REPORT ON

GEOLOGICAL & GEOPHYSICAL SURVEYS

SHAW TOWNSHIP, PORCUPINE M.D.

DISTRICT OF COCHRANE, ONTARIO

FOR

PAC EXPLORATIONS LIMITED

BY

BARRINGER RESEARCH LIMITED

304 CARLINGVIEW DRIVE

METROPOLITAN TORONTO

REXDALE, ONTARIO

DECEMBER 1972

1. INTRODUCTION

Pac Explorations Limited hold a block of 10 claims, in Shaw Township, about 6½ miles east-southeast of the Town of South Porcupine. In a report presented to Pac by R.S. Middleton of Barringer Research Limited in June 1972, it was recommended that geological and geophysical surveys be conducted over the claim group in Shaw Township. These surveys are now completed and the following report presents both the findings and further recommendations made in light of them. The geophysical surveys consisting of induced polarization and magnetics were conducted between August 29th and October 5th, 1972. The geological survey was performed between September 29th and October 5th, 1972.

1.1 THE PROPERTY

Pac Explorations Limited hold a 10 claim property in Shaw Township some 11 miles east-southeast of Timmins in the Porcupine Mining Division. These unpatented claims bear numbers:

P. 333251 to P. 333258 inclusive
P. 333720 and P. 333721

and are located in Concession 5, portions of Lots 2 and 3. (See Drawing 5-325-1).

1.2 ACCESS

An excellent gravel, all-weather road joining the INCO-Noranda Langmuir Mine and the Town of South Porcupine passes about 1½ miles south of the property. A bush road passable for 4-wheel drive vehicles leaves this gravel road near its bridge over the Redstone River and travels east-northeast for about a mile, and a foot-path leads another 1½ miles to the property, terminating at Line 28W about 9S. The northeast corner of the claim group can be reached by boat from the Redstone River.

1.3 TOPOGRAPHY

The northeast 1/2 to 2/3 of the property is covered by overburden and is partially

swampy, especially along much of the east boundary of the property. Two very small shallow beaver ponds lie in the south portion of claim P. 333258.

Southwest of the base line, outcrop forms rolling hills of considerable barren rock, possibly constituting 30-40% of the land area southwest of 10S.

Logs of previous drilling, filed for assessment credit, note overburden of up to 142 feet in the northeast portion of the claim group.

1.4 FACILITIES

A water supply is provided by the Redstone River which connects with the northeast corner of the property. A hydro line supplying the INCO-Noranda Mine in Langmuir, passes about 1½ miles to the south of the Pac property. The nearby mining centres of Timmins and South Porcupine afford a source of supplies, services, skilled labour and housing.

1.5 PREVIOUS WORK

Ontario Department of Mines map number P. 343 (1965) by Carlson, covers Shaw Township with geological mapping on a scale 1 inch = 1/4 mile. A regional geological compilation by D. R. Pyke and R. S. Middleton (1970) is available on open file at the Department of Mines Library.

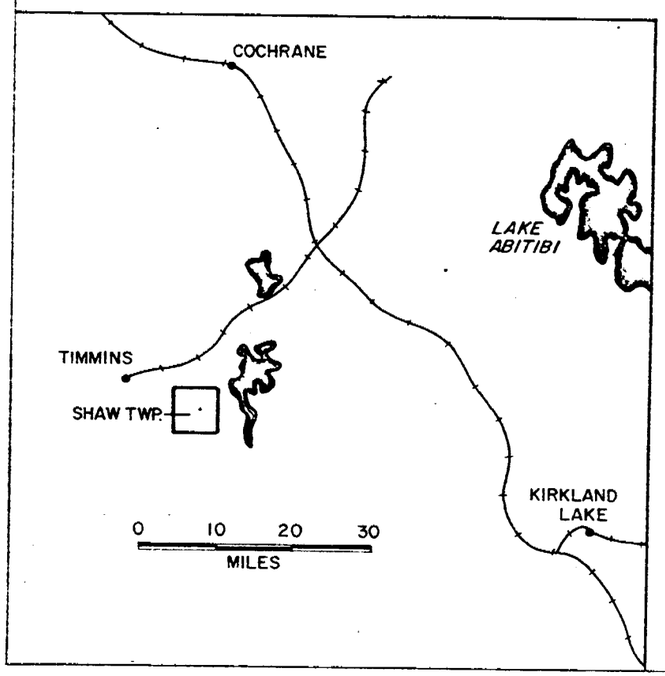
A report on the present Pac Explorations property was written in June 1972 by R. S. Middleton of Barringer Research. Geophysical and geological coverage were recommended at that time, and the following report presents findings of this work.

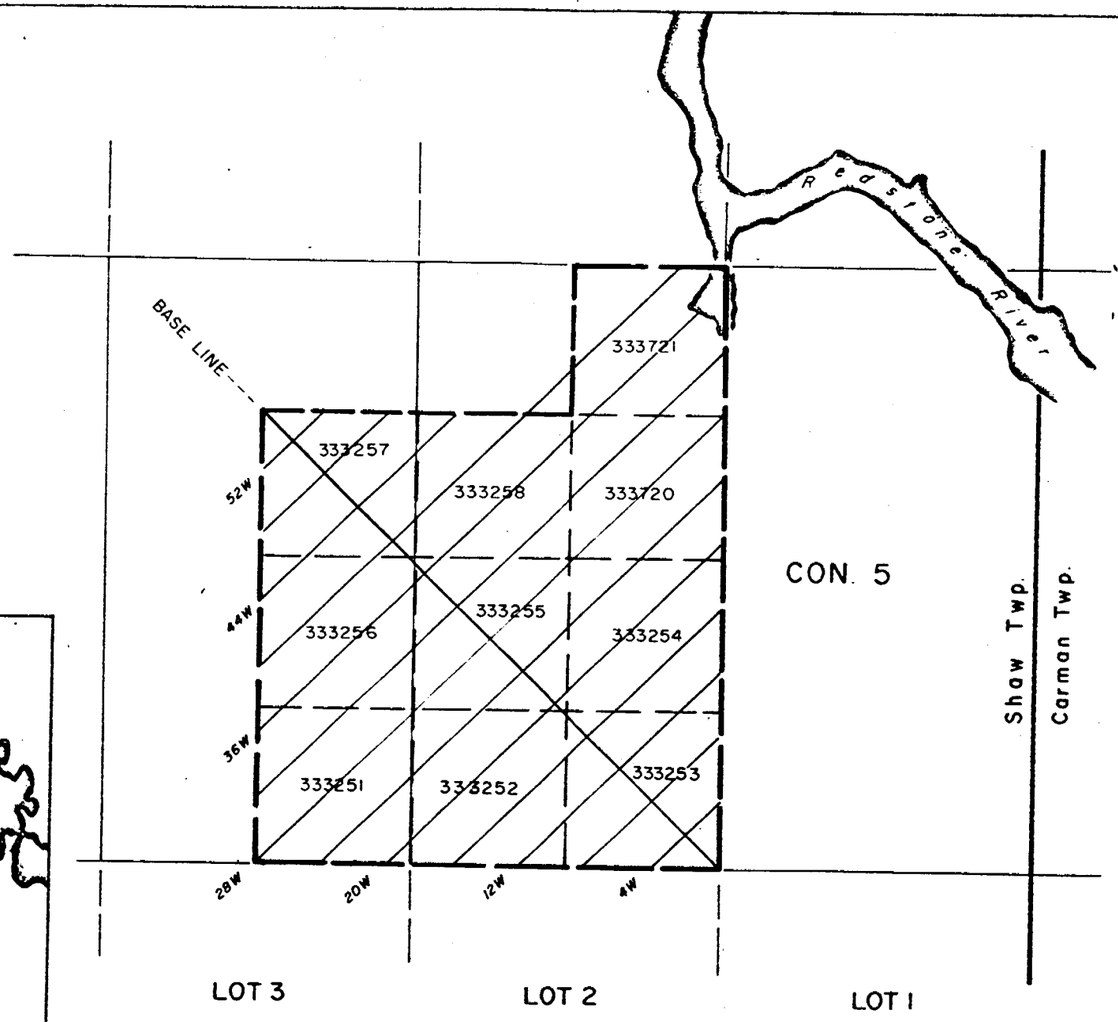
Assessment work files contain geophysical (electromagnetic and magnetic) coverage of various portions of the present claim block done by previous owners, together with logs of two holes drilled by Blackhawk Gold Mines Limited in the northeast portion of the present claim group. They explored a part of an acid intrusive and also cut serpentinite.

