

42A155W0017 2.1704 MANN

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PROJECTS UNIT.

GEOPHYSICAL SURVEY

on the

MANN #1 GROUP

Hollinger Mines Limited
Mann Township, Ontario

H.Z. Tittley, P.Eng.

Timmins, Ontario
February 3, 1975

INTRODUCTION

During November 1974 a V.L.F. electromagnetic (20KHz E.M.) survey was executed over a group of 14 claims situated in Mann Township northeast of Timmins, Ontario.

Several conductors were mapped, three of which are interpreted as bedrock features.

PROPERTY, LOCATION and ACCESS

The group consists of 14 unpatented mining claims held by Hollinger Mines Limited under option from Mr. Ty Randa of Cochrane, Ontario. They are numbered P-326390 to P-326403 inclusive and occupy the north $\frac{1}{2}$ of lots 3 and 4, the west $\frac{1}{2}$ of the south $\frac{1}{2}$ of lot 3, the east $\frac{1}{2}$ of the south $\frac{1}{2}$ of lot 4 and the east $\frac{1}{2}$ of the north $\frac{1}{2}$ of lot 5, all in the fifth concession of Mann Township, in the Porcupine Mining Division.

The property, located 13 miles south of Cochrane, is readily accessible via highway 11 and a winter haulage road that extends along the north boundary of the claims.

PREVIOUS WORK

Previous work on the group that has been filed for assessment credits with the Ministry of Natural Resources was performed by the following companies: Dominion Gulf Company, 1951; Torbit Silver Mines Limited, 1965; Noranda Mines Limited, 1973; Hollinger Mines Limited, 1974.

Work filed is the following:

- Magnetic surveys, vertical field;
- Magnetic survey, total field;
- Electromagnetic survey, broadside method;
- Electromagnetic surveys, fan method;
- Geological survey;
- Diamond drilling.

GENERAL GEOLOGY

This portion of Mann Township is a relatively flat wooded plain underlain by stratified clays (Barlow-Ojibway formation) 20 to 200 feet thick overlying mainly basic archean flows. Felsic volcanics with related graphitic tuffs have been encountered in the drilling, but like elsewhere in the township, these appear to be associated with the margins of the ultramafic intrusives that can display thicknesses of between 100 feet and 2000 feet or more. Such intrusives occur near the creek in the south part and in the northeast corner of the group.

ELECTROMAGNETIC SURVEY

Along an existing grid of picket lines, bearing 110°, the electromagnetic survey was conducted by two operators employing two EM-16 electromagnetic receivers manufactured by Geonics Limited of Toronto. A modification to the wiring of these units permits that the "out-of-phase" component will have the same sign as that of the inclinometer (calibrated in %) when traversing over a buried non-magnetic conductive source.

A total of 13 miles were read at intervals of 100 feet or less along lines 400 feet apart.

RESULTS

The results of the electromagnetic survey are presented in profile form on the accompanying plan entitled '20 KHz EM' at a scale of 1 inch to 200 feet. The only anomalies interpreted as being worthy of further consideration are labelled 'A' to 'E' on the plan.

Anomaly 'A' was intersected in a drill hole and found to be caused mainly by a graphite zone adjacent to cupriferous and nickeliferous sulphides.

Anomalies 'B' and 'C' are directly associated with the south contact of a northerly dipping ultramafic body mapped by the ground magnetics. Serpentinization of the ultramafics might account for these conductors.

Anomaly 'D' may not reflect a bedrock source, but it correlates with weak vertical loop electromagnetic responses.

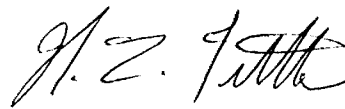
Anomaly 'E', although a low priority response with the EM-16, coincides with a definite bedrock conductor mapped with horizontal loop gear.

CONCLUSIONS and RECOMMENDATIONS

Despite the wide separation of the lines, the electromagnetic survey successfully detected the known conductors on the property.

The remaining V.L.F. anomalies, especially 'B' and 'D', should be checked using the horizontal loop method with a coil separation of 400 feet.

