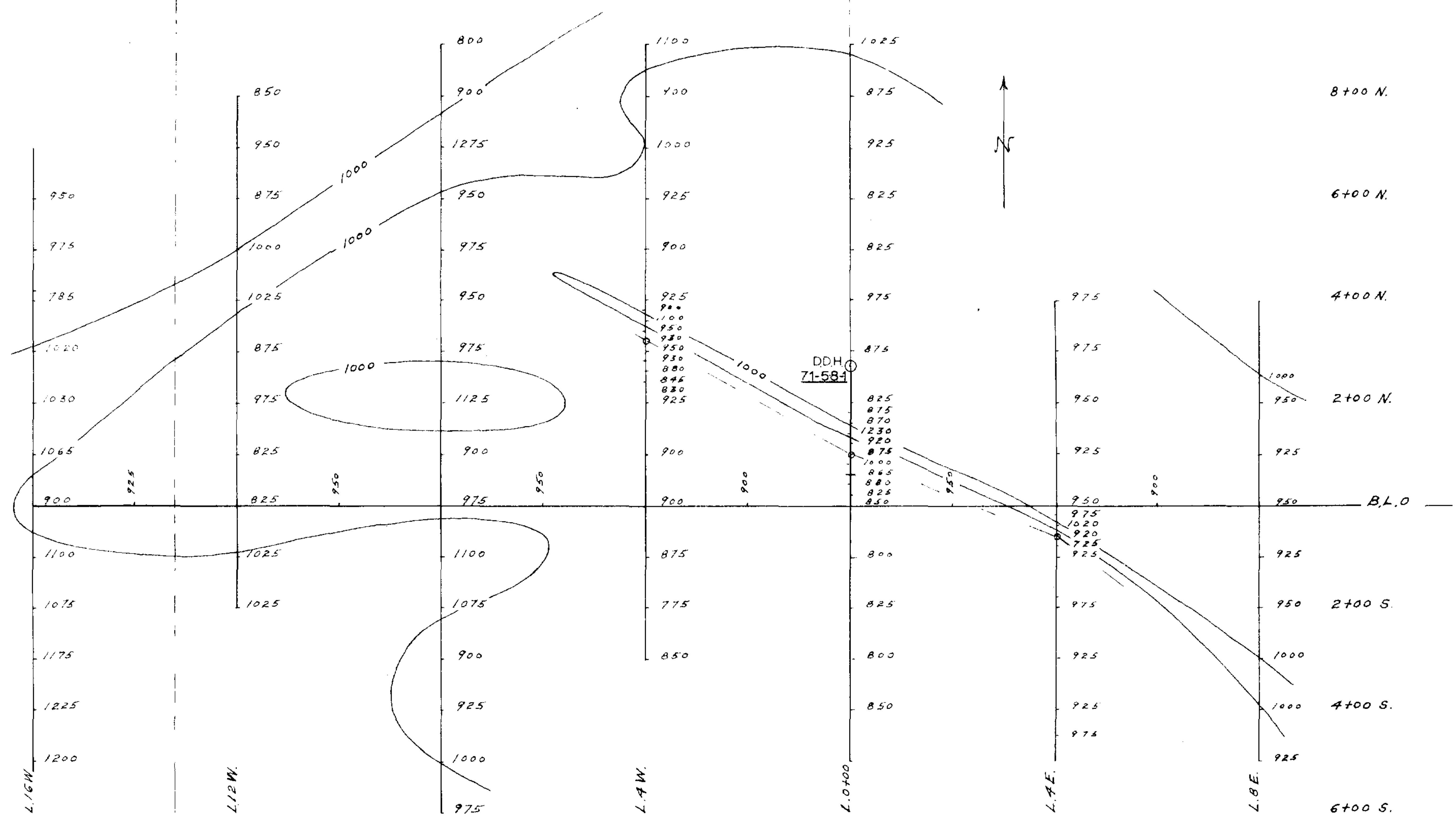
FRECHEVILLE TOWNSHIP, ONTARIO

CONDUCTOR NO. 5-8

PROPERTY PLAN SHOWING

GEOLOGY & CLAIMS

NOVEMBER, 1971 SCALE 1"=200'

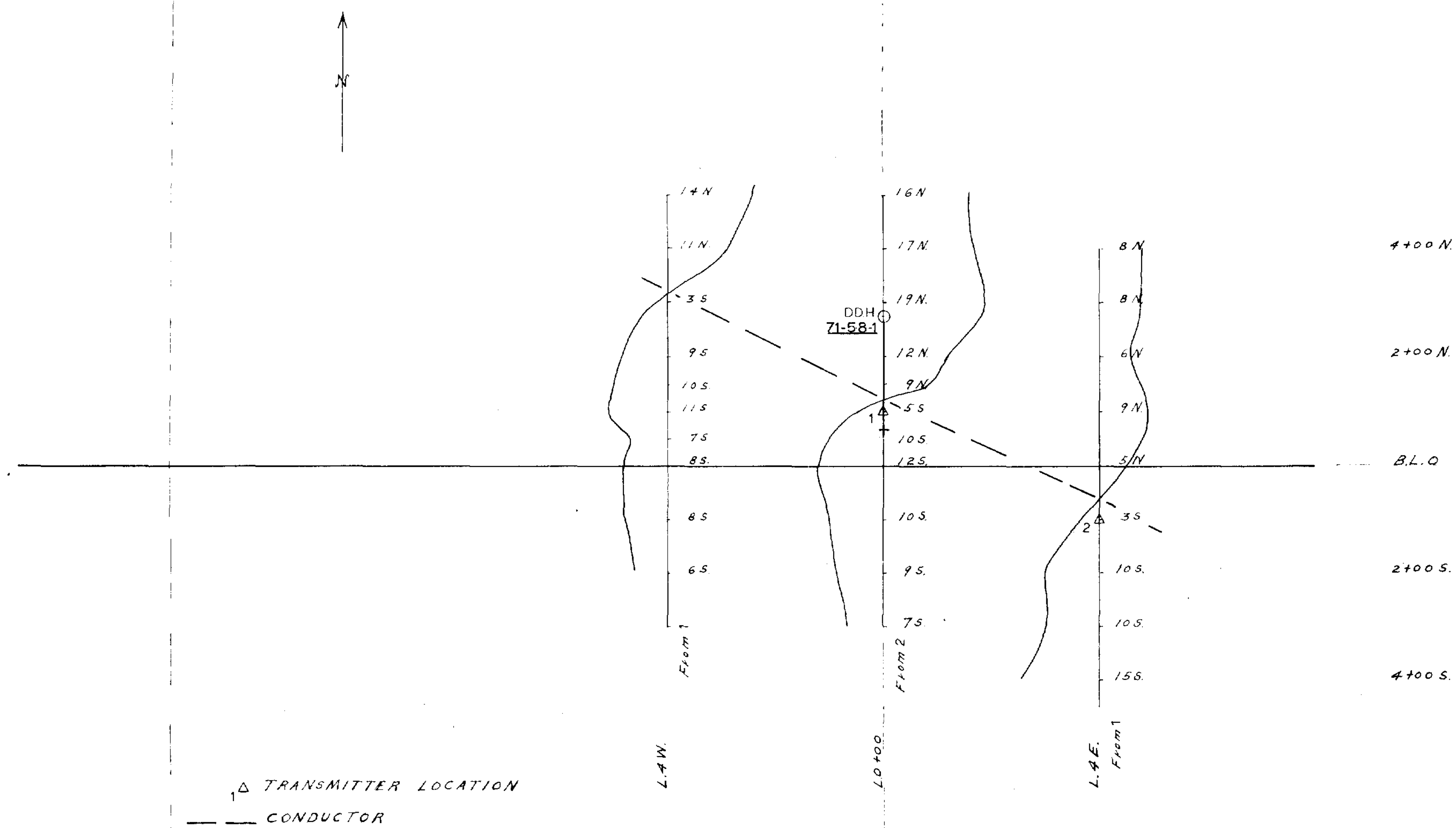


NOTE:
ALL READINGS POSITIVE GAMMAS

THE PATINO MINING CORP.
MAGNETOMETER SURVEYS
CONDUCTOR 58
FRECHEVILLE TWP., ONT
SEPT., 1971 1"= 20…

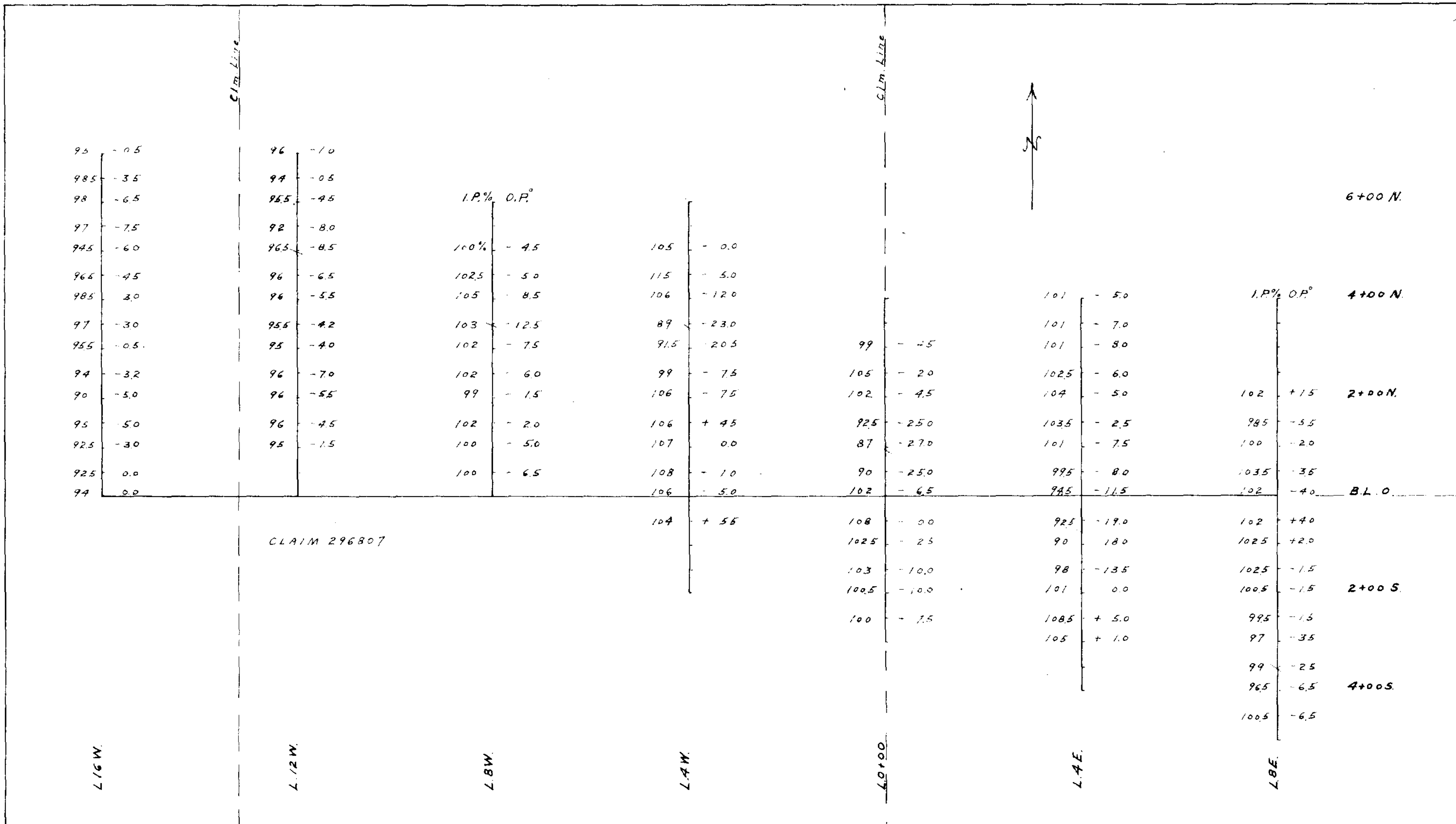
32D12SW0079 63.2968 FRECHEVILLE

240



THE PATINO MINING CORP.
SE 200 V.L.E.M. SURVEY
CONDUCTOR 5-8
FRECHEVILLE TWP., ONT.
SEPT., 1971 1"=200'

63.2968



COIL SEPARATION 200 FT.