2. GENERAL GEOLOGY

The Pac property in Shaw Township is underlain by the Deloro group of flows, pyroclastics and iron formation. The Deloro group is characterized by periodic explosive volcanism and flows (predominantly mafic), with some ash-flow material in evidence. There were one or more central vents connected to a shallow magma chamber. Iron formation is conspicuous in the Deloro group. It consists largely of cherty and dolomitic rocks with minor sulphides and oxides.

The geology of the area is well summarized by R.S. Middleton in a Barringer Research report to Pac Explorations Limited dated June 12, 1972. The property is located on the northeastern portion of a large elliptically shaped geological feature that consists of intermediate to basic flows, felsic pyroclastics and iron formation. Intercalated within this volcanic pile are ultramafic rocks (altered and replaced to talc serpentine) which may be extrusive (D.R. Pyke 1972) or sill-like intrusives. Middleton points out (see Drawing 5-401/C-2) that the ultramafic rocks in Shaw, Carman, Langmuir, Eldorado, Adams, Deloro and Whitney Townships trace out the elliptical structure. Agglomerates throughout the structure suggest that it is a volcanic centre or series of centres. Top directions fall away from the ellipse.





N

A

Work undertaken by
BARRINGER RESEARCH LTD, Toronto, Canada.

PAC EXPLORATIONS LIMITED

SHAW. TWP., PORCUPINE M.D., ONTARIO

LOCALITY PLAN

NOV. 1972	1" = 1320'	DWG. 5-325-1

TISDALE TWP.

WHITNEY TWP

CODY TWP.

South Porcupine

L Porcupine

Night Hawk Lake

DELORO TWP.

SHAW TWP.

CARMAN TWP.

ELDORADO TWP.

ADAMS TWP.

LANGMUIR TWP.

N

A

LEGEND

Falsic intrusives (granodiorite)	4
Ultra mafic intrusive and lavas (serpentine, peridotite, dunite)	3
Felsic pyroclastics and iron formation (agglomerate, rhyolite tuff)	2
Mafic lavas (basalt, andesite)	1
Nickel bearing sulphide deposites	○
Fault	------

Work undertaken by
BARRINGER RESEARCH LTD, Toronto, Canada.

PAC EXPLORATIONS LIMITED

SHAW TWP., PORCUPINE M.D., ONTARIO

GENERAL GEOLOGY

JUNE 1972	1" = 2 miles	DWG. 5-401/C-2

3. GEOLOGY OF THE PROPERTY

The Pac claims are located on the northeastern portion of the elliptical feature described above.

Less than half the 10-claim property has its geology exposed, the northeast portion of the property being nearly entirely covered with overburden. Dwg. No. 5-325-2 forms part of this report and depicts the geology of the property. The Archean flow series strikes northwest-southeast and outcrops some 600 feet south of the base line. Considerable rock exposure in the southwest corner of the property made it possible to see the sequence shown in Table 1.

On the overburden covered half of the property some geology is known from two old drill hole logs, one very small outcrop, and by inference from geophysics.

Near the northeast corner of the property a single small outcrop with a trench on it displays a fault breccia with quartz carbonate cement and narrow quartz veins. Records on file at the assessment library show that Blackhawk Porcupine Mines in 1945 drilled two holes in this area, probably to test the quartz veins and breccia for gold. Assays ran nil gold but the logs refer to 200 feet and 300 feet of serpentine. The exact location of these old drill holes is not known but it is possible that they cut a magnetic feature of low intensity (outlined by a 500 gamma contour) which strikes northeast-southwest across lines 24W to 36W about 20N. This feature lies parallel to a larger one, outlined by a 500 gamma and 1000 gamma contour, which has a subtle IP response and has been interpreted as a possible ultramafic body. Neither comes to the surface. The first mentioned anomaly has no IP expression and has not been considered a possible drill target. The old drill logs show that, on the northeast side, this body is in contact with quartz porphyry.

TABLE 1

TABLE OF FORMATIONS

PRECAMBRIAN	Basic dykes	Olivine diabase
	INTRUSIVE CONTACT	
	Acid (?) intrusive	Quartz diorite (could be part of Mt. Logano intrusive).
Kenoran Era	Mafic and ultramafic intrusions	Ultramafic sill (?) Serpentinite.
	INTRUSIVE CONTACT	
	Other intrusives	Feldspar porphyry (could be massive flow)
	INTRUSIVE CONTACT	
	Sediments	Iron formation - mainly chert and jaspilite with only minor sulphides
	Volcanics	Andesite (vesicular)

The larger magnetic feature is accompanied by a weak IP anomaly. The location of the peaks of the magnetic and IP anomalies are almost coincident at the northeast side of the interpreted outline of the geophysical feature. In this region of Shaw Township, geological knowledge ascribes a northeast dip to the formations and a top direction also northeast. Thus the peak of the IP and magnetic highs lie at the assumed top of the ultramafic instead of at its base where they usually are found because of gravity settling of the sulphides within the ultramafic. It is of course possible that due to a very local structural situation at the time of deposition, the ultramafic was inserted in local synclinal configuration, such that it dips and tops to the southwest, so that the anomalies could in fact lie at the base of the body. Because of this ambiguity concerning dip, further detailed IP would help considerably in determining the best possible collar location and attitude for a proposed drill hole. This geophysical feature merits investigation by drilling.

Southwest of the base line, outcrop has provided a fairly complete picture of the geology in the sequence mentioned in the Table of Formations (Table I).

The andesitic flows are probably the earliest unit present on the property. They occupy much of the southwest corner of the claim group. Although they are apple green in color and resemble dacites thin section work by the O.D.M. has classified them as andesite-basalt. They are very vesicular towards the top of the flow (northeast) and slightly more massive towards the bottom (southwest). Vesicles are now filled with quartz carbonate. This unit is about 1000' to 1300' thick on the property. In the extreme southwest corner it is in contact with the feldspar porphyry (sill?).

Feldspar porphyry occupies the southwest corner of the property. Its assumed contact with the andesite lies approximately in the same direction as the overlying iron formation, and the feldspar porphyry is considered to be concordant. Whether it is intrusive, a coarse flow, or possibly a crystal tuff is not known. However its coarse grained nature favours an intrusive interpretation. It appears to be intermediate composition, the groundmass being dacitic or andesitic in appearance. The greyish white feldspar

phenocrysts are about 2 mm. long and lathlike. It is quite massive and appears devoid of mineralization.

The iron formation is variable in thickness. It is estimated at 100 to 300 feet. Its nature is also variable. Sulphides are a very low proportion of the total rock contact. They are very erratic in distribution, with the heaviest concentration at the trenches on lines 20W and 24W. The more siliceous factors vary from white chert to red jaspilite and black (non magnetic) chert. It is commonly limonitic or hematitic and has frequent carbonate lenses. These latter are commonly towards the top of the iron formation and perhaps in greater amounts towards the east end of the iron formation. Where sulphides were found, they were sampled but no significant values in base or precious metals were found and no trends along strike were recognized.

The portion of the ultramafic sill seen on the Pac claims consists of a wedge shaped area cutting across Line 44W to 36W inclusive. IP response suggests it also extends eastward to Line 32W near the base line. It seems to widen as it goes off the property to the west. It is only subtly different in appearance from the andesitic flows - it is slightly darker in colour, a little more massive, and devoid of vesicles. Spinifex (or quench) texture was recognized at two places: one at Line 36W, 6N which is assumed to be the top of the sill and another occurrence at about 10S on Line 40W. The latter is assumed to be the bottom of the sill. There is considerable serpentization at the quench locations. Recognition of the sill has relied heavily on quench textures when they occur, and the limited amount of microscope work done. Thin sections of the spinifex rock indicated that over 40% of the original quenched rock was olivine. There is an IP response associated with the sill at depth possibly 100 to 300 feet below surface. Like the sill, the IP anomaly is "open" to the west. Rock geochemistry attributes 620 ppm Copper and 84 ppm Cobalt to the quench rock (total analysis using 40% hot perchloric acid digestion). A cold extraction (acetic acid) test was requested for comparison but results have net yet been received.

A quartz diorite intrusive mass or dyke occurs near the southern end of Line 40W. Another outcrop of more porphyritic nature occurs near 35+50W, 10+50S. These two quartz bearing rocks, together with an outcrop near location 16S (off the property) on the projection of Line 40, may be on a apophysis of the Mt. Logano granite porphyry which lies north of the property, east of Goose Lake.

An olivine diabase dyke cuts across the flows on the property. It can be found crosscutting the flow sequences and is lost under overburden at about the projected base of the ultramafic sill. In places it contains coin-sized aggregates of olivine, is very coarse grained and is fresh in appearance. It is mapped (O.D.M. P343) as Matachewan or Keweenawan diabase.