Respectfully submitted,



H.Z. Tittley, P.Eng



FEB 06 1975

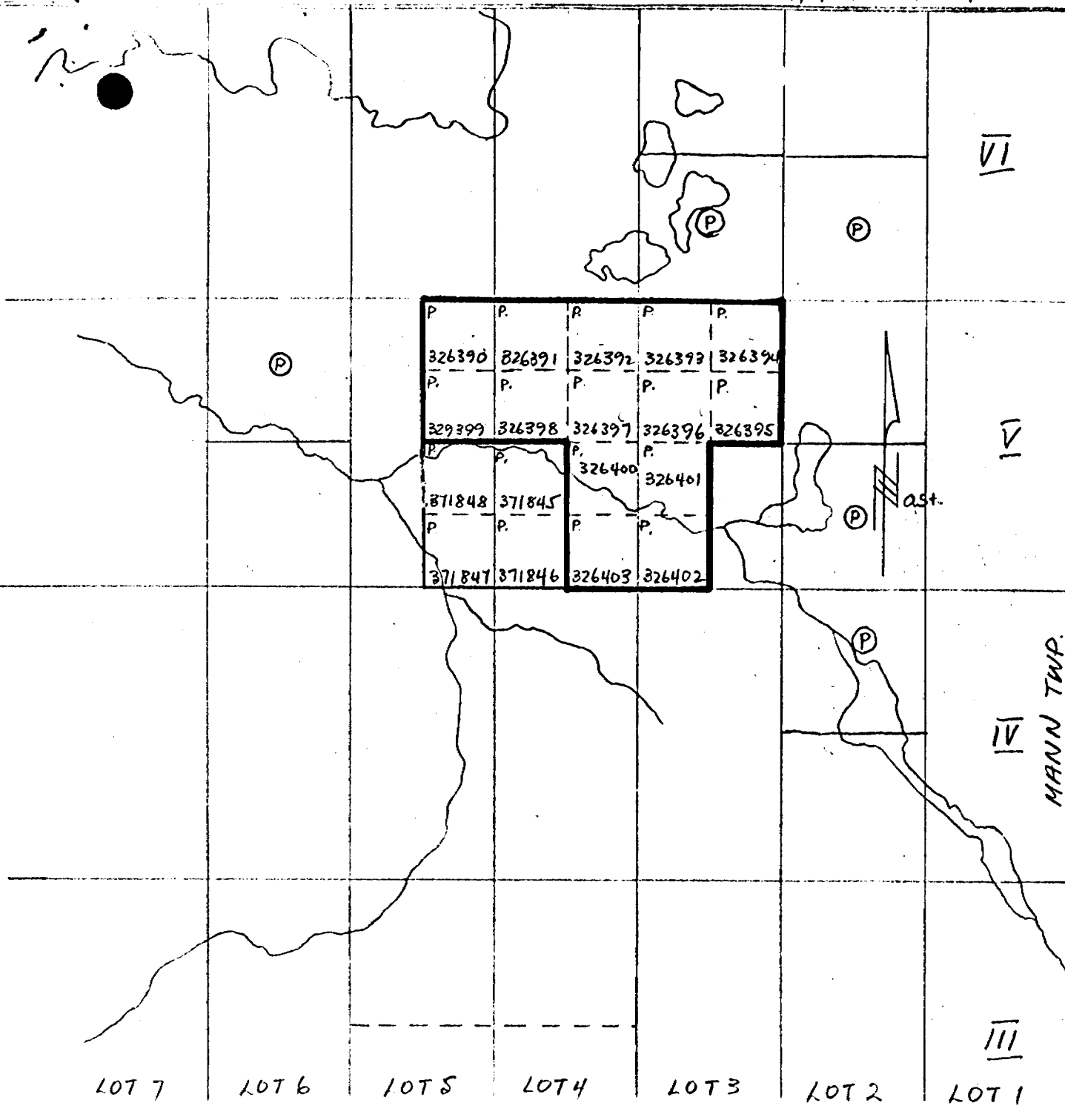
December 13, 1974.

PROJECTS UNIT.

Statement showing distribution of Assessment Days
as a result of a Geological Survey on Mann #1 Group,
Mann Township, performed November 18 to December 13,
1974.

<u>Claim Number</u>	<u>Assessment Days</u>
P-326390	20
326391	20
326392	20
326393	20
326394	20
326395	20
326396	20
326397	20
326398	20
326399	20
326400	20
326401	20
326402	20
326403	20
Total	<u>280 days</u>

W. H. Hansen
MOLLINGEN LIMITED
TIMMINS, ONTARIO



Tract #1 Group
 SCALE: 1" TO 2640'



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FEB 06 1975

PROJECTS UNIT.

GEOLOGICAL SURVEY

MANN #1 GROUP (RANDA OPTION)

Hollinger Mines Limited

January 10, 1975

VI

V

IV

III

MANN TWP.
NEW MARKET TWP.