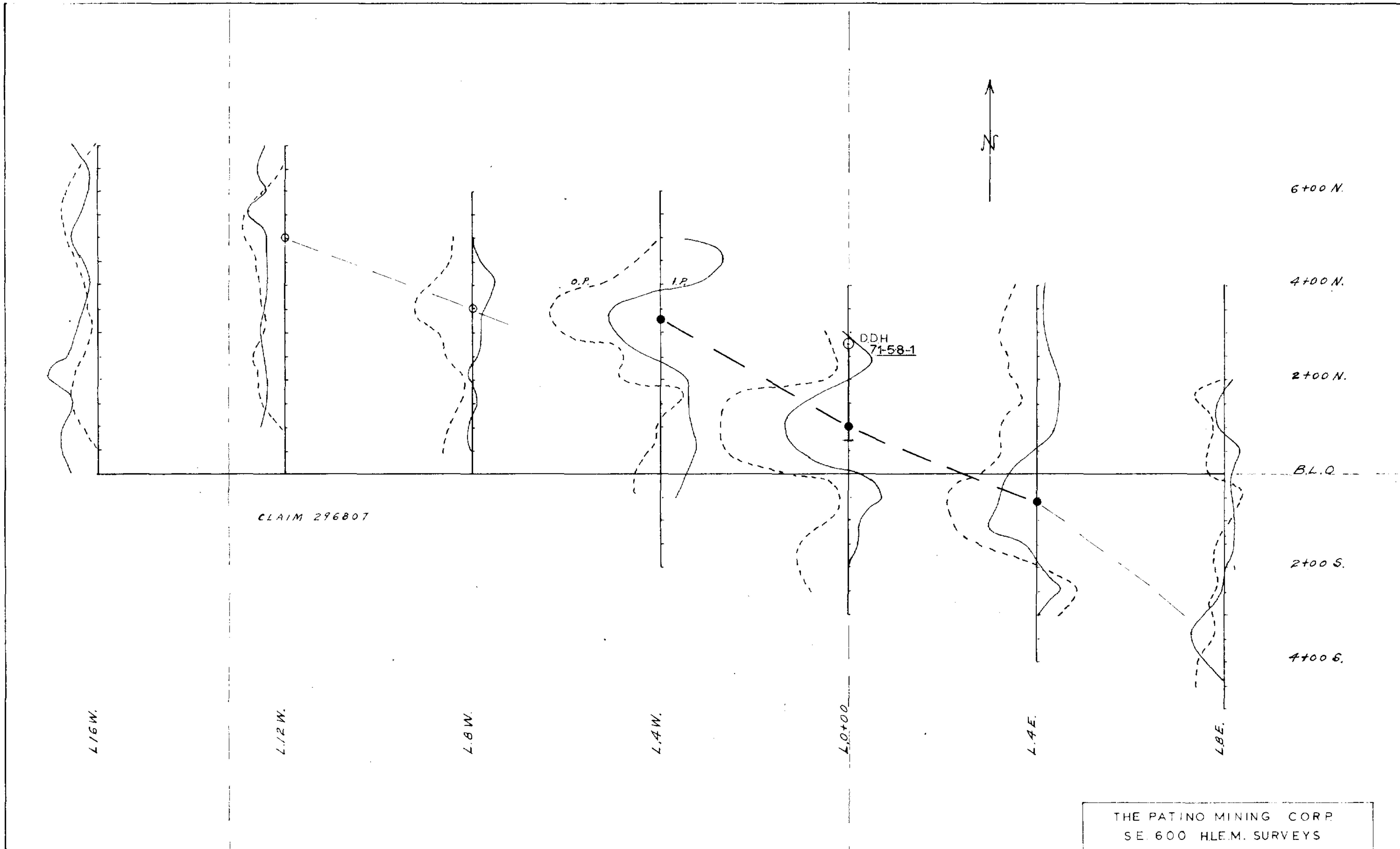
THE PATINO MINING CORP
SE 600 E.M. SURVEY

CONDUCTOR 5-8

FRECHEVILLE TWP., ONT.

SEPT., 1971 1" = 200'

63. 2968



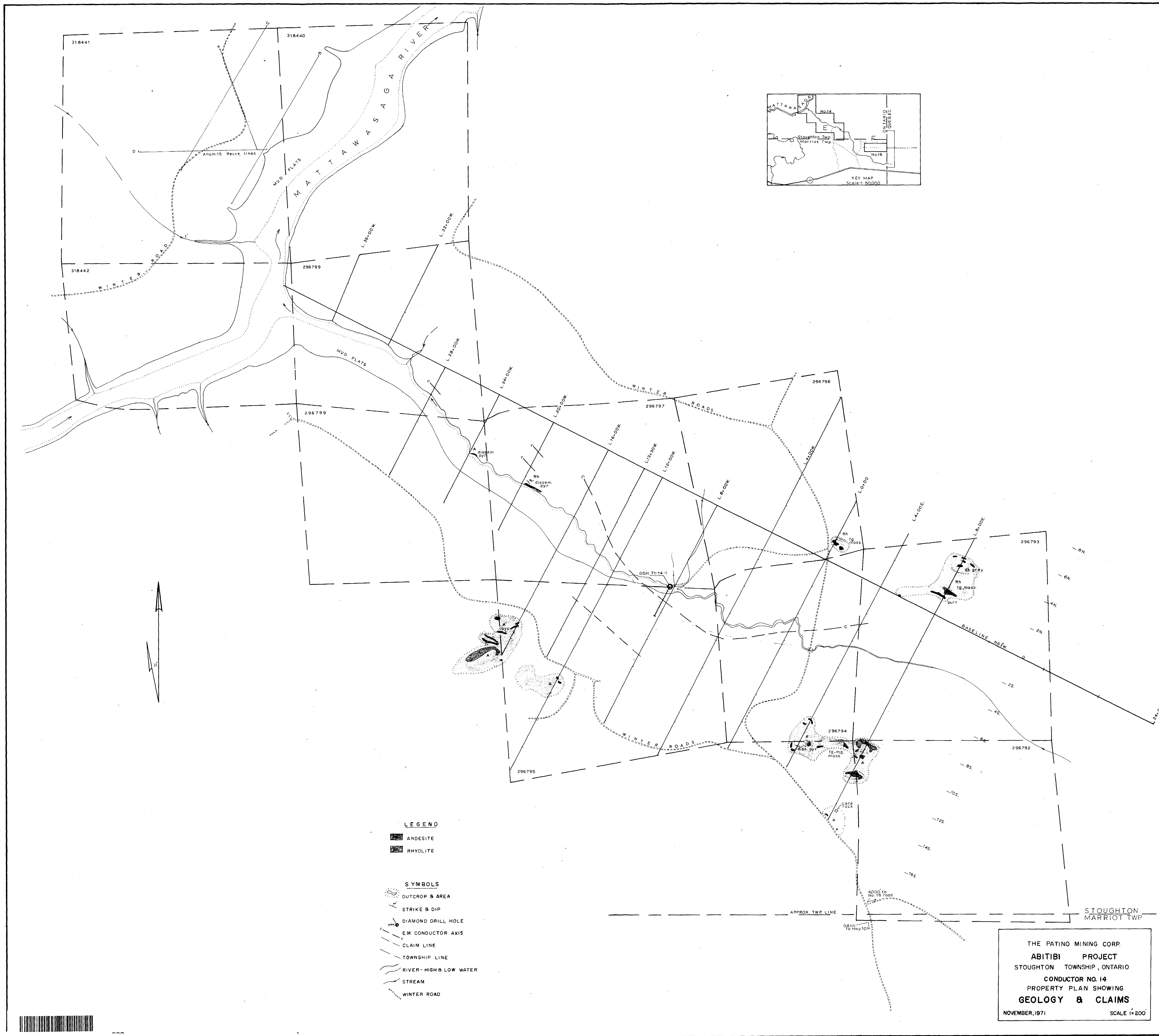
PROFILE SCALE: 1" = 20% IN-PHASE — I.P.
1" = 20° OUT-OF-PHASE — O.P.

THE PATINO MINING CORP.
S.E. 600 H.L.E.M. SURVEYS
CONDUCTOR 5-8
FRECHEVILLE TWP., ONT.
SEPT., 1971 1" = 200'

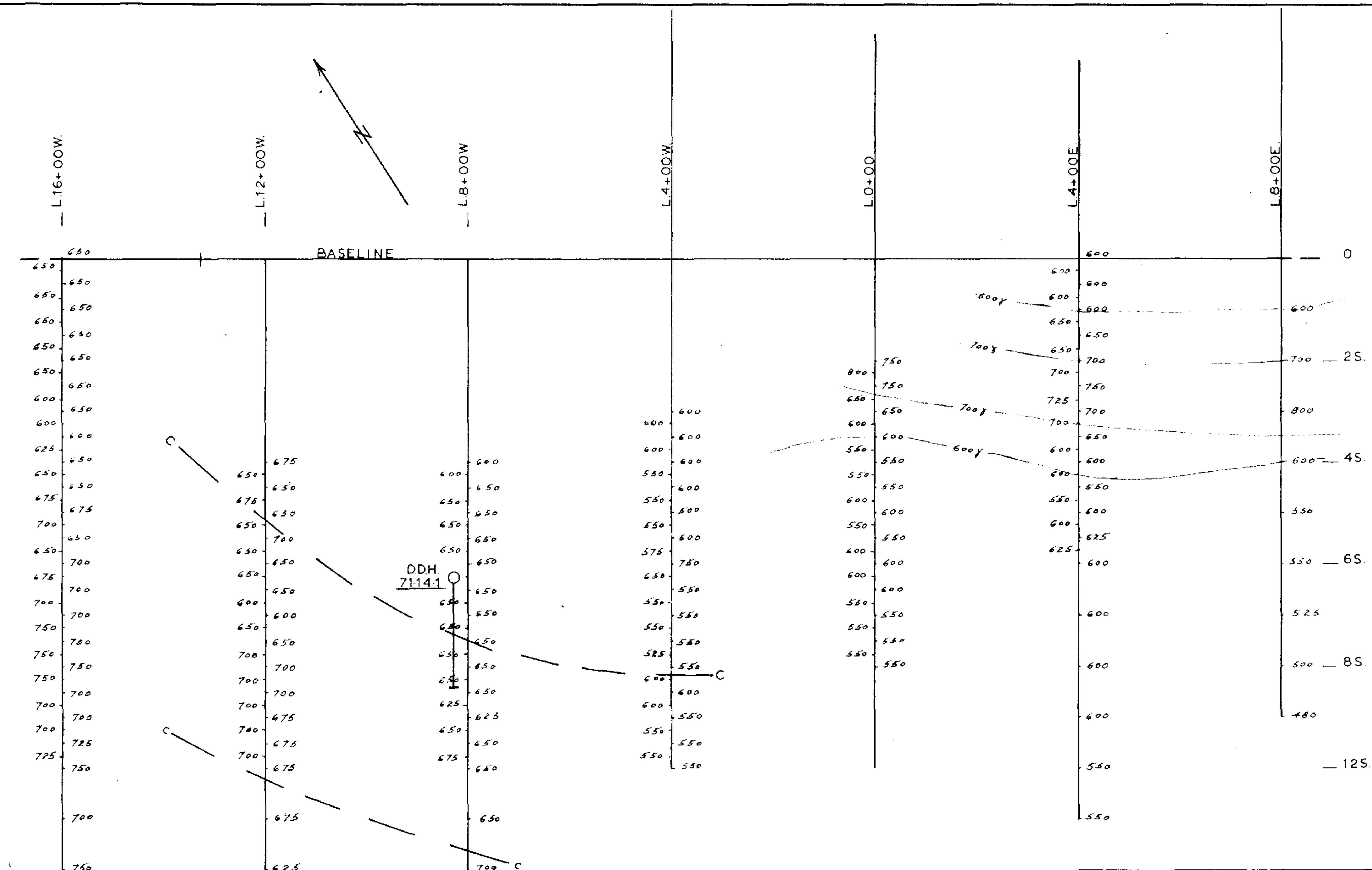
63.2968

32D12SW0079 63.2968 FRECHEVILLE

270



318441
318440
318442
296799
296797
296796
296793
296794
296792
296795
MATTAWASAGA RIVER
MUD FLATS
WINTER ROAD
WINTER ROADS
Anom.15 Recce lines
KEY MAP
Scale 1: 50,000
ONTARIO
QUEBEC
No.14
No.16
Stoughton Twp
Marriot Twp
L.36+00W.
L.32+00W.
L.28+00W.
L.24+00W.
L.20+00W.
L.16+00W.
L.13+30W.
L.12+00W.
L.8+00W.
L.4+00W.
L.0+00
L.4+00E.
L.8+00E.
24+00E.
BASELINE N63W.
DDH 71-14-1
dissem. pyr.
Rh dissem. pyr.
Rh fg. mass
dk. grey
Rh fg. mass
buff
diss. pyr.
fg. mg. mass
core rock
4000' to No. 16 road
0.8 Mi. to Hwy. 101
APPROX. TWP. LINE
STOUGHTON
MARRIOT TWP.
LEGEND
ANDESITE
RHYOLITE
SYMBOLS
OUTCROP & AREA
STRIKE & DIP
DIAMOND DRILL HOLE
E.M. CONDUCTOR AXIS
CLAIM LINE
TOWNSHIP LINE
RIVER - HIGH & LOW WATER
STREAM
WINTER ROAD
THE PATINO MINING CORP.
ABITIBI PROJECT
STOUGHTON TOWNSHIP, ONTARIO
CONDUCTOR NO. 14
PROPERTY PLAN SHOWING
GEOLOGY & CLAIMS
NOVEMBER, 1971
SCALE 1" = 200'