4. GEOPHYSICAL SURVEY

4.1 SURVEY PROCEDURES AND INSTRUMENTATION

The induced polarization system used is a 7.5 Kw time domain system. The system consists of a Newmont Mark IV receiver manufactured by Crone Geophysics of Toronto and a 7.5 Kw transmitter, manufactured by Huntec Limited of Toronto.

The time domain IP method consists of passing a direct current through the ground. This builds up a charge at the interface between metallic minerals (electronic conductors) and electrolytes (ionic conductors). The current is then switched off and the redistribution of these charges is measured as a voltage decay at the ground surface. Comparison of this secondary voltage (Vs) with the primary voltage (Vp) provides a measure of the chargeability of the subsurface.

The system consists of a generator set, a transmitter and a receiver. The generator set consists of an engine driven alternator and voltage regulator. These provide the primary three phase power at 120VAC - 400 cps to the transmitter. The transmitter contains the circuitry to step up and convert the primary AC voltage to a rectangular low frequency waveform, the amplitude of which can be controlled by the operator. The transmitter also contains circuitry for the current. A 2 second "power on" and 2 second "power off" cycle was used for this survey. The polarity of the current is reversed for consecutive "on" pulses to eliminate any slow buildup of charges. The receiver contains its own power supply and is used to measure the primary Vp potential between two potential electrodes. Vs is automatically measured and Vs/Vp is integrated to give the chargeability in milliseconds.

The pole-dipole array was employed for this survey. This array has an "infinite" stationary current electrode, one moving current and two moving potential electrodes. The potential electrode spacing was 200 feet (i.e., a = 200 feet) and the spacing between the current electrode and the nearest potential electrode was 400 feet (i.e., n = 2). Detail coverage was done at n = 3.

Stainless steel rods were used for the current electrodes while porous pots were used for the potential electrodes.

Readings were taken every 200 feet along picket lines spaced 400 feet apart.

The magnetic survey was carried out using a Sharpe MFI and a McPhar M700 fluxgate magnetometer. These measure the vertical component of the magnetic field set at an arbitrary background. A total field magnetometer could not be used due to steep magnetic gradients in the area.

Readings were taken every 100 feet closing to 50 feet in areas of high magnetic gradient.

4.2 PRESENTATION OF THE RESULTS

4.2.1 General

The geophysical data are presented on maps at a horizontal scale of one inch equals 200 feet, showing survey lines, survey stations, claim boundaries and claim numbers.

4.2.2 Induced Polarization Survey

The results of the IP survey are presented in contour form with apparent chargeability and apparent resistivity data presented on separate maps. Detail readings at n = 3 are shown in brackets by the corresponding station on the above maps. Normalized chargeability values are shown for the south half of the grid. The normalized chargeability is simply M/ρ_a x 1000 (apparent chargeability/ apparent resistivity times 1000). This removes anomalies due to bedrock changes and emphasizes anomalies due to mineralization.

4.2.3 Magnetic Survey

The magnetometer results are presented in contours of equal intensity of the earth's vertical magnetic field. The value of the vertical field is indicated at each station.

4.3 INTERPRETATION OF GEOPHYSICAL SURVEYS

4.3.1 General

The Pac Explorations Limited property is located on the northeast portion of a large elliptical feature consisting of felsic pyroclastics, iron formations and ultramafic intrusive bodies (Pyke and Middleton, 1970). The property is thus situated in a geological setting that is associated with nickel-bearing sulphide bodies in the area. The present survey was carried out to delineate the possible presence of an ultramafic body interpreted from government

aeromagnetic maps as well as establishing the ground location and extent of the iron formation within the property.

4.3.2 Magnetic Survey

The magnetic survey reveals three prominent features. These have been numbered 1, 2 and 3 on the magnetic contour map (Dwg. 5-325-6).
The first feature is an iron formation trending N 45°W. The presence of the iron formation is confirmed by geologic investigation of the property done by Mrs. M. Halladay of Barringer Research Limited. The iron formation is a narrow body (approximately 300 feet wide) and crosses the entire property at 10S. A southward displacement of the magnetically high area on Lines 32W, 36W and 40W is interpreted as being caused by a fault trending approximately N-S.

The second area is a broad zone extending on both sides of the base line and trending approximately N 45°W. This area is characterized by low values with a few local highs. There is one high area north of the baseline extending over Lines 8W, 12W and 16W but other than that there are only spot highs. These are probably caused by isolated geologic features containing higher magnetic susceptibility rock types or phases.

The third area of interest located northeast of the base line is a magnetically high area trending approximately N 45°W and extending across the entire grid. This is interpreted as being caused by an ultramafic body. There is no outcrop in the area to confirm or eliminate this possibility but the high corresponds to an aeromagnetic anomaly interpreted to be caused by an ultramafic body. Two drill holes near the northern boundary of present Claim No. P 333721 intersected 200 feet and 300 feet of serpentine.

4.3.3 Induced Polarization Survey

(i) Resistivity Survey

The resistivity data follows the same general pattern as the magnetic data.

There is an area of high resistivities south of the iron formation. This is an area of andesite with a few diabase dykes trending N-S. The interpretation of a fault from the magnetic data is supported by a southward shift of the resistivity contours between Line 28W and 32W.

The iron formation is on the flank of the resistivity high with part of the iron formation being in a resistivity low. This indicates the high resistivities are related to the andesite not the iron formation.

The rest of the area contains low resistivity values that show the same trend as indicated by the magnetic data. The resistivity data cannot however be divided into broad zones as in the case of the magnetic data. There is one zone of slightly higher resistivities over the interpreted ultramafic body. This is centred on Line 32W at 11N and extends over to Line 38W and 36W. The resistivities in the north end of the property may be lower than expected due to the effect of the clay overburden in the area and the incorporation of the clay layer in the measurements.

(ii) I.P. Survey

The chargeability data follows the same trends as the resistivity and magnetic data in the south part of the property but not on the north side of the baseline. Most of the area south of the base line is highly anomalous with the highest values being

obtained in the iron formation close to the contact with the andesites. It should be noted that the high chargeabilities observed in the andesites correlate with the increase in resistivity.

There are four main areas of interest on the property.

(a) Area 1

The first area is centered at 13S on Line 16W. There is no outcrop here but the iron formation outcrops 200 feet to the north. The resistivity increases in this area indicating that it is on or near the contact between the iron formation and the andesites. Magnetics indicate this area is outside the iron formation and therefore may lessen its significance but it cannot be discarded on this basis. The normalized chargeability indicates that the anomaly is genuine. Detail surveying at n = 1 suggests that the polarizable material comes close to surface. As this area is on the edge of the property it is open to the south.

(b) Area 2

The second area is centred on Line 28W at 10S. This area is also located on or near the iron formation - andesite contact and is on a magnetic high. This area showed the highest reading on the property and is just south of a resistivity low extending to Line 32W and towards Line 24W. The normalized chargeability again indicates this to be a genuinely anomalous zone and not merely a reflection of changes in the composition of the bedrock. Because of the magnetic correlation, magnetite may be the principal cause of the IP anomaly although pyrite is known to occur in the iron formation.

(c) Area 3

The third area extends from Line 32W between 00 and 4S across Line 36W to Line 40W between 8S and 11S. This anomalous zone has its highest values on Line 40W and is open to the west. The outcrops in this area are of an ultramafic intrusive. The magnetic anomaly following the iron formation extends towards this area, however, the iron formation does not outcrop on Line 32S near the base line within the anomalous IP zone. Furthermore the magnetic and IP anomaly trends are not in the same direction suggesting that the IP zone is not iron formation but possibly sulphides at depth in the ultramafic body that outcrops on Line 40S.

This anomalous zone is located in a resistivity low on Lines 32W and 36W with an increase in resistivity on Line 40W. The normalized chargeability indicates that it is a genuine anomaly but shifts the maximum of the anomaly to 6S on Line 40W. This is in part due to the extremely low resistivity of 9 ohm-metres at 6S on Line 40W as compared to 1150 ohm-metres at 10S, Line 40W. Detail work at n = 3 shows that the polarizable material continues and/or increases at depth.

(d) Area 4

The fourth area of interest lies in the interpreted ultramafic body north of the base line and is centred on Line 24W at 11N. It is also centred on a magnetic high indicating the presence of pyrrhotite and magnetite and thus possibly nickel mineralization. There is a slight increase in resistivity but this could reflect a change in bedrock topography or a change in the clay overburden. This area is located on a small ridge rising from a lower, slightly swampy area.

The chargeability readings increase with depth (i.e., n = 3) which indicates that polarizable material continues or increases in amount.

This anomalous zone appears to be the centre of a broader slightly anomalous zone trending approximately N 30° W and extending over to Line 40W.