P	P.	P.	P. // // //	P.
326398	326391	326392	326393	326394
P.	P.	P.	P.	P.
329399	326398	326397	326396	326395
P.	P.	P.	P.	P.
871848	371845	326400	326401	
P.	P.	P.	P.	
371847	371846	326403	326402	



LOT 7 LOT 6 LOTS LOT 4 LOT 3 LOT 2 LOT 1

Scale - 1" = 2640'

Mann #1 Group

Claim Map and Location of Properties
Having Filed Previous Work

- Dominion Sulph // // //
- Torbrit Silver —————
- Cromarty —————

Geological Survey
Mann #1 Group (Randa Option)
Hollinger Mines Limited

INTRODUCTION

In the latter part of November 1974, a geological survey, in conjunction with a VLF electromagnetic survey, was conducted over the Randa Option (Mann #1 Group), in Mann Township.

This group consists of eighteen contiguous, un-patented mining claims, located about 35 miles northeast of Timmins in the central, northeastern part of Mann Township. The eighteen claims include numbers 326390-6403 incl.; and 371845-848 incl., occupying the east half of lot 5, concession V; all of lot 4, concession V; the west half of lot 3, concession V and the east half of lot 3, in the north half of concession V, Mann Township.

Access to the property is quite convenient via Highways 101 and 11 to Potter, a distance of some 60 miles. From Potter, a swamp road extends further west, traversing the northern part of the group within 5 or 6 miles. In winter, the swamp road is passable by most types of transport, while during the remainder of the year an all-terrain type vehicle is necessary.

TOPOGRAPHY

The property is effectively contained within a topographic high resulting from a north-northwesterly trending esker complex, that is partially traceable for long distances north and south. There is a marked topographic relief at the eastern edge of the property where open, boggy ground is adjacent to the esker. West, and south across the group, there is a gradual decrease in the elevation of the land, the only exception to this being where Devonshire Creek cuts through the esker, producing up to twenty feet of relief.

Variations in types of vegetation are quite easily delimited throughout the property. The northern part of the group, plus a narrow area marginal to the creek, supports a mixture of poplars and alders with occasional birch, spruce or fir growth. Although the change to spruce swamp type vegetation is quite notable, the difference in elevation is not appreciable. Further west, along the sections of spruce swamp, growth becomes much sparser, and is more aptly designated as spruce muskeg.

PREVIOUS WORK

In the past, several companies have worked on parts of the claim group; the history of the area dating back to the mid-forties.

In 1951, Dominion Gulf acquired four claims, and performed a magnetic survey over the ultrabasic in the northeast corner of the present property. Based on the results of that survey, one hole was drilled, encountering a mass of dunite and serpentinized dunite. More complete descriptions of the rock types are included under general geology.

In 1965, Torbrit Silver Mines Limited performed electromagnetic surveys on their 26 claim group, which includes part of the present property. Both Sharpe's SE-200, and VEM surveys were carried out over a grid spacing of 800 feet, with later, detail work being done in areas with anomalous responses. There was some interference in the readings and several of the plots were hashy; however, one anomaly was outlined, and drilled, in the central portion of the group. The drill hole intersected andesitic volcanics with two narrow bands of graphitic tuff, and a twenty foot dyke of feldspar porphyry. Scattered amounts of sulphides occur throughout the hole - mostly pyrrhotite, with lesser pyrite and chalcopyrite. One section, from 92 to 114, averaged 7 percent sulphides, assaying .12% Cu; .25% Ni.

In 1968, Cromarty Exploration held a large sixty claim group - the northern extent of which incorporated all of the

present property. Two holes were drilled about a mile and a half south of the Torbrit hole. In the first hole, the electromagnetic conductor was attributed to a 51 foot horizon of banded argillite-graphitic tuff with several en echelon bands of pyrrhotite. The graphitic section is surrounded by volcanic rocks - both andesites and rhyolites, that are variably bleached, silicified and chloritized. This hole bottoms in granite porphyry with erratic patches of absorbed volcanic material. Aside from the pyrrhotite, trace amounts of pyrite, chalcopyrite and molybdenite were noted in this hole.

A second hole, drilled a little further south, intersected extensive widths of both granite and peridotite. Contacts between the two rock types show appreciable widths of hybrid material - generally granite with absorbed serpentine and alteration.