ALL READINGS-POSITIVE GAMMAS

CONDUCTOR AXIS C—— ——C

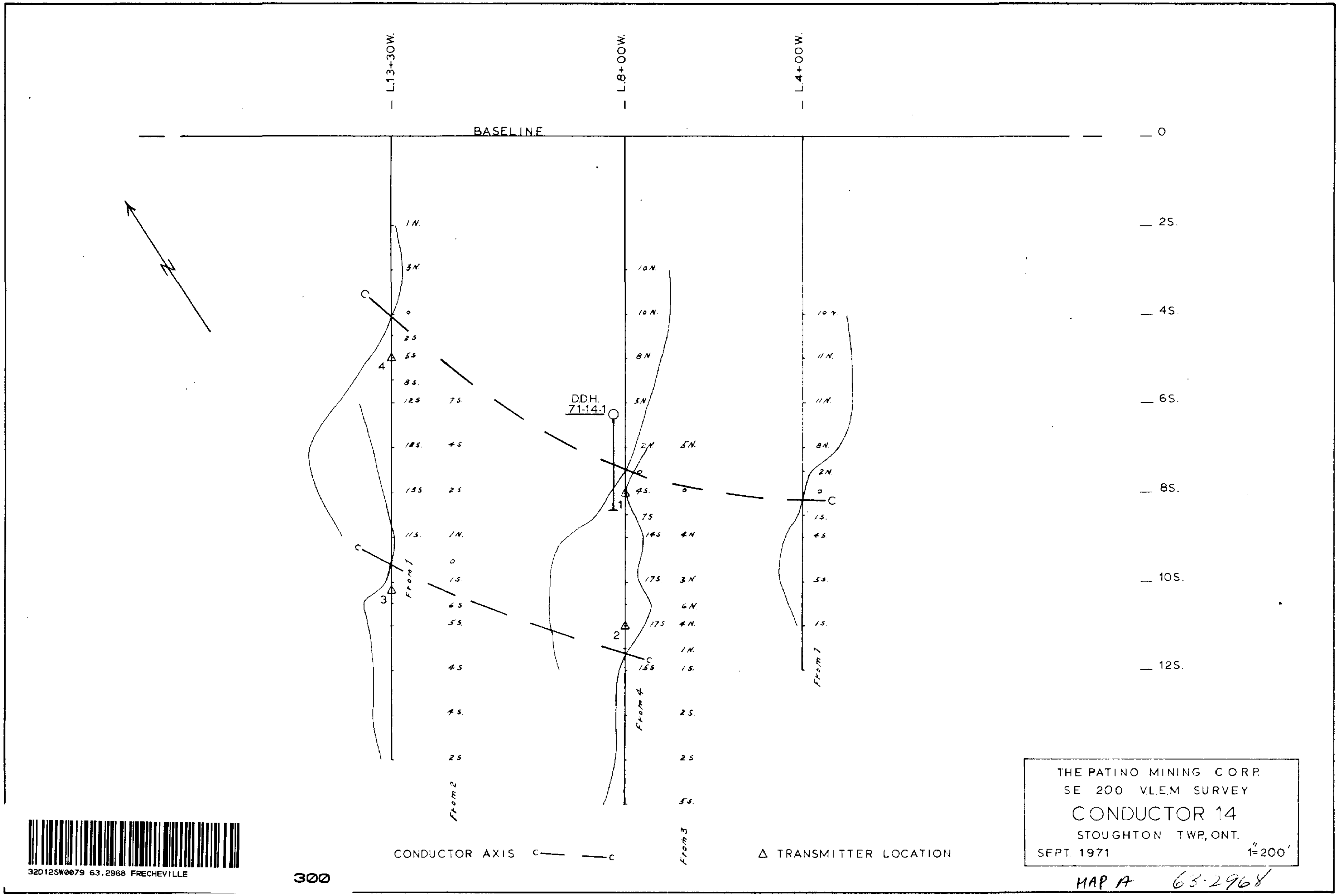
THE PATINO MINING CORP.
MAGNETOMETER SURVEY

CONDUCTOR 14

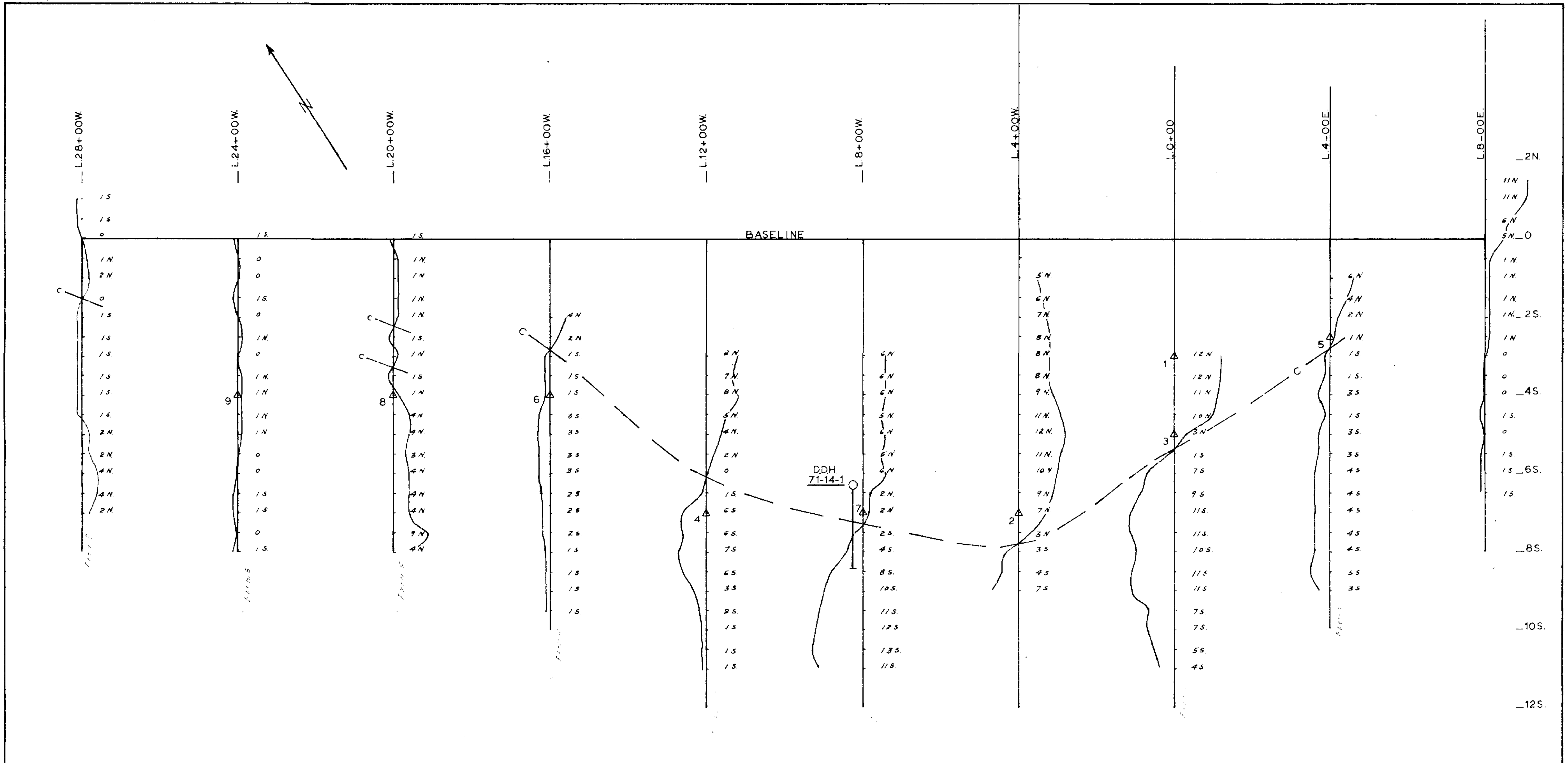
STOUGHTON TWP., ONT.

SEPT., 1971 1"=200'

63·2968


L.13+30W.
L.8+00W.
L.4+00W.
BASELINE
0
2S.
4S.
6S.
8S.
10S.
12S.
DDH.
71-14-1
From 1
From 2
From 3
From 4
CONDUCTOR AXIS C—— ——C
△ TRANSMITTER LOCATION
THE PATINO MINING CORP.
SE 200 V.L.E.M. SURVEY
CONDUCTOR 14
STOUGHTON TWP, ONT.
SEPT. 1971
1"=200'
MAP A 63·2968

300

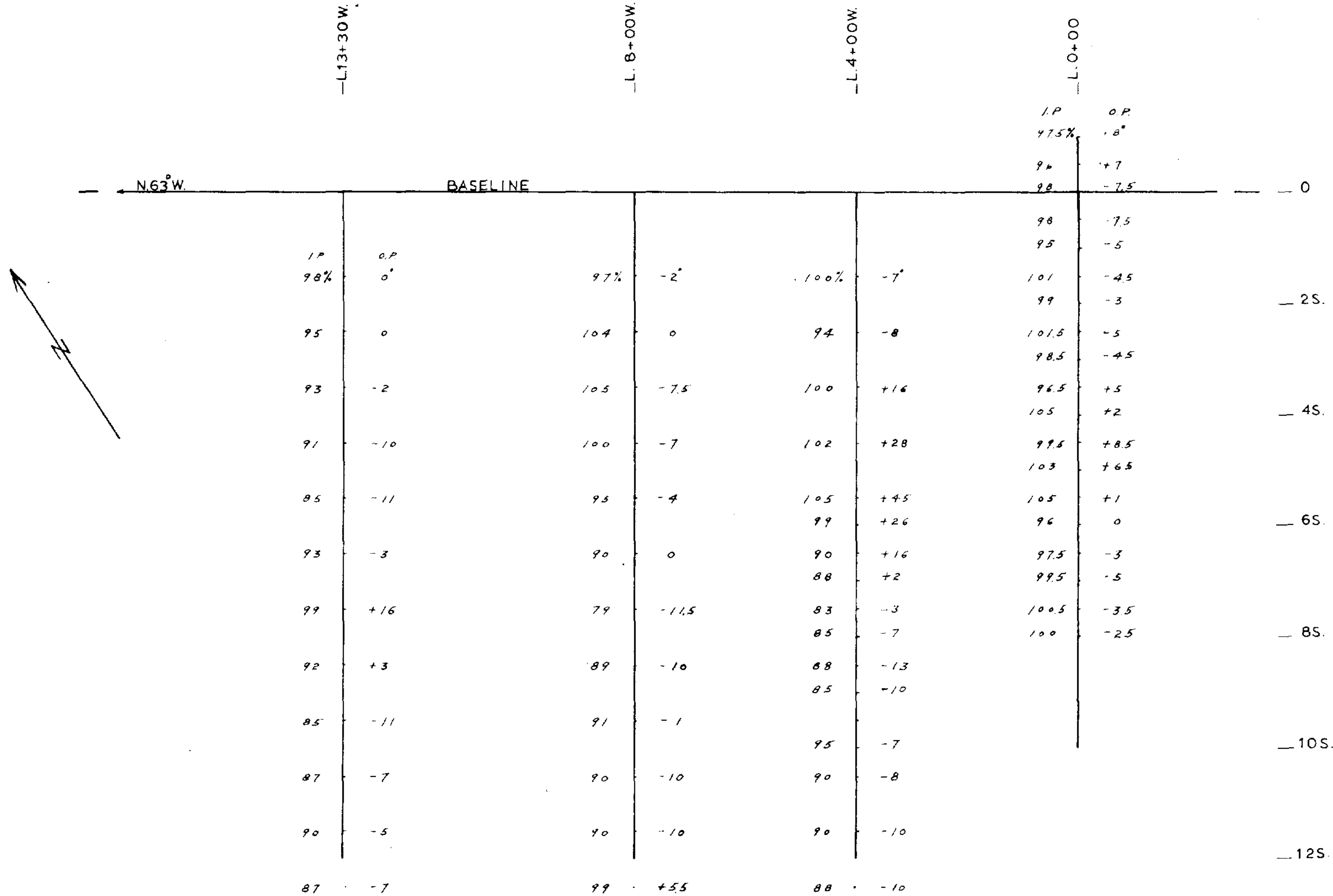


CONDUCTOR AXIS C— —C

1△ TRANSMITTER LOCATION

THE PATINO MINING CORP.
SE 200 VLEM SURVEY
CONDUCTOR 14
STOUGHTON TWP., ONT.
SEPT., 1971 1"=200'