4.4 SUMMARY OF GEOPHYSICAL RESULTS

The magnetic survey outlined three prominent areas: the iron formation trending N 45° W and two zones also trending approximately N 45° W. These have been numbered 1, 2 and 3 on the magnetic map. The iron formation is zone 1. Zone 2 extends on both sides of the base line and is characterized by low readings, while zone No. 3 lies north of the base line and is interpreted as an ultramafic body.

The resistivity data confirms the trends noticed in the magnetic data and outlines an area of andesites south of the iron formation. A fault trending north-south has been interpreted in the southwest corner of the property.

The chargeability contours reveal four zones of high readings centred on L16W at 13S, L28W at 10S, L40W at 10S and L24W at 11N.

The first two zones appear to be related to the iron formation-andesite contact. The third zone (L40W at 11S) appears to cross the magnetic trend and is associated with an outcropping ultramafic sill or flow.

The fourth zone is on Line 24W centered at 11N. The high reading, while not nearly so high as the previous three zones is still about three times background. This chargeability zone, (12 milliseconds), also occurs on a magnetic high in an interpreted ultramafic body indicating the possible presence of pyrrhotite and thus possibly nickel mineralization.

All four zones show similar or increasing values with depth indicating polarizable material increases at depth.

The normalized chargeability readings show all four areas to be genuinely anomalous and not merely reflections of bedrock topography changes or variations in the composition of the bedrock.

5. ECONOMIC GEOLOGY

The Pac property in Shaw Township affords three possibilities in the search for economic mineralization.

1. Gold mineralization associated with acid intrusives or quartz veins.
2. Precious or base metals associated with iron formation.
3. Nickel mineralization associated with ultramafic rocks.

5.1

The mineable gold (and copper) intrusive deposits of Timmins are usually found in the acid intrusives of the area. Intrusives, possibly of similar nature, are present in two locations on Pac. The old drill holes in the northeast corner of the property cut quartz porphyry. Sections were apparently assayed with negative results. Quartz diorite occurring to the south near the outcropping ultramafic could have associated gold values. It has not been thoroughly prospected.

5.2

The iron formation was found to contain few sulphides. When these were seen, they were sampled and assayed. Eight samples along the strike of the iron formation were run with poor results: all gold values were below 0.01 oz/T., all silvers were below 0.09 except one which ran 0.15 oz/T.; all samples ran less than 0.04% copper. The highest lead was 0.02% and all zinc analyses were nil or trace. Most of the iron formation gives an IP response due to the minor sulphides, but two anomalies stand out. They are on Line 28W and Line 16W, on the assumed contact between iron formation and the underlying andesite flows. The latter lies in an overburden area 200 ft. south of outcropping iron formation. It has been assumed that these form parts of the iron formation, but the magnetic contours suggest they may be separate entities. They may also arise from pyrite rich zones within the andesite flow tops. Further west, on Line 36W about 16S considerable pyrite is seen as disseminated cubes

within the flow and as vesicular fillings with, or instead of, quartz carbonate.

5.3

Ultramafic rocks are known in two localities on the property, and are interpreted to exist in a third. The exact location of the ultramafic in the northeast corner of the property is not known. Although a possible location of such a body is outlined by the 500 gamma magnetic contour line, the IP has outlined no mineralized area. This body is assumed to be barren.

The second area lies north of the base line. It is roughly outlined by the 1000 gamma magnetic contour and is centred on an IP anomaly on Line 24W at 11N. There is an associated magnetic high and the central anomalies are believed to be caused by pyrrhotite and magnetite. The cause of this anomaly warrants investigation by drilling. Because the anomaly lies at the assumed top of the interpreted ultramafic body, and because mineralization within an ultramafic sill would be expected to lie at the base of the sill, ambiguity arises concerning the dip of the structure and consequently some difficulty is encountered in determining the best location and inclination for a test hole. A minor amount of additional IP information would be of assistance.

The third area of ultramafic rocks outcrops in the west central part of the property. It exhibits spinifex (quench) textures which petrographic studies indicate were originally over 40% olivine. This rock was analysed to contain 620 ppm Nickel, 140 ppm Copper and 84 ppm Cobalt by hot perchloric acid digestion, which is within the range of the ultramafic flows and sills of the area. The ultramafic is accompanied by a good IP response. These ultramafic sills and flows of the northern Gold Belt area are believed to be of the same deep origin as those which contain the rich nickel ores of Australia.

In Canada they are generally of three grades of mineralization:

1. Barren.
2. Low grade uneconomic mineralization.
3. Mineable deposits generally much smaller than those of Australia.

Currently they are prime exploration targets for nickel in this Country. Several in Canada are known to contain mineable orebodies. In the immediate area of the Pac property, INCO and Noranda are mining an ultramafic body some 10 miles southest of Pac (their Langmuir deposit) and for the last year INCO has been drilling another one some 3 or 4 miles to the west of Pac claims. Further away are the similar deposits of Texmont in Bartlett Township (under mining development) and the McWatters, Hart and Alexo deposits. Marbridge was of similar type.

In light of the above considerations it is apparent that the ultramafic sill (?) seen on the Pac property is a good exploration target. It is probable that the segment of the ultramafic seen on Pac represents only a portion of the sill, the remainder occurring further to the west. It is recommended that further ground be acquired.

An interesting relationship seems to exist between ultramafics and the pattern of airborne magnetic contours. This is illustrated in Map No. 5-325-7 which shows only the ultramafic (and diabase dykes) in relation to the magnetic contours. There are two different interpretations; as follows:-

Noting the apparent continuation between the Langmuir ultramafic area and the large oval anomaly south of Pac, it is possible that known ultramafic rocks south of Pac may closely follow the 1000 to 14000 gamma contour line. If so, the map would suggest a possible extension of the Pac ultramafic some 7 claims to the west. It is recommended that claims covering this possibility be acquired. The alternative interpretation concerns the fact that certain ultramafic bodies in the Timmins area are known to have low magnetic expressions. (Middleton, personal communication). The portion of the sill seen on the Pac claims ranges lower in magnetic intensity than the iron formation and thus may be represented by contour lines lower than 1000 gammas. In order to cover either possibility, it is suggested that 21 claims be staked to the west of the Pac ground: a block 7 claims east-west by three claims north-south adjoining the west boundary of the original Pac group.

Ontario Department of Mines' Preliminary map, P343, does not indicate any previous drilling recorded on the proposed claim group and it is possible that the ultramafic sill (?) has not been tested. Mineralization in such ultramafic bodies is generally of disseminated nature and would be located by an IP survey (Middleton, P.6) but might be a very weak conductor by other survey methods and so remain untested to date.

6. CONCLUSIONS AND RECOMMENDATIONS

Geological and geophysical surveys of the Pac property in Shaw Township lead to the following conclusions:

1. Most of the gold mines of the Timmins Area are associated with acid intrusives. Quartz-diorite seen on the southern part of Line 40W and possibly extending to the east may be an affiliate of the Mt. Logano acid intrusive to the north. The quartz-diorite is in part poorly exposed and merits prospecting. This is given a lower priority than recommendations below.

2. Two strong IP anomalies are associated with the andesite-iron formation contact. The strongest response is on Line 28W near 10S (IP area 2). Magnetic contours may suggest this anomaly lies outside the iron formation. Its source may be at a depth of 100 to 300 feet. The second anomaly on Line 16W at 13S (IP area 1) lies under overburden and may be of similar origin. It is recommended that a line of 10 soil samples be taken across each of the two locations: 8 samples at 50 foot intervals across the anomalous areas and two samples on each line away from the anomaly to serve as background. The sampling would be very inexpensively done and would provide a good idea of the nature of the IP anomaly.

3. An exposed ultramafic body (IP area 3) and an assumed ultramafic body (IP area 4) were located by the surveys. These are sill or flow rocks similar to those under mining development for nickel-copper by INCO-Noranda in Langmuir Township, and under exploration by INCO in Shaw Township. Such ultramafics represent good exploration targets. Both the ultramafic and the assumed ultramafic have associated geophysical targets and merit testing by diamond drill. The exposed ultramafic is known to extend to the west, off the claim group, and to have a strong IP expression. Claims should be staked to cover this extension, which should then be studied by geological and geophysical surveys.

It is recommended that a fluxgate type magnetometer be used because of anticipated occurrences of iron formation, and that the base line should be directed east-west to accommodate change of strike in this area. Line spacing should be 400 feet and a portion of the previous survey should be redone for correlation purposes between the surveys.

Subsequently the best drilling targets should be tested.