The original fourteen claims of the present group (i.e. numbers 326390-6403 incl.) were earlier optioned to Noranda Exploration in 1972. At that time, Noranda completed magnetic and electromagnetic surveys using a McPhar M-700 fluxgate magnetometer and a Crone VEM unit. The fluxgate survey, more closely defines the ultramafic body in the northeast corner of the group, plus a second, 2000 gamma anomaly in the south central portion of the claims. Further, the VEM survey outlines more clearly the electromagnetic conductor drilled by Torbrit Mines, which correlates with a weaker 500 gamma magnetic anomaly of similar trend.

Since the property was optioned to Noranda, four new claims have been added to the southwest corner of the group. A later magnetic survey on these new claims indicates two magnetic anomalies, possibly separated by an east-northeasterly trending fault zone.

GENERAL GEOLOGY

Within the limits of the property there are no rock exposures; however, previous diamond drilling records provide a general basis for discussing lithologies.

The oldest rocks in the area are a sequence of extrusive volcanics, varying in composition from andesite to rhyolite with some interbedded graphitic material. Individual units within the volcanic sequence are often less than forty feet in width; the tops of units being characterized by irregular bands of cherty to silicified flow material. This is particularly true of the andesites.

The andesite itself is dark grey to dark green in colour, variably carbonitized and occasionally vesicular in nature. Sulphide content is quite erratic, with up to 20 percent pyrite-pyrrhotite occurring in blebs and narrow bands at random along the core. Although it is not always the case, the cherty to silicified flow top material is generally barren to sparsely mineralized.

The rhyolitic member has not been encountered on the present property under consideration, but several narrow bands were intersected in the Cromarty drilling, approximately one mile further south. Here, the rhyolite is described as being fine grained, hard, bleached and silicified; varying in colour from light grey to light green and occasionally dark grey, due to the amount of chlorite present. As noted in the andesites, the rhyolites are erratically mineralized with up to 20 percent pyrrhotite-pyrite.

The graphitic material has been alternately described as argillite, but due to the numerous interbeds of both acid and basic volcanics, plus some tuff sediment, the unit is probably best designated as graphitic tuff. These rocks are typically banded and contorted, often with a fair amount of sulphides occurring either in fine disseminations or numerous en echelon bands.

Intruding the older volcanics is a widespread zone of ultramafics that occupy most of the southeast and northwest portions of Mann Township; in fact, the property is nearly enveloped by these rocks. The ultramafics are sill-like in form and may possibly be interpreted as one large, layered body which has undergone several phases of intrusion. Scattered, smaller bodies of ultramafics also occur across the township, and may be contemporaneous with the sill, only having suffered a different mode of intrusion. Within the sills some differentiation has been noted from dunite, to pyroxenite and peridotite plus some associated gabbro and granophyric gabbro.

The magnetic anomaly in the northeastern portion of the property is the northern expression of the ultramafic sill. Here the rock is a well altered, serpentized dunite which is mottled in appearance due to a well developed talc-chlorite mat that fills interstices between blebs of serpentine. Stringers and disseminations of magnetite are found throughout the core, plus there is some development of picrolite along slip planes. Several white-green, talcose, alteration zones also occur within this unit.

Near the southern extremity of the previous Cromarty group is the contact between the volcanics (to the north), and the southern continuation of the ultramafic sill. Here, one hole intersected a mixed sequence of blue-green serpentized peridotite and granite. The younger granitic intrusive has partially absorbed some of the serpentine, creating a series of hybrid rocks near contacts between the two units.

The youngest rocks on the property are felsic intrusives, ranging in composition from granite to feldspar porphyry. The porphyry is grey, medium to coarse grained with white phenocrysts of feldspar to an eighth of an inch in size. The widest sequence of granite intrudes the ultrabasic complex on the southern part of the Cromarty property. The unaltered portions of the granite are medium to coarse grained and pink to grey in colour.

STRUCTURE

The property is situated along a major, easterly trending, overturned anticline; the axis of which is interpreted to pass through the south-central part of the group. Since the sill-like ultramafic intrusives are themselves folded, and there is no indication that the felsic intrusives are similarly affected, this folding phase may occur previous to, or synchronous with the Algoman Orogenic Era. There is a magnetic (ultramafic?) body, however, which appears to trace the projection of this fold axis on the property and may narrow the period of folding to coincide with a late phase of ultramafic intrusions.

Over most of the Timmins area there is an imprint of a second, northerly trending, phase of folding, and, although there is no conclusive evidence to support this here, the overturning in the major anticlinal axis may be accomplished by a refolding mechanism.