MAP B 63.2968



COIL SEPARATION 300'

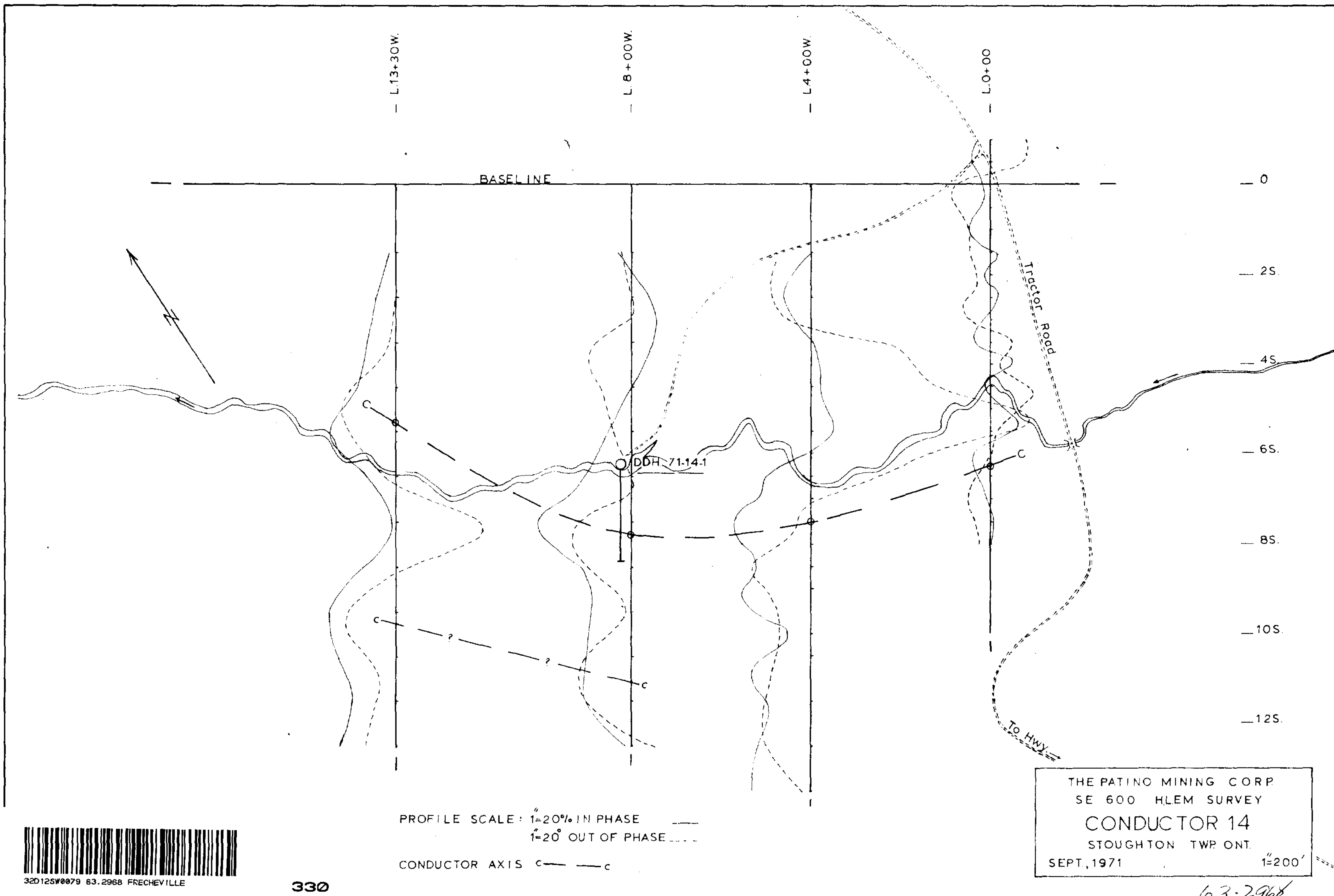
THE PATINO MINING CORP.
SE 600 HLEM SURVEY

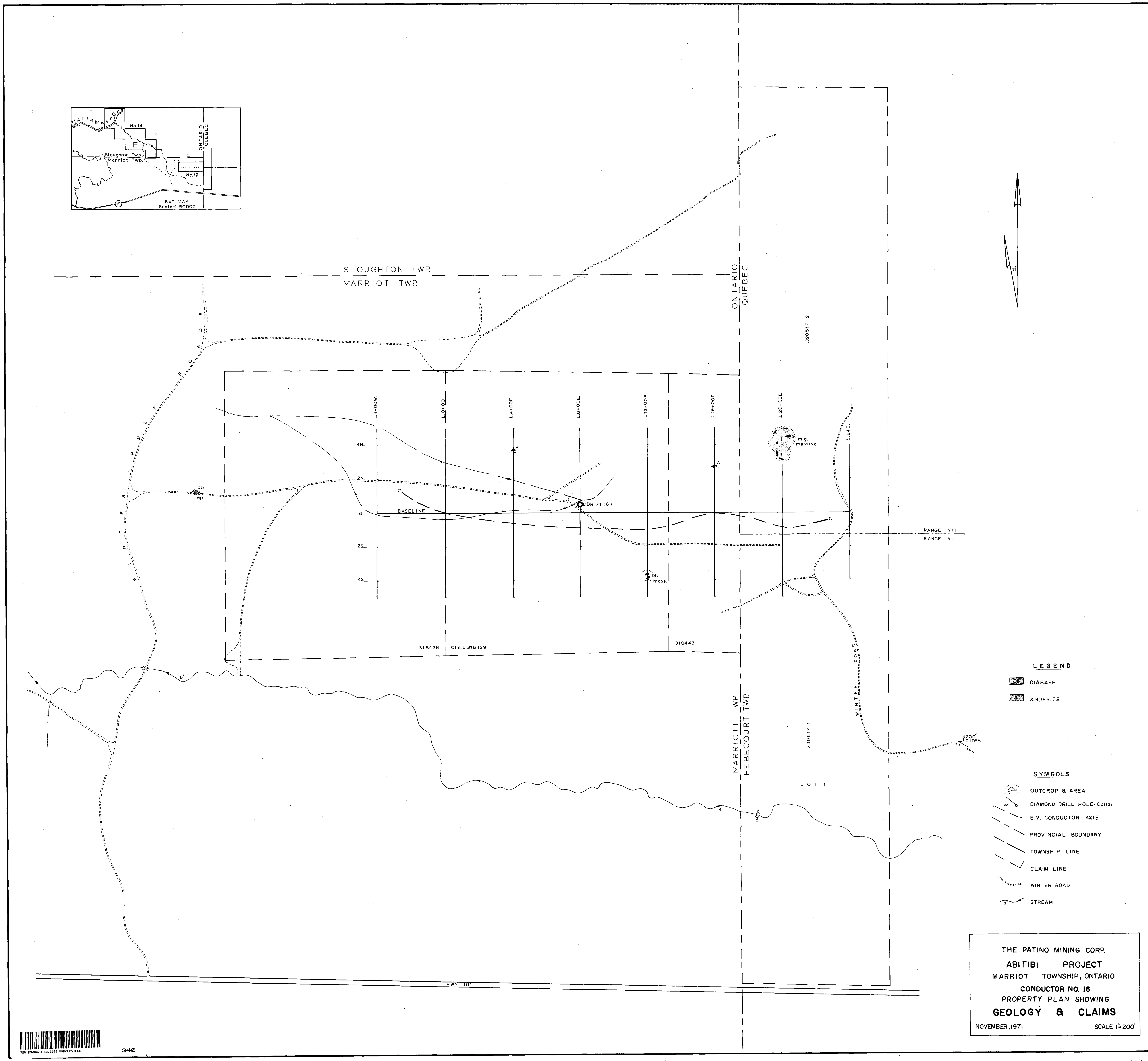
CONDUCTOR 14

STOUGHTON TWP., ONT.

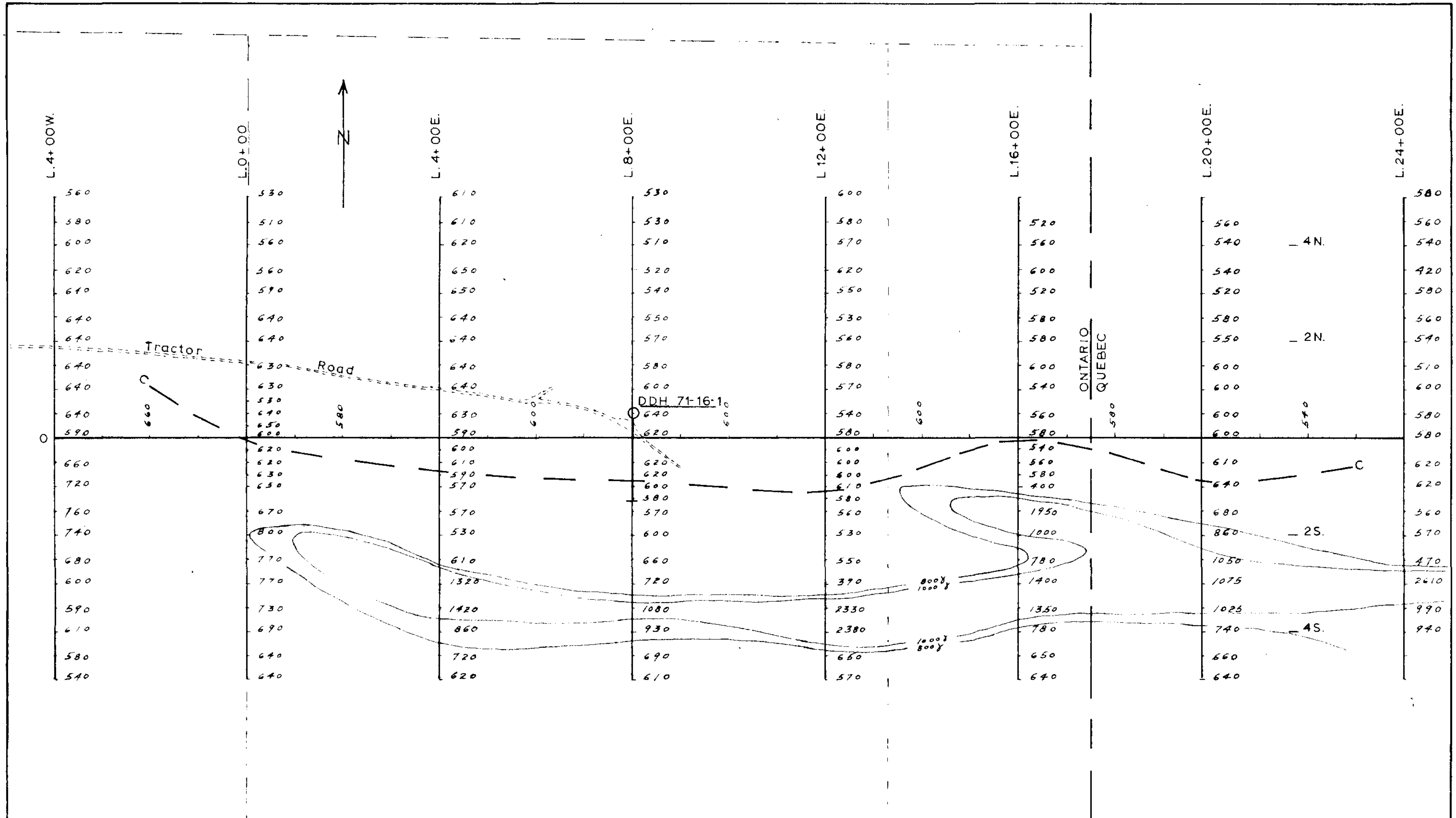
SEPT., 1971 1"=200'

63·2968


L.13+30W.
L.8+00W.
L.4+00W.
L.0+00
BASELINE
0
2S.
4S.
6S.
8S.
10S.
12S.
Tractor Road
To Hwy.
DDH. 71-14-1
PROFILE SCALE: 1"=20% IN PHASE
1"=20° OUT OF PHASE
CONDUCTOR AXIS c— —c
THE PATINO MINING CORP.
SE 600 H.L.E.M. SURVEY
CONDUCTOR 14
STOUGHTON TWP. ONT.
SEPT., 1971
1"=200'
63.2968
330
32D12SW0079 63.2968 FRECHEVILLE