At the same time as the geophysical surveys are extended over the new block to the west, limited detailed geophysics should be done on Line 24W in the area of 10N in order to define depth to anomaly, and to attempt to clarify the ambiguity concerning the dip of the structure. Multiple spacing IP should be read on Lines 28W, 24W and 20W with a = 200 feet and n = 1, 2, 3 and 4 and having the current electrode first south of the potential electrodes and then rereading with the current electrode north of the potential electrodes. This should remove any ambiguity as to drill hole location. The anomaly should then be considered with others occurring on the known ultrabasic body when drilling priorities are determined.

The work recommended above would entail expenditures of about $30,000.00.

A subsequent testing program of drilling and possibly trenching will be recommended. Two drilling targets are known at present on the original claim block and it is likely that further targets will emerge subsequent to future geophysics. It would be reasonable to anticipate a $50,000.00 requirement for drilling, trenching, sampling and supervision as a second phase of the programme.

Respectfully submitted,

BARRINGER RESEARCH LIMITED

REGISTERED PROFESSIONAL ENGINEER
M. L. HALLADAY
PROVINCE OF ONTARIO

M. L. Halladay, P. Eng., F.G.A.C.
Senior Geologist

REGISTERED PROFESSIONAL ENGINEER
F. L. JAGODITS
PROVINCE OF ONTARIO

F.L. Jagodits, P. Eng.
Chief Geophysicist

7. REFERENCES

1. Cameron, E.M., Siddeley, G., Durham, C.C.: "Distribution of Ore Elements in Rocks for Evaluating Ore Potential: Nickel, Copper and Sulphur in Ultramafic Rocks of the Canadian Shield" CIMM Special Vol. II.

2. Carlson, H.D.: "Ogden, Deloro and Shaw Townships", Ontario Department of Mines - Open File Report 5012.

3. Carlson, H.D. (1966): "Shaw Township" Preliminary Geological Map P 343 of the Ontario Department of Mines.

4. Middleton, R.S. (1972): "Report on the Pac Exploration Limited Property, Shaw Township, Porcupine Mining Division", Barringer Research Report.

5. Pyke, D.R., Middleton, R.S. (1970): "Distribution of Characteristics of the Sulphide Ores of the Timmins Area". Ontario Department of Mines, Misc. Paper 41.

6. Pyke, D.R.: "Geology of Langmuir Blackstock" Open File Report 5027.

APPENDIX II

COST ESTIMATES

PHASE I

Staking 20 claims		$1,200.00
Line cutting (19 miles @ $100.00 plus limited mobilization)		$2,000.00
GEOPHYSICAL SURVEYS:		
INDUCED POLARIZATION:-		
- 21 miles reconnaissance and detail. Estimate 32 days @ $380.00/day	$12,160.00	
- 8 days standby time @ $325.00/day	$ 2,600.00	
- 2 days standby @ $275.00/day	$ 550.00	
- Mobilization and demobilization	$ 700.00	$16,010.00
MAGNETOMETER:-		
- 19 miles reconnaissance and 5 miles detail @ $60.00/mile		$ 1,440.00
Geochemical sampling and analysis		$ 250.00
Geological survey and report (26 days) plus helper and accommodation		$ 5,000.00
Assaying and petrography		$ 550.00
Draughting		$ 400.00
		$26,850.00
10% Contingency		2,685.00
		$29,535.00
Say		$30,000.00

PHASE II

Drilling (6 holes of 500 ft. @ 12.50 ft.)		$37,500.00
Trenching		2,500.00
Sampling and geological supervision		5,000.00
		$45,000.00
	Contingency	4,500.00
		$49,500.00
	Say	$50,000.00

900

GEOPHYSICAL – GEOLOG
TECHNICAL DATA STATEMENT

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey: Induced Polarization - Magnetic - Geology

Township or Area: ~~Shaw Twp.~~

Claim holder(s): Pac. Explorations Ltd.,
Ste. 203, 350 Bay St., Toronto

Author of Report: M. Halladay - F. T. Jagodits

Address: ~~304 Carlingview Drive, Rexdale, ont.~~

Covering Dates of Survey: August 28 - Nov. 23/72.
(linecutting to office)

Total Miles of Line cut: 9.16

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

	DAYS per claim
Geophysical	
–Electromagnetic	
–Magnetometer	40
–Radiometric	
–Other IP	20
Geological	20
Geochemical	

see "Man-days" breakdown of

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

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

DATE: _____ SIGNATURE: _____
Author of Report

MINING CLAIMS TRAVERSED
List numerically

P (prefix)	(number)
P	333251
	333252
	333253
	333254
	333255
	333256
	333257
	333258
	333720
	333721

If space insufficient, attach list

TOTAL CLAIMS 10

OFFICE USE ONLY

PROJECTS SECTION

Halladay: this file

Res. Geol. _____ Qualifications Jagodits: 2.5

Previous Surveys 63.2963 NOT for assessment Credits 63.1217 done in 1963
different instrument 63.154 L.D.

Checked by _____ date _____

GEOLOGICAL BRANCH

Approved by _____ date _____

GEOLOGICAL BRANCH

Approved by _____ date _____

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations Magnetic 666 IP 237 Number of Readings ~~666-237~~

Station interval 100'

Line spacing 400'

Profile scale or Contour intervals ~~Magnetic 100γ Chargeability 1 Millisec Resistivity 100 ohm metres~~
(specify for each type of survey)
Normalized chargeability 100 farads/metres

MAGNETIC

Instrument Sharpe MF1 - McPhar M700

Accuracy - Scale constant MF1 - 20γ/Scale div. M700 - 20γ/Scale division

Diurnal correction method Assume Linear Change Between Base Readings

Base station location BL 5W BL 8W BL 12W BL 16W BL 20W BL 28W

ELECTROMAGNETIC

Instrument

Coil configuration

Coil separation

Accuracy

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

Frequency
(specify V.L.F. station)

Parameters measured

GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

INDUCED POLARIZATION – RESISTIVITY

Instrument Huntec 7.5 KW Trans - Crone Newmont Mark IV Rec.

Time domain Yes Frequency domain

Frequency Range

Power 7.5 KW

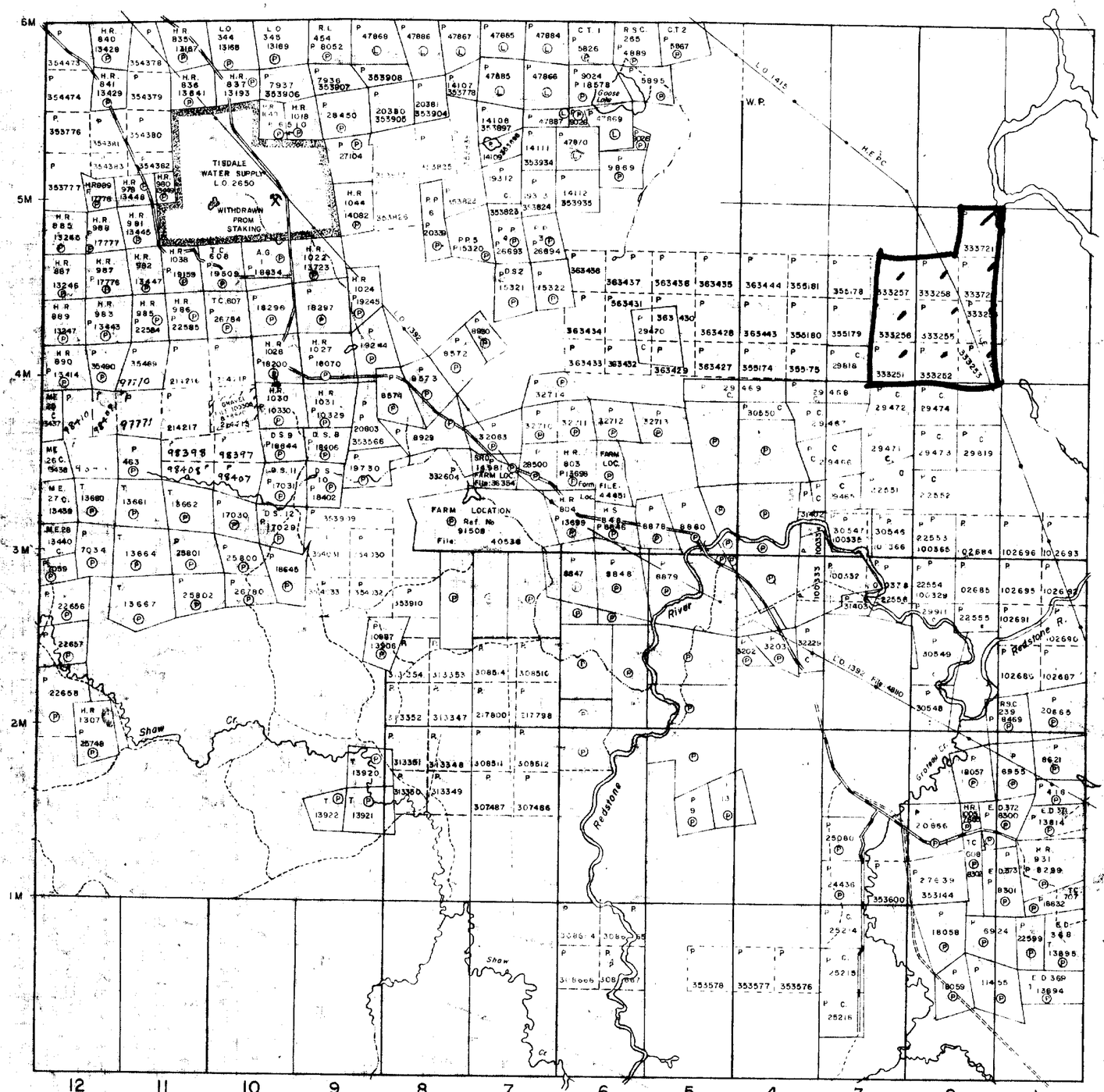
Electrode array Pole - Dipole

Electrode spacing 200'

Type of electrode ~~Steel & Porous Pots~~

2.1142

Whitney Twp. (M. 319)



Deloro Twp. (M.272)

Carman Twp. (M.266)

Eldorado Twp. (M. 276)

THE TOWNSHIP OF

SHAW

DISTRICT OF COCHRANE

PORCUPINE MINING DIVISION

SCALE: 1-INCH=40 CHAINS

LEGEND

PATENTED LAND	P
CROWN LAND SALE	C.S.
LEASES	L
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	
CANCELLED	C.

NOTES

400' Surface Rights Reservation around all Lakes and Rivers.

Unpatented Mining Claims in The Subdivided Portion of Shaw Twp are Subject to Section 118 of The Mining Act" Dept of Mines File No. 83.5

MINING LANDS
DATE OF ISSUE
FEB 6 1973
MINISTRY OF NATURAL RESOURCES

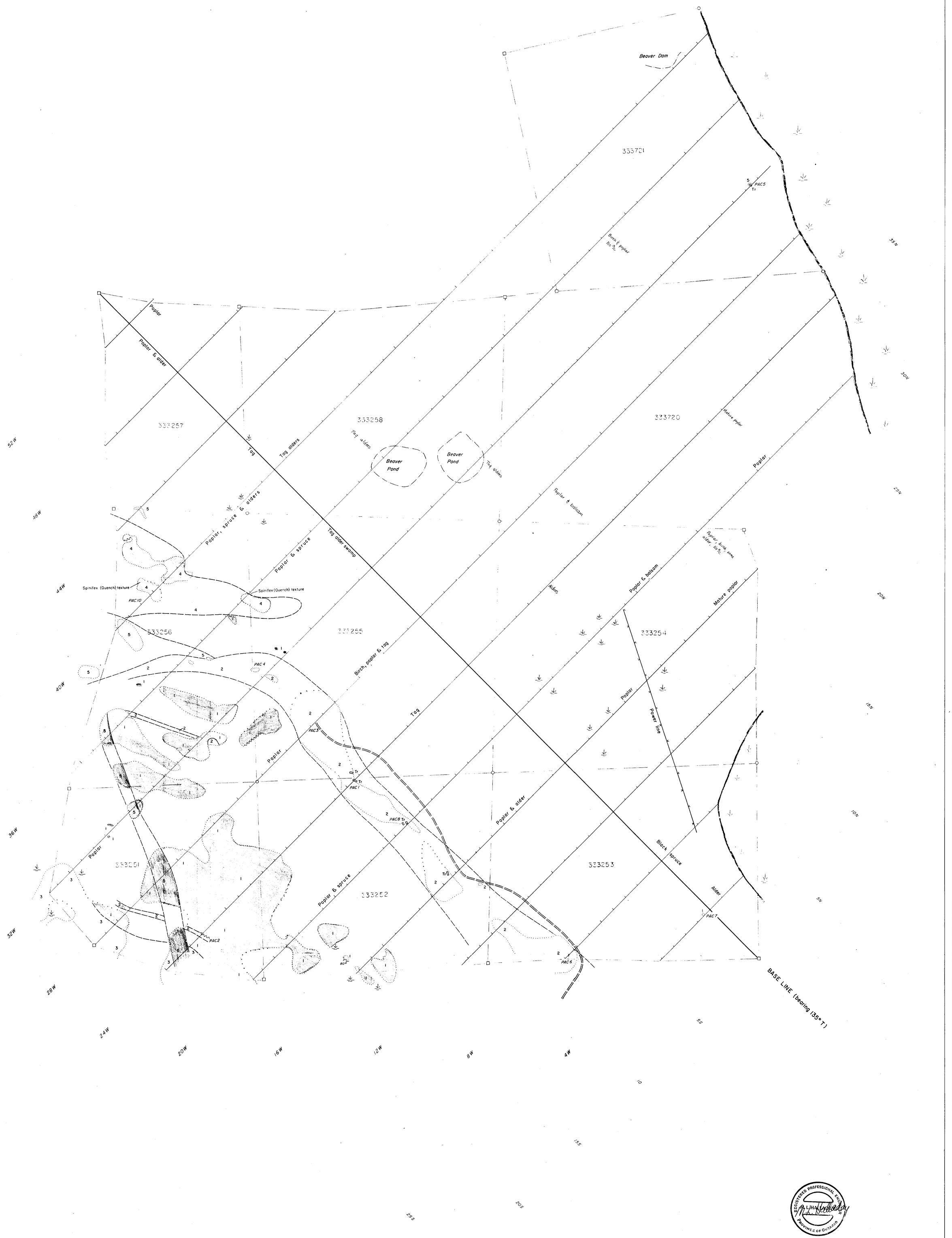
PLAN NO. M.311

ONTARIO

MINISTRY OF NATURAL RESOURCES

SURVEYS AND MAPPING BRANCH

200 equivocal



LEGEND

LATER INTRUSIVES
- 6 Olivine Diabase (Keweenawan ?)
- 5 Quartz diorite

ARCHAEAN
- INTRUSIVES
  - 4 Ultramafic sill (or possibly a flow)
  - 3 Feldspar porphyry (dacitic sill or flow)
- EXTRUSIVES
  - 2 Sedimentary Iron Formation (mainly chert jaspillite phase)
  - 1 Andesite (vessicular, dacitic in appearance)