MATTAWASAGA
No.14
E
F
ONTARIO
QUEBEC
Stoughton Twp.
Marriot Twp.
No.16
KEY MAP
Scale-1:50000
STOUGHTON TWP.
MARRIOT TWP.
ONTARIO
QUEBEC
WINTER PULP ROADS
320517-2
L.4+00W.
L.0+00
L.4+00E.
L.8+00E.
L.12+00E.
L.16+00E.
L.20+00E.
L.24E.
4N
2N
0
2S
4S
BASELINE
DDH 71-16-1
m.g.
massive
Db
cp.
Db
mass.
RANGE VIII
RANGE VII
318438
Clm.L.318439
318443
MARRIOTT TWP.
HEBECOURT TWP.
320517-1
LOT 1
WINTER ROAD
4200' to Hwy.
HWY. 101
LEGEND
DIABASE
ANDESITE
SYMBOLS
OUTCROP & AREA
DIAMOND DRILL HOLE-Collar
E.M. CONDUCTOR AXIS
PROVINCIAL BOUNDARY
TOWNSHIP LINE
CLAIM LINE
WINTER ROAD
STREAM
THE PATINO MINING CORP.
ABITIBI PROJECT
MARRIOT TOWNSHIP, ONTARIO
CONDUCTOR NO. 16
PROPERTY PLAN SHOWING
GEOLOGY & CLAIMS
NOVEMBER, 1971
SCALE 1"=200'
340

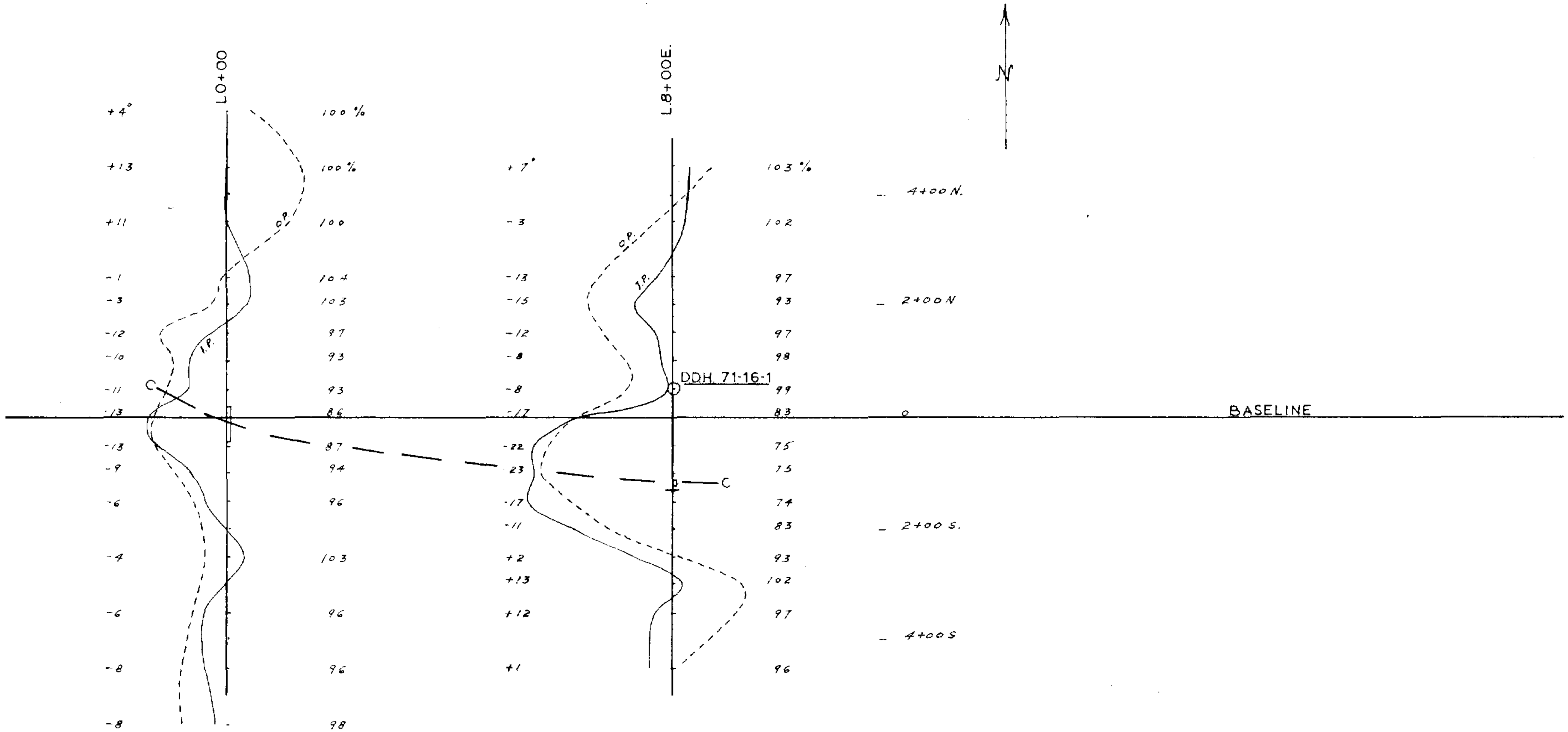


THE PATINO MINING CORP.
MAGNETOMETER SURVEY
CONDUCTOR 16
MARRIOT TWP., ONT.
SEPT., 1971
1"=200'

63·2968

32D12SW0079 63.2968 FRECHEVILLE

350

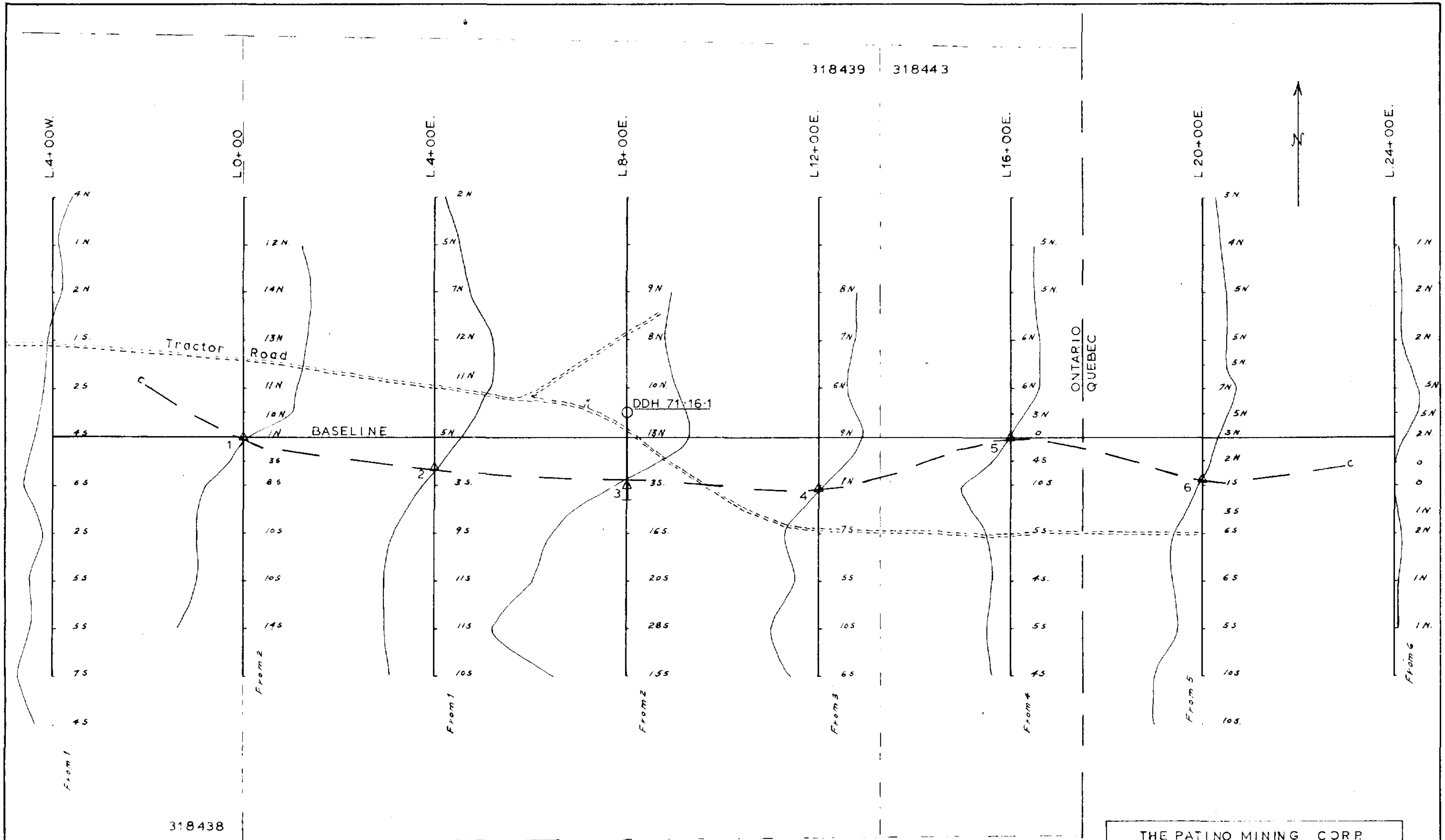


PROFILE SCALE : 1" = 20% IN-PHASE — I.P.
1" = 20° OUT-OF-PHASE — O.P.

COIL SEPARATION 300'
C——C CONDUCTOR

THE PATINO MINING CORP.
SE 600 HLEM SURVEY
CONDUCTOR 16
MARRIOT TWP, ONT.
SEPT. 1971 1" = 200'

63.2968



1 △ TRANSMITTER LOCATIONS

c —— CONDUCTOR

THE PATINO MINING CORP.
SE 600 VLEM. SURVEYS

CONDUCTOR 16

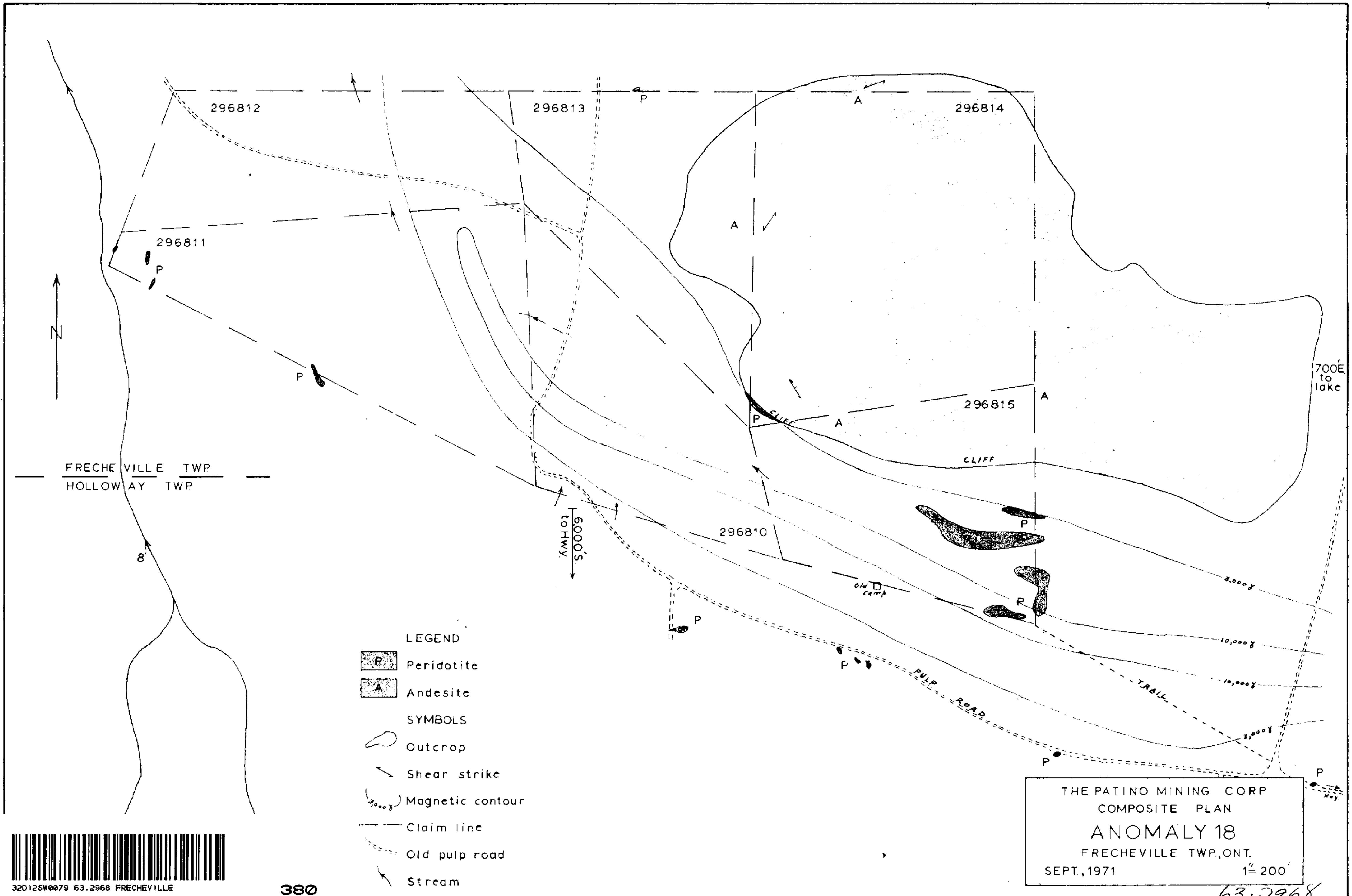
MARRIOT TWP., ONT.

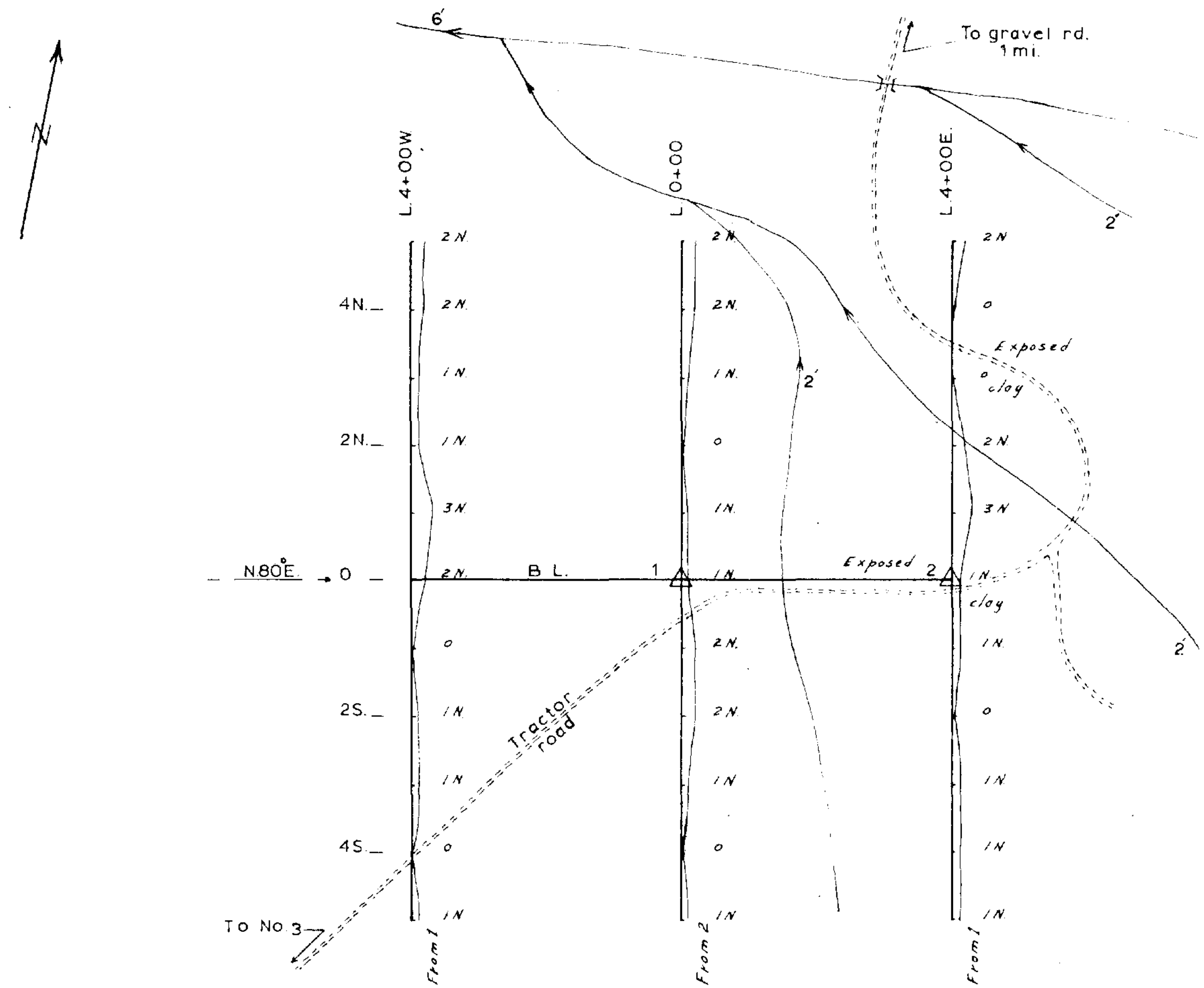
SEPT., 1971 1" = 200'

32D12SW0079 63.2968 FRECHEVILLE

370

63.2968


296812
296813
296814
296811
296815
296810
P
A
N
FRECHEVILLE TWP
HOLLOWAY TWP
8'
6000'S to HWY.
700'E to lake
CLIFF
old camp
PULP ROAD
TRAIL
8,000 γ
10,000 γ
3,000 γ
Hwy
LEGEND
Peridotite
Andesite
SYMBOLS
Outcrop
Shear strike
Magnetic contour
Claim line
Old pulp road
Stream
THE PATINO MINING CORP
COMPOSITE PLAN
ANOMALY 18
FRECHEVILLE TWP., ONT.
SEPT., 1971
1"= 200'
32D12SW0079 63.2968 FRECHEVILLE
380
63.2968



△ TX LOCATION

20° TILT = 1"

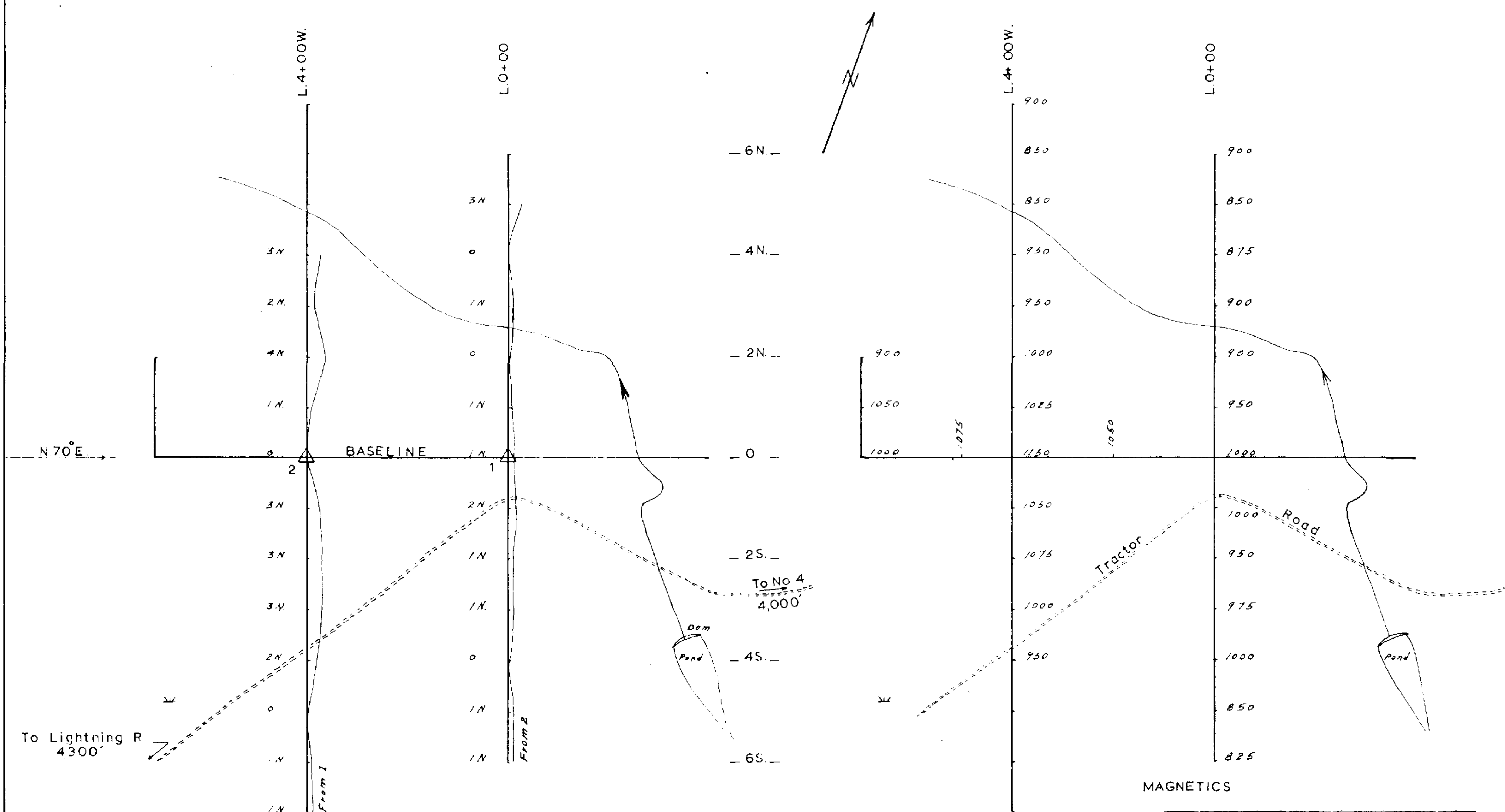
THE PATINO MINING CORP.
SE 200 E.M. SURVEY

CONDUCTOR 4

FRECHEVILLE TWP., ONT.

SEPT., 1971 1" = 200'

63.2968



THE PATINO MINING CORP.
GEOPHYSICAL SURVEYS
CONDUCTOR 3
FRECHEVILLE TWP., ONT.
SEPT., 1971 1" = 200'

63.2968

32D12SW0079 63.2968 FRECHEVILLE

400

020 RECEIVED JAN 14 1972 PROJECTS SECTION

63.2968 (B)

REPORT OF GEOLOGICAL AND GEOPHYSICAL SURVEYS AND DIAMOND DRILLING IN THE ABITIBI LAKE AREA, ONTARIO

TOWNSHIPS OF LAMPLUGH, FRECHEVILLE, STOUGHTON & MARRIOTT

FOR THE PERIOD SEPTEMBER 1 - NOVEMBER 30, 1971.

THE PATIÑO MINING CORPORATION

TORONTO

NOVEMBER, 1971

J. A. BOYD.

INTRODUCTION:

An airborne geophysical survey was flown, in the Kirkland Lake area of Ontario, for the Patiño Mining Corporation in June, 1971. The survey was flown by Questor Surveys Ltd. of Toronto and consisted of an INPUT electromagnetic and a total force magnetic survey.

Sixteen anomalies were located and investigated on the ground. Six groups, totalling fifty-four claims, were staked on the most interesting anomalies.

This report is submitted in compliance with the requirements of the Exploration Assistance Agreement between the Ontario Department of Mines and Northern Affairs and The Patiño Mining Corporation.

The report describes detailed geophysical and geological work performed on seven of these groups and the subsequent diamond drilling of four of them.

CONCLUSIONS:

Four of the anomalies proved to have conductors of sufficient interest to warrant investigation by diamond drilling. One hole was drilled on each anomaly

The drill holes intersected conductors but, in each case, these proved to be graphitic tuffs and agglomerates and of no economic interest.

A fifth anomaly, No. 18 in Claim Group C was found to lie over ultrabasic rocks. This group was prospected with a view to locating nickel-bearing sulphides in the peridotite. No sulphides were found.