Outcrop boundary, observed, assumed

Geological contact, observed, assumed

Fault

Trench — Tr

Sample or specimen number — PAC 4

Claim post, located, unlocated — □ ○

Swamp

Geology by M. Hallady, P. Eng.
from Sept. 28 to Oct. 5 1972

Work undertaken by
BARRINGER RESEARCH LTD., Toronto, Canada

REGISTERED PROFESSIONAL ENGINEER
M. L. HALLADY
PROVINCE OF ONTARIO

N

12A06NE0329 2.1142 SHAW

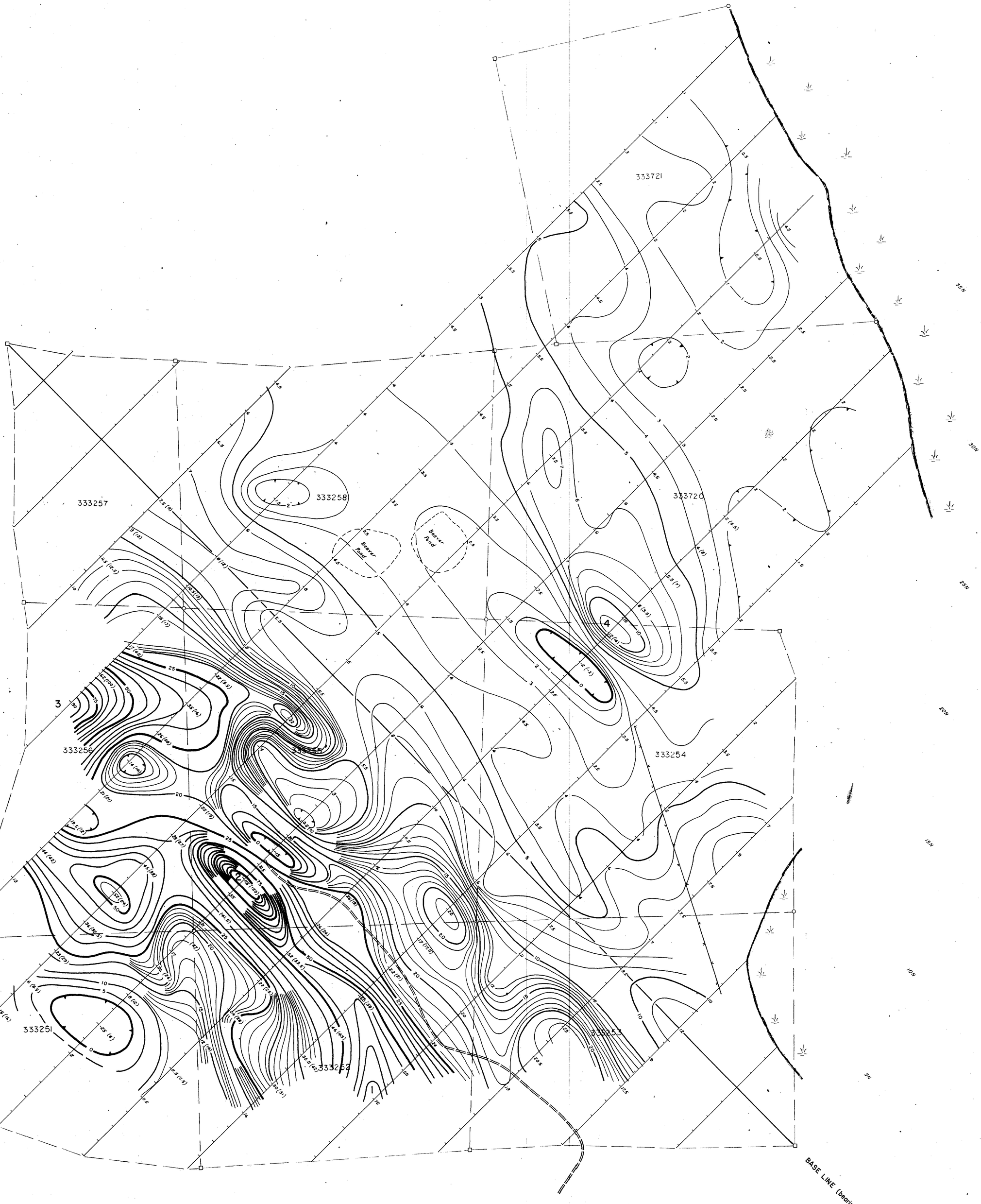
210

PAC EXPLORATIONS LIMITED

SHAW TOWNSHIP, PORCUPINE M.D., ONTARIO

GEOLOGY

NOV. 1972	Scale 1" = 200'	DWG. 5-325-2



N

—A—

ELECTRODE CONFIGURATION

Plotting point

Note: Figures in brackets are n = 3

LEGEND

Contour interval _____ 1 millisec
25 millisec contour _____
5 millisec contour _____
1 millisec contour _____
Depression _____
Claim post, located, unlocated __ □ ○

Work undertaken by:
BARRINGER RESEARCH LTD, Toronto, Canada

F. L. MATORITS

PAC EXPLORATIONS LIMITED

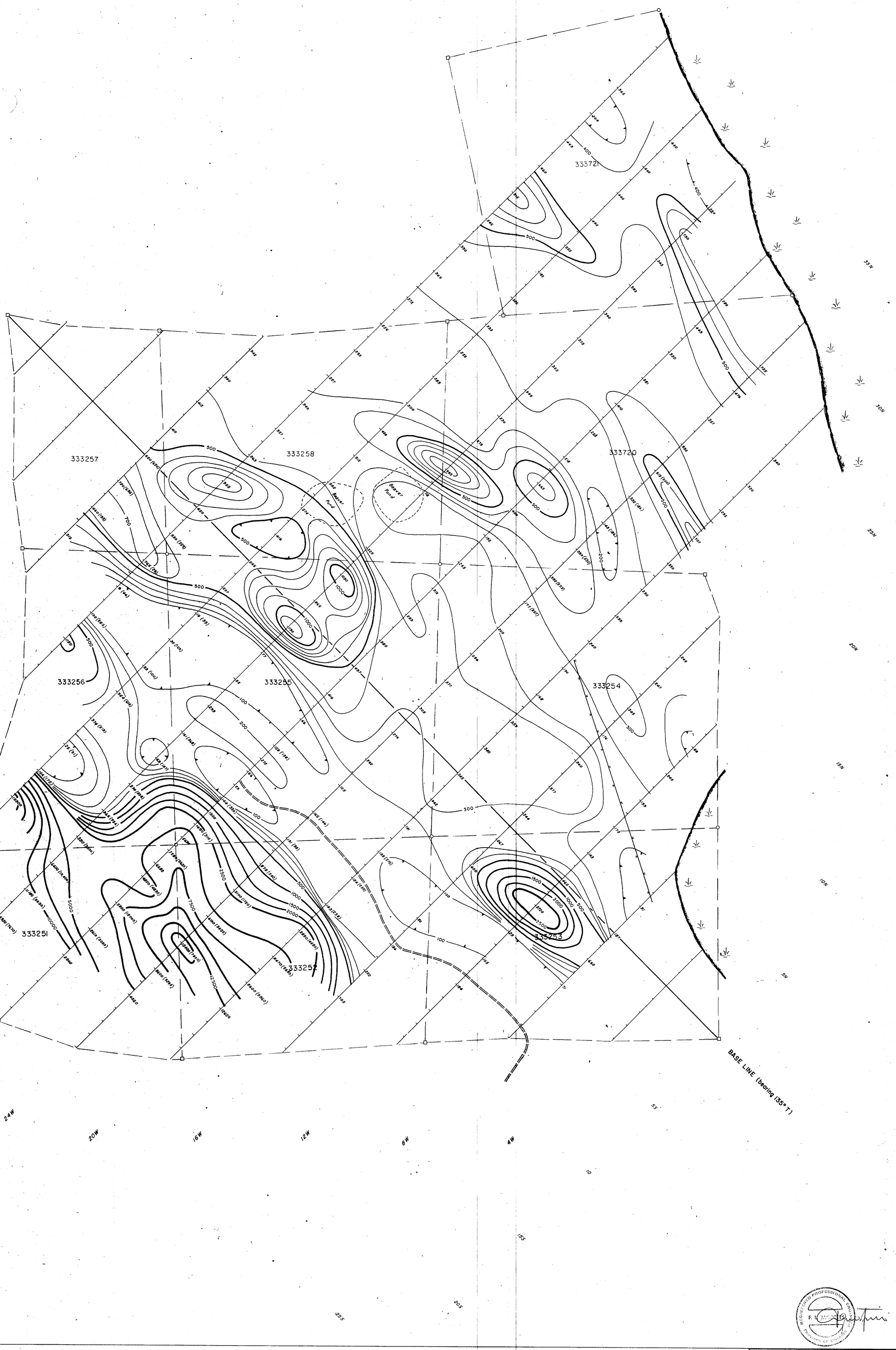
SHAW TOWNSHIP, PORCUPINE M.D., ONTARIO

CHARGEABILITY CONTOURS
a = 200' n = 2

NOV. 1972 | Scale 1" = 200' | DWG. 5-325-3

42A8GNE0328 2.11142 SHAW

220



N

ELECTRODE CONFIGURATION

Figures in brackets are n=3

LEGEND

Contour interval ..... 100 Ohm-metres
2500 Ohm-metre contour
500 Ohm-metre contour
100 Ohm-metre contour
Depression
Claim post, located, unlocated