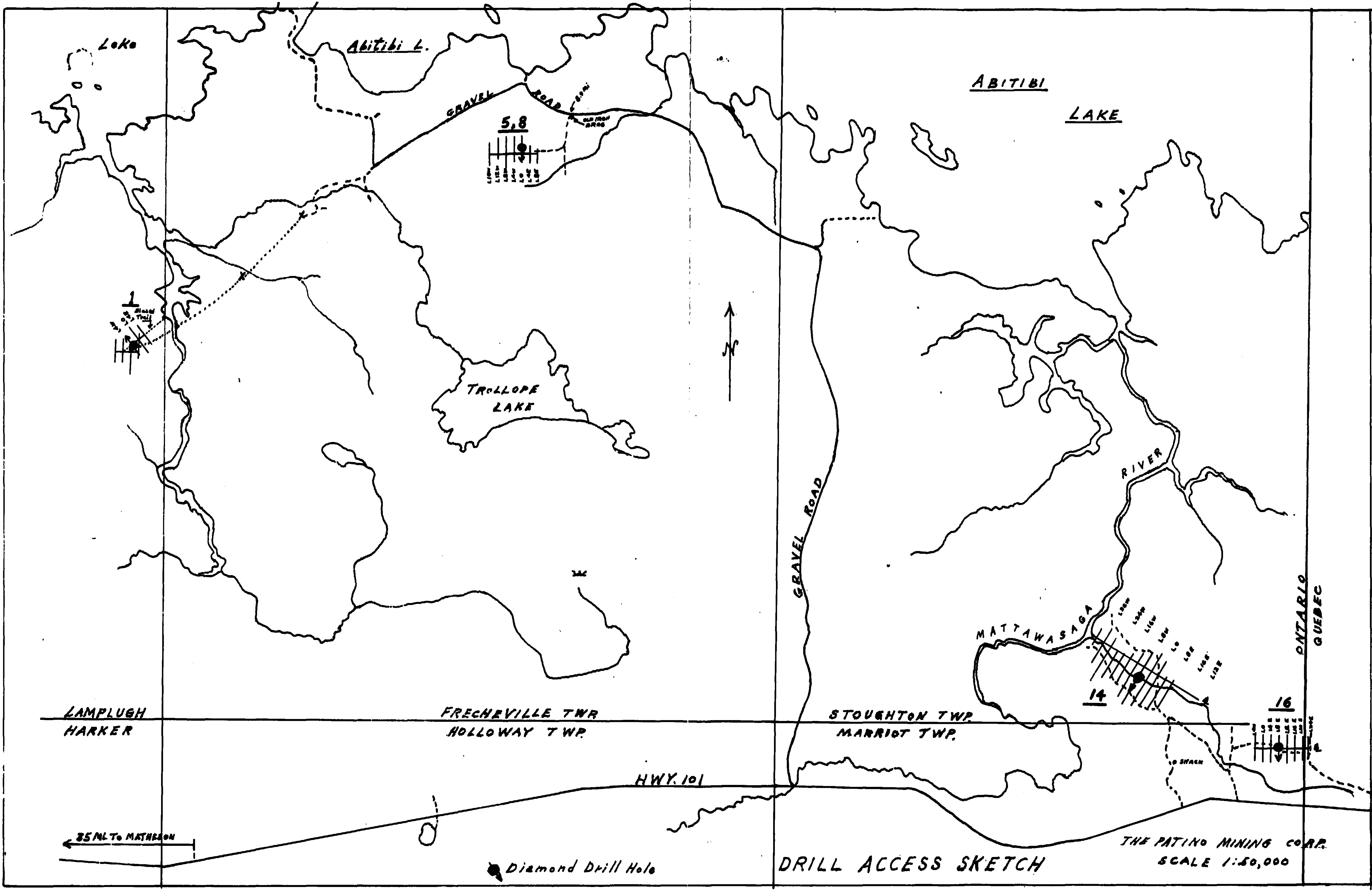
LOCATION:

All the anomalies were located between Highway 101 and the south shore of Lake Abitibi and lie 35 to 45 miles east of the town of Matheson.

More particularly, the claim group locations are as follows:

Group A (Anomaly 1)	-	Lamplugh Township
Groups B, C & D	-	Frecheville Township
Group E	-	Stoughton Township
Group F	-	Marriott Township.

All groups, and the limits of the airborne survey, are shown on the accompanying property plan.



DRILL ACCESS SKETCH

ACQUISITION OF CLAIMS:

Fifty-four claims in six groups were staked by employees on behalf of the company. The groups and their respective claims are listed below:

Group	Anomaly No.	Township	Claim Numbers	
A	1	Lamplugh	L296800-803	(4)
B	6,7,10,11,12	Frecheville	L317904-923	(20)
			L317009-318001	(4)
C	18	Frecheville	L296810-815	(6)
D	5,8	Frecheville	L296804-809	(6)
E	14,15	Stoughton	L296792-799	(8)
			L318440-442	(3)
F	16	Marriott	L318438-439	(2)
			L318443	(1).

ACCESS:

Access to the area is fairly good. Highway 101 runs east-west along the southern boundary and various winter pulp roads run north from it. The bush roads are in poor to very poor condition with numerous washouts but were generally useable.

A 12 mile gravel road extends north and west to Lake Abitibi from a point near the Mattawasaga River bridge on Highway 101. This road provides access to Claim Group D and a departure point for travel to Anomalies 4,3 and 1.

The bush itself is full of down timber and slash from old pulp operations which made traversing and linecutting more difficult than usual.

TOPOGRAPHY:

The area is one of generally low relief with a maximum of 400 feet. Drainage is to the north into Lake Abitibi via the Mattawasaga and Lightning Rivers which are slow and meandering. There is moderate low relief around Lake Trollope where some hills rise two to three hundred feet above the lake level. Extensive sand flats occur along the boundary of Frecheville and Stoughton Townships. The valleys are filled with glacial clays and fine sand to depths exceeding 100 feet.

GENERAL GEOLOGY:

The area lies immediately north of the Destor-Porcupine Fault in a elt of volcanic rocks of Archean age that extends westward through Frederick House Lake as far as Kidd Township. Sketchy reconnaissance mapping indicates that the rocks are chiefly basic flows and pyroclastics, with some basic intrusives and acid flows.

There is considerable outcrop in the northern part of Frecheville Township, but there is extensive overburden in Stoughton Township and in the central parts of Frecheville and Lamplugh Townships.

Rocks noted in the vicinity of the anomalies included diabase, gabbro and peridotite, andesite, dacite and rhyolite and related tuffs and agglomerates.

PREVIOUS WORK:

Very little exploration work has been reported in the survey area. Until the construction of Highway 101, access was difficult. Some cursory prospecting was done from Lake Abitibi.

A gold showing was reported on the shore of Boundary Bay in Stoughton Township, also a zinc showing (now flooded) on the Ghost River in Rand Township. Some exploration was done for asbestos in the ultrabasic at the south boundaries of Lamplugh and Frecheville Townships.

The area has been flown previously with a variety of airborne electromagnetic equipment and at various flight-line spacings. It was felt that INPUT equipment and 1/8 mile line-spacing would provide better coverage, resolution, and depth penetration than the preceding surveys.

Two of the stronger INPUT anomalies were found to have been located and drilled. One was our Conductor No. 9 about one mile northeast of Trollope Lake and the other was in the Trollope Lake Claim Group B. In each case core observed at the hole collars showed barren sulphides and graphite.

CURRENT WORK:

The Questor survey located seventeen conductors, as listed in their report which is appended to this one. Also, an eighteenth conductor was imprecisely located to the south of the survey limits as the aircraft made a turn between flight lines. The conductors were numbered 1 to 18 as in the Questor report, the turn-around conductor being No. 18.

It was possible to locate all the conductors quite accurately on the ground with the aid of the four miles to one inch air-photo mosaic, and the 35 millimetre film strip of the flight paths.

From the preliminary work the conductors were categorized as follows:

Nos. 2 and 13
- located in a lake and swamp respectively
- considered to be due to surface conductors
- no further investigation.

Nos. 3,4,15,17
- considered to be weak, possibly surface conductors
- checked on the ground with vertical and horizontal loop E.M. equipment and no conductors located
- no further investigation of Nos. 15 and 17.

No. 9
- good conductor, partially exposed on a ridge.
- drilled by previous investigators
- core found near hole collar and consisted of andesite and tuffs with barren pyrite and pyrrhotite and graphite.
- some disseminated pyrrhotite in adjacent rock
- no further investigation.

Nos.6,7,10,11,12
- conductivity ratings were good to weak but all considered to be bedrock.
- twenty-four claims staked (Group B)
- work included line grid, horizontal and vertical loop E.M. survey, magnetometer survey and geological mapping.
- two existing drill holes and core located on best conductors No. 7 and 10. The core included widths to 200 feet of graphitic tuff and agglomerate

- no further investigation.

No. 1 - weak bedrock conductor
- four claims staked (Group A)

Nos. 5, 8 - weak conductor
- six claims staked (Group D)

No. 14 - good strong conductor
- eleven claims staked (Group E)

No. 16 - weak conductor
- on easternmost flight line, could be end of a more extensive conductor.
- three claims staked (Group F).

No. 18 - turn-around anomaly, location unreliable
- considered interesting due to presence of ultrabasic rocks.
- six claims staked (Group C).

The most recent work was done on conductors 1, 5-8, 14, 16 and 18. Some further check-work was also done on anomalies 3 and 4. This work is detailed below and plans, profiles and sections are included.

All conductors are covered by varying thicknesses of glacial clays. The masking and attentuating effect of these clays could have resulted in weak INPUT anomalies actually being due to larger and stronger bedrock conductors than indicated.

CONDUCTOR NO. 1:

This conductor is two miles up stream and half a mile west of the Lightning River in Lamplugh Township. It was a three channel INPUT anomaly on two adjacent flight lines and appeared to strike southeast-northwest.

A flanking magnetic high was indicated 350 feet to the northwest.

A line grid was cut with zero at the claim post in the centre of the four claim group.

The initial SE200 (vertical coil E.M.) search survey indicated a possible conductor trending southeast but the standard method check survey failed to show a well-defined conductor. However, a conductor striking N55°E, was located northeast of the plotted A.E.M. position.

Another small grid was cut with zero at 6+00N, on line 8+00E on the first grid. The SE 200 equipment was used on three lines, and the SE600 in horizontal coil mode was used to check this conductor. The SE200 indicated a weak to moderate strength conductor for which the SE600 showed a poor conductivity.

The conductor lies in a 500 foot wide valley between a low ridge of andesite to the southeast and a more pronounced ridge of diabase some 250 feet to the northwest. A reconnaissance magnetic survey showed no correlation with the EM conductor but did show a 6,000 to 8,000 gamma relief over the diabase ridge.

Overburden was estimated to be fairly deep, and the target considered as one of medium priority.

A drill-hole was collared at Line 4+00 West (Baseline 2) and 1+30 South. The hole was directed N35°W at a dip of 50 degrees.

Overburden proved to be 52 feet deep, vertically, of which 24 feet was clay, the rest fine sand and some gravel. Rocks intersected were acid to intermediate tuffs and agglomerates and dacite. The pyroclastics contain 2 to 7% disseminated sulphides. The sulphides are pyrite, minor pyrrhotite, plus a few grains of chalcopyrite. Core angles indicate that the rocks dip 75 to 80 degrees north.

A graphitic section of tuffs, from 228 to 257 feet in the hole, is considered to be the cause of the anomaly.

CONDUCTORS 3,4:

These weak conductors had been checked with the SE600 equipment in the horizontal coil mode. The operator concluded that he was getting typical clay effects in each case and that there were no vertical ground conductors. Examination of the profiles suggested that there was evidence of a poor conductor at the south end of the search grid.

Both grids were subsequently extended and each area checked with the SE200 vertical coil equipment. No 'cross overs' (conductors) were located. A reconnaissance magnetometer survey on Area No. 3 showed no significant pattern.

CONDUCTORS No. 5-8:

Conductors 5 and 8 are the result of flying over the same conductor with two different flight directions. It is essentially three 3-channel intercepts striking east-southeast over a length of 1,000 feet.

A grid was set up over the conductor on the centre east-west claim line with zero at Post 1 of claim 296807.

A horizontal coil SE 600 survey was completed over the lines, and also a magnetometer survey. A relatively poor but definite conductor was located with a length of 800 feet,plus weaker extensions, and striking N65°W-S65°E. It was concluded that the conductor was near-surface, steeply - dipping, less than 100 feet wide, and not very conductive, with some slight, indirect magnetic relief.

The SE200 vertical coil equipment was used to do a standard method check-survey over three lines. Moderate strength 'cross-overs' were obtained and the conductor was recommended for drilling.

The conductor is covered with overburden (clay and fine sand) but an outcrop of andesite lies a few hundred feet north. The outcrop area is 600 feet by 1,200 feet and includes a fifty foot wide band of tuffs. The tuffs strike N65°W and dip vertically to 85°N. To the south and west there are extensive outcrops of medium to fine-grained, massive andesite with ridges and hills rising two to three hundred feet.

A drill hole was collared at 2 +75N on Line zero and directed south at a dip of 50 degrees. The sandy overburden at the collar was 12 feet deep vertically. The rocks encountered are andesite and related tuff and agglomerate, and two short sections of a quartz-feldspar porphyry. The porphyry is probably an intrusive (sill). Three sections of graphitic tuff and agglomerate occur from 181 to 299 in the hole and are the source of the anomaly. Five to seven percent pyrite is associated with the tuffs as disseminations, fracture-fillings with calcite, and occasionally replacing fragments. Chalcopyrite was noted with pyrite in a minute fracture at 295 feet.

CONDUCTOR NO. 14:

A six and a four channel intercept on two flight lines produced a short, strong, conductive airborne anomaly that was considered to be a priority target. It is near a northwest-flowing creek that runs into the Mattawasaga River and is 1.4 miles north of Highway 101.

A 6,400 foot baseline, bearing N60°W, was laid out roughly parallel to the creek and lines cut from it, with Line zero at the junction of the baseline and an old bush road.