Work undertaken by:
BARRINGER RESEARCH LTD., Toronto, Canada

PAC EXPLORATIONS LIMITED

SHAW TOWNSHIP, PORCUPINE M.D., ONTARIO

APPARENT RESISTIVITY CONTOURS
a = 200' n = 2

NOV. 1972 | Scale 1" = 200' | DWG. 5-325-4

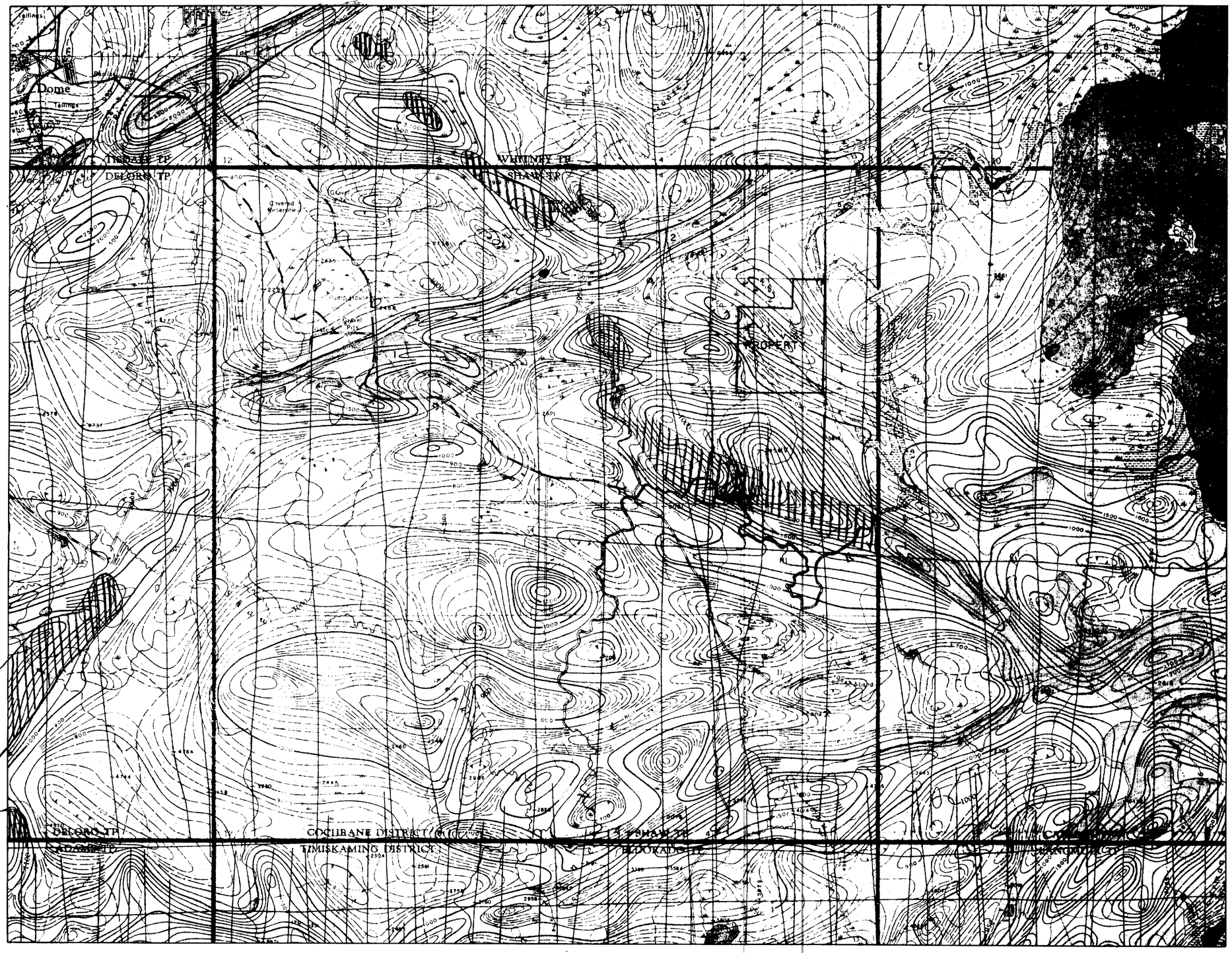
42A06NE0320 2.1142 SHAW

230

81°10'

81°05'

48°25'



81°10'

81°05'

48°25'

NOTE:
Magnetics from Dept. of Energy, Mines and Resources. Map 84486
— Sheet 42A/6 East Half - Timmins -

N

—A—

42A06NE0328 2.1142 SHAW

240

LEGEND

1 Ultramafic Rocks (mapped)

2 Diabase Dykes

1a Ultramafic Rocks from ODM map 4629:-
exact outline & continuity partly inferred

REGISTERED PROFESSIONAL ENGINEER
M. L. HALLADAY
PROVINCE OF ONTARIO

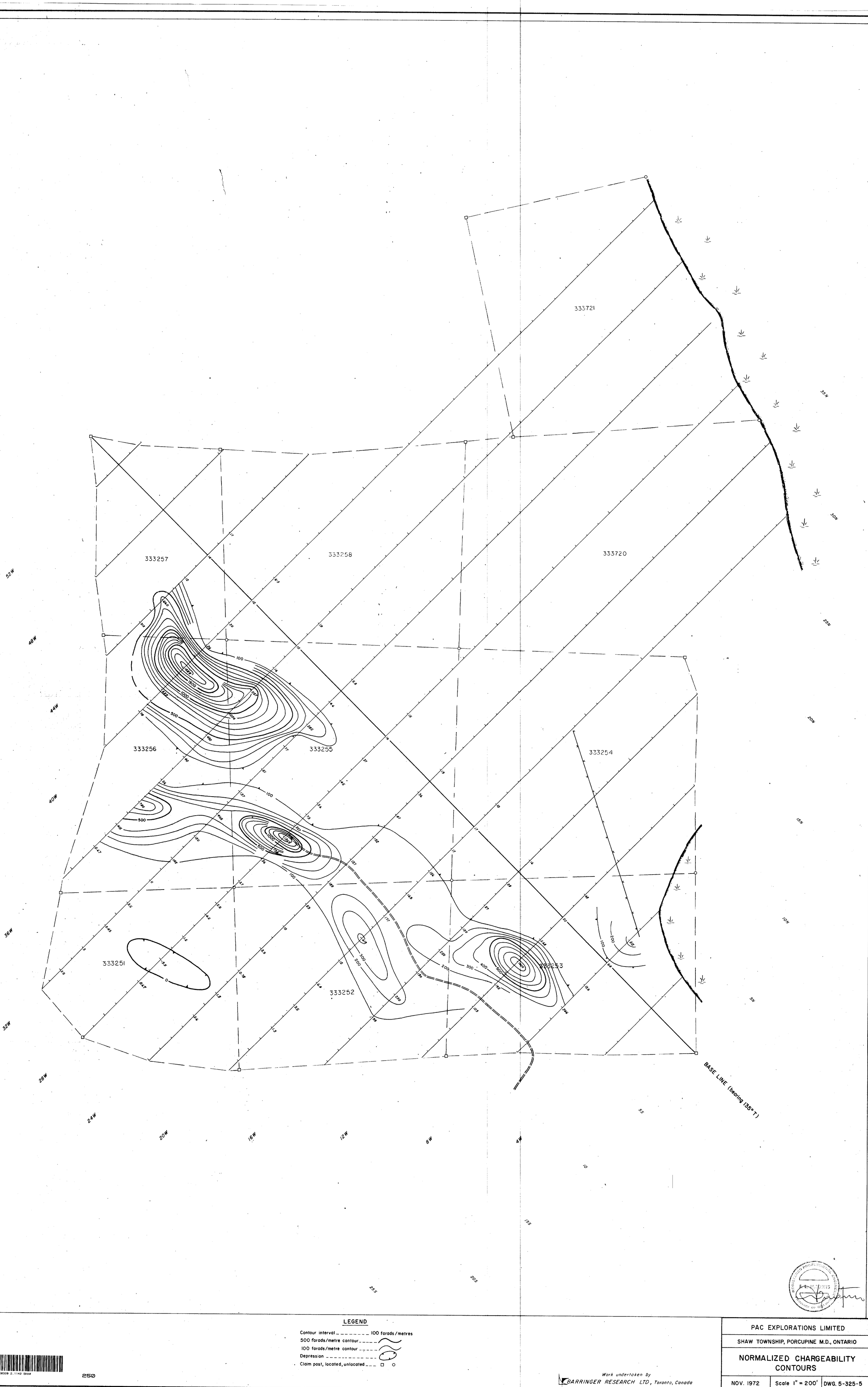
Work undertaken by
BARRINGER RESEARCH LTD, Toronto, Canada.

PAC EXPLORATIONS LIMITED

SHAW TOWNSHIP, PORCUPINE M.D., ONTARIO

MAP SHOWING RELATIONSHIP BETWEEN
AIRBORNE MAGNETIC CONTOURS
& ULTRAMAFIC ROCKS

NOV. 1972	Scale 1" = 1/2 Mile	DWG. 5-325-7



N

LEGEND

Contour interval _____ 100 farads/metres
500 farads/metre contour _____
100 farads/metre contour _____
Depression _____
Claim post, located, unlocated ___ □ ○

250

Work undertaken by
BARRINGER RESEARCH LTD, Toronto, Canada

PAC EXPLORATIONS LIMITED

SHAW TOWNSHIP, PORCUPINE M.D., ONTARIO

NORMALIZED CHARGEABILITY CONTOURS

NOV. 1972	Scale 1" = 200'	DWG. 5-325-5

LEGEND

Contour interval _____ 100 gammas
2500 gamma contour _____
500 gamma contour _____
100 gamma contour _____
Depression _____
Claim post, located, unlocated ___ □ ○

Work undertaken by
HARRINGER RESEARCH LTD., Toronto, Canada

F. L. JACOBITS
REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

PAC EXPLORATIONS LIMITED

SHAW TOWNSHIP, PORCUPINE M.D., ONTARIO

VERTICAL FIELD MAGNETICS

NOV. 1972	Scale 1" = 200'	DWG. 5-325-6

260