An SE600 horizontal-loop survey was run over four lines nearest to the airborne anomaly locations. Heavy clay cover observed in the area made interpretation difficult but a definite conductor was indicated. Ratios were considered reasonably good and conductivity was rated as weak to moderate. A short, weaker, sub-parallel conductor was also interpreted 300 to 400 feet south of the main one.

A vertical loop SE200 survey was done over ten lines. Moderate to weak tilt angles indicated a conductor in excess of 1,600 feet long in the area of the two airborne anomalies. The conductor width was estimated at a maximum 100 feet. A magnetometer survey over the conductor indicated no direct correlation. A vertical loop check-survey was made over lines 4+00W, 8+00W, and 13+30W to confirm the two sub-parallel conductors. The northern one was rated to have only moderate strength and conductivity, and conductive clay overburden effects were noted. The southern conductor was rated weak but definite and probably due to conductive overburden.

Small scattered outcrops show rhyolites to the north and andesite to the south with a possible contact along the line of the creek. One to two per cent disseminated pyrite was noted at 10+00S on Line 8+00E, and near lines 20+00W and 24+00W on the creek bank on strike with the main conductor.

The importance of the conductor was thus down-graded to some extent by geophysics but it was still considered worth drilling. A hole was collared at Line 8+00W on the north bank of the creek and drilled south at 50°, considerable difficulty was experienced with overburden. The hole flattened markedly and bedrock was reached at 148 feet. Overburden was 98 feet vertically of which 53 feet was clay and the remainder sand and gravel. The hole collared and remained in a graphite "schist". This rock, probably a tuff, has the bedding obscured, and contains 40 to 50 percent graphite and 10 percent fine - grained, disseminated pyrite plus numerous pyritic nodules. Core recovery was poor and caving very bad and the hole was abandoned before penetrating the full thickness of the graphitic rock, which undoubtedly was the cause of the anomaly.

CONDUCTOR NO. 16:

This two-channel, single line anomaly was rated by Questor as weak, possibly due to surface effects. Since the anomaly appeared on the last flight line at the eastern limit of the survey area, it was necessary to check to find out if it was actually the end of a stronger conductor striking to the east. It is one and a half miles southeast of No. 14 and half a mile north of Highway 101. An east-west baseline was laid out in the centre of the claims and lines cut from it.

The SE600 vertical coil instrument located and traced the conductor over an east-west strike length of 2,500 feet. The best 'cross-overs' were located between line zero and line 16+00E. The SE600, in horizontal coil mode, was used to check lines zero and 8+00E. The phase ratios were indicative of a good, strong conductor.

A magnetometer survey disclosed no direct magnetic correlation with the conductor but a parallel magnetic high lies about 300 feet south and has a relief of several hundred gammas. The magnetic high is due to a diabase sill which strikes east-west and is exposed at 4+00S on Line 12+00E. and on the bush road 150' west of the west claim boundary.

Small, scattered outcrops a few hundred feet north of the conductor are medium-grained, massive andesite.

No. 16 was considered to be a definite bedrock conductor, with clean, strong electrical indications, and a good drill target.

A drill hole was collared at 50 feet north on Line 8+00E and drilled south at 50 degrees. Overburden at the collar was 82 feet vertically of which the upper 55 feet was clay, and the remainder fine sand. The hole intersected intermediate, well-bedded, partly altered tuffs. From 158 to 223 feet in the hole the tuffs are graphitic and carry 5% to 10% disseminated pyrite. The most highly graphitic section is from 194 to 211 feet. The graphitic section is the cause of the conductor. Core angles indicate a rock dip of about 80° north. A trace of chalcopyrite was noted at 141 feet. An assay from 138 to 144 feet reported 0.07% copper and nil zinc and gold.

CONDUCTOR-NO. 18:

As stated above this 'turn-around' anomaly was not considered to be accurately enough located for inclusion by Questor in their final report. However, a preliminary report described it as a five channel anomaly and gave a fairly precise location. Six claims were staked on it.

The claims oover a portion of Lightning Mountain (largely andesite), with a relief in excess of 100 feet, and low ground to the south and west which is underlain by peridotite. It was decided to prospect the peridotite with a view to locating disseminated sulphides which might be nickel-bearing. No sulphides were found.

A reconnaissance magnetometer survey outlined the magnetite-rich portion of the peridotite band which strikes west to northwest across the claims and has a local magnetic relief of from 10,000 to 20,000 gammas.

A composite spectrographic analysis of the peridotite reported estimates of 0.2% chrome, 0.1% each for nickel, manganese and titanium and 3% iron.

GEOPHYSICAL EQUIPMENT USED:

The airborne equipment, the INPUT MARK V E.M. system, is described in the accompanying Questor report. The ground equipment used on this project included the following instruments:

1 McPhar Model M700 magnetometer

1 Scintrex SE200 Electromagnetic vertical loop system

1 Scintrex SE600 Electromagnetic horizontal and vertical loop system.

The M700 magnetometer is a vertical field magnetometer employing the fluxgate system. It is hand-held, self-levelling and relatively insensitive to orientation. An electronic adjustment permits measurement of vertical fields from plus 100,000 gammas to minus 100,000 gammas. Five scale ranges are available with a maximum sensitivity of 20 gammas per scale division on the 1,000 gamma range. Readability is 5 to 10 gammas.

The SE200 vertical loop E.M. employs a transmitter and a receiver coil in a two-man operation. The transmitter frequency is 1,200 hertz and maximum effective depth of exploration is 200 feet at a coil separation of 400 feet. Eddy currents are induced in the ground and are anomalously strong over a metallic body. The receiver picks up both the transmitter signal and the eddy current signal. These signals are compared in amplitude and phase in order to determine the source of the anomalous currents. The receiver coil is tilted to minimize, or 'null', an audible signal received on the earphone at successive stations. The tilt-angles are recorded and a curve is plotted from them. Where the tilt direction changes, the resultant 'cross-over' gives the location of a ground conductor axis. The null widths are indicative of the conductivity of the anomalous medium and are narrower over good conductors. Where the transmitter coil is held vertically the dip angles at the receiver coil are measured from the horizontal position. Various other coil configurations may be used depending on the survey requirements.

The SE600 horizontal and vertical loop EM system employs a transmitter and a receiver coil and in vertical coil configuration is quite similar in operation to the SE200. It transmits a stronger signal and uses a frequency of 1,600 hertz.

It is also designed as a moving-source E.M. unit capable of measuring In-Phase and Out-of-Phase signal components when the coils are connected by cable at separations of 200 or 300 feet. In-Phase and Out-of-Phase dials on the receiver coil are adjusted for the best null of the earphone signal. Dial readings may be positive or negative and are plotted as profiles to the same base.

A conductor will show an In-Phase curve of good amplitude and an In-Phase to Out-of-Phase amplitude ratio greater than 1:1.

SUMMARY OF DIAMOND DRILLING:

Hole Number	Anomaly Number	Co-Ordinates	Dip of Hole	FOOTAGE From	To	Advance	
71-1-1	1	1+30S 4+00W	-50oN	0 68	68 404	68 336	Overburden 228-257 Graphitic Tuff
71-(5-8)-1	5-8	2+75N 0+00	-50oS	0 18	18 310	18 292	Overburden 223-299 Graphitic Tuff
71-14-1	14	6+25S 8+25W	-50oS	0 156	156 281	156 125	Overburden 156-281 Graphitic Tuff
71-16-1	16	0+50N 8+00E	-50oS	0 115	115 260	115 145	Overburden 194-211 Graphitic Tuff
				Total		1,255	

The core from holes 71-1-1 and 71-(5-8)-1 is stored 200 feet south of the gravel road by the tractor road which leads to claim group D. The core from holes 71-14-1 and 71-16-1 is stored near the tractor road at 15+00S on line 8+00E approximately one mile north of Highway 101 on claim group E. Drill logs of the above four holes are included with this report.

In sum then, all accessible conductors were located and checked on the ground. The four apparently bedrock conductors were drill-tested. Conductive bedrock material was intersected in each case and provided a satisfactory explanation for the anomaly.

J. A. Boyd

MAPS AND SECTIONS:

The following maps and sections are included with this report:

Scale 1:50,000

Kirkland Lake Area - S. Lake Abitibi Property Plan
S. Lake Abitibi - Drill Access Sketch.

Scale 1 inch= 400 feet
No. 18 Conductor - Composite Plan.

Scale 1 inch= 200 feet

Claim Group A (No.1)	-	Property Plan showing topography and geology
	-	V.L.E.M. Survey
	-	H.L.E.M. Survey
	-	Magnetometer Survey
No. 3 Conductor	-	V.L.E.M. Survey
	-	Magnetometer Survey
No. 4 Conductor	-	V.L.E.M. Survey
Claim Group D. (No. 5-8)	-	Property Plan showing topography and geology
	-	V.L.E.M. survey
	-	H.L.E.M. survey
	-	Magnetometer survey
Claim Group E (No. 14)	-	Property Plan showing topography and geology
	-	V.L.E.M. Survey
	-	H.L.E.M. Survey
	-	Magnetometer Survey
Claim Group F (No. 16)	-	Property Plan showing topography and geology
	-	V.L.E.M. Survey
	-	H.L.E.M. Survey
	-	Magnetometer Survey

Scale 1 inch= 40 feet

4 Diamond Drill Sections - Groups A,D,E and F.

REFERENCES:

Assessment Work Library files

1971: Ontario Department of Mines and Northern Affairs, Toronto, Ontario.

Geological Map P.120, Ontario Department of Mines

1972: Munro - Pontiac Sheet, 1"= 1 Mi.

Geological Map P. 140, Ontario Department of Mines

1962: Iroquois Falls - Lake Abitibi Sheet, 1"= 2 Mi.

Geological Map 2046, Ontario Department of Mines

1964: Timmins - Kirkland Lake Sheet, 1"=4 Mi.

Topographic Map 32 D/12 W, Canada Department of Mines

1966: Lightning River West Sheet, 1:50,000

Topographic Map 32 D/12 E, Canada Department of Mines

1966: Lightning River East Sheet, 1:50,000

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CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Patino Mining Corporation
1401 - 7 King Street East
Toronto, Ontario
Attn J.A. Boyd

REPORT NO. M-0026

SAMPLE(S) OF ROCK - Anomoly #18 - Peridotite

Spectrographic Estimates:

	Sample	Sample	Sample		Sample	Sample	Sample
Antimony	—			Lithium (Li_2O)	—		
Arsenic	—			Manganese	.1%		
Barium	.05%			Mercury	—		
Beryllium (BeO)	—			Molybdenum	.001%		
Bismuth	—			Nickel	.1%		
Cadmium	—			Silver	<.1oz/t		
Cerium (CeO_2)	—			Tantalum (Ta_2O_5)	—		
Chromium	.2%			Thorium (ThO_2)	—		
Cobalt	.005%			Tin	—		
Columbium (Cb_2O_5)	—			Titanium	.1%		
Copper	.005%			Tungsten	—		
Gallium	—			Uranium (U_3O_8)	—		
Germanium	—			Vanadium	.01%		
Indium	—			Zinc	—		
Iron	3%			Zirconium (ZrO_2)	—		
Lead	—						

Figures are approximate:

CODE

H	: High	10-100%	L	: Low	0.1 - 1%	PT	: Possible Trace, presence not certain.
MH	: Medium High	5 - 50%	TL	: Trace Low	0.05 - 0.5%	—	: Not Detected, elements looked for but not found.
M	: Medium	1 - 10%	T	: Trace	0.01 - 0.1%	<	: Less than............................
LM	: Low Medium	0.5 - 5%	FT	: Faint Trace	less than 0.01%	>	: More than............................

Samples, Pulps and Rejects discarded after two months

DATE Nov 17A71

SIGNED

CTA

WESTERN CANADA — 325 HOWE ST., VANCOUVER 1, B.C.

580000m E.
80°00'
45'
30'
Normetal
SCAPA
HEPBURN
STEELE
BONIS
Northeast Bay
Sulphur I
Goodwin
SARGEANT
Boischere Ck
Desmeloizes
DESMELOIZES
Calamine River
La Reine
Dupuy
BERRY
Berry L
Rabbit L
Long Point
Okikodosik Bay
LA REINE
NEPE
NORD
ABITIBI
South Bay
Partridge Point
Kenosha Island
Mistaken Islands
Baie Nepawa
ILE NEPAWA
Clerval
Dominion Island
St Patrick Island
Lightning Point
Boundary Point
ROQUEMAURE
Roquemaure
Ghost River Bay
ABITIBI INDIAN RESERVE 70
RAND
LAMPLUGH
MOUNT SMOLLETT
FRECHEVILLE
STOUGHTON
GHOST RANGE
LIGHTNING
101
HARKER
HOLLOWAY
MARRIOTT
McDiarmid Lake