Faulting, in Mann Township, has occurred in three major phases; a northerly trending phase, plus a northeasterly and a northwesterly phase. A sense of symmetry between the three elements suggests that all of the structures may have occurred in the same stress system. Of the three phases, the northeasterly set predominates in strength and number; however, no definite offsets of other fault planes are recognizable, such that the exact age relationship between the three systems is unknown.

On the property, two phases of faulting can be determined in the southwest portion of the group. A northwesterly fault, which partially follows Devonshire Creek, has been plotted from the Preliminary Map of Mann Township and projects along an axis of low magnetics. Apparently, this northwest fault has been offset a small amount by a north-northeasterly trending structure which can be extrapolated along a second axis of low magnetics. This later fault also offsets a zone of late ultramafic intrusives which occur in this area. Further, in projecting this east-northeast fault, a slight change in trend is noted in the sill-like intrusive in the northeast corner of the property.

Thus the east-northeasterly phase of faulting is presumed to be the youngest structure on the property and may possibly postdate all three major systems in the area.

The resultant structural-depositional history is interpreted to proceed as:

Erosion and Glacial Deposition

-----Large Unconformity-----

Precambrian

Algoman felsic intrusives + Faulting(?)

Faulting(?)

Folding and late ultramafic intrusions

Early sill-like ultramafic intrusions

Extrusive volcanics - including:

rhyolite, andesite and graphitic tuffs.

ECONOMIC GEOLOGY

Several copper-nickel prospects of economic importance have been discovered in Mann Township. These prospects tend to occur consistently in the volcanics, at, or near the contact with the ultramafic intrusions. Unfortunately, to date, most of the discoveries have been small and generally of such low grade that development programmes were not warranted.

A second type of prospect, bearing copper, zinc and silver mineralization has been encountered on the Jonsmith property in the southern part of the township. Here, a 3000 foot long mineralized, conductive zone lies within rhyolitic pyroclastics and graphitic tuffs. Further, the Quebec Cobalt prospect in west central Mann Township possesses some copper-zinc mineralization in a graphitic rhyolite unit. Both of these properties, as before, are in close proximity of the ultramafic intrusives.

CONCLUSIONS

The Mann #1 Group would appear to contain most of the geological prerequisites for the type of copper-nickel prospect already found in the area. Some indications of mineralization are present on the property, promoting further investigation.

To date, electromagnetic surveys have been completed and partially compiled on the property. Recommendations could be made pending correlation of geological and geophysical data, with particular attention paid to anomalies associated with the ultramafic complexes.

January 10, 1975.

*

Qualifications

2.142

Dave W. Alexander
HOLLINGER MINES LIMITED
TIMMINS, ONTARIO

SELECTED BIBLIOGRAPHY

Bright, E.G. and Hunt, D.S.

1972: Mann Township; Ont. Div. of Mines;
Preliminary Map P.755; 1" = 1320'

Ontario Division of Mines - assessment files.

GEOPHYSICAL - GEOLOG
TECHNICAL DAT.



900

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 Geophysical Electromagnetic
Township or Area Mann Township
Claim holder(s) Hollinger Mines Limited
Box 320, Timmins, Ontario
Author of Report H. Z. Tittley, P.Eng.
Address Hollinger Mines Ltd., Box 320, Timmins, Ont.
Covering Dates of Survey Nov. 18, 1974 to Jan. 31, 1975
(linecutting to office)
Total Miles of Line cut 14.54

MINING CLAIMS TRAVERSED	
List numerically	
P -	326390
(prefix)	(number)
P -	326391
P -	326392
P -	326393
P -	326394
P -	326395
P -	326396
P -	326397
P -	326398
P -	326399
P -	326400
P -	326401
P -	326402
P -	326403
TOTAL CLAIMS <u>14</u>	

If space insufficient, attach list

SPECIAL PROVISIONS CREDITS REQUESTED	DAYS per claim
ENTER 40 days (includes line cutting) for first survey.	Geophysical - Electromagnetic <u>20</u>
ENTER 20 days for each additional survey using same grid.	- Magnetometer _____
	- Radiometric _____
	- Other _____
	Geological <u>20</u>
	Geochemical _____

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)
Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: _____ SIGNATURE: _____
Author of Report or Agent

PROJECTS SECTION
Res. Geol. _____ Qualifications 63.2513
Previous Surveys 2:1241 EM + Mag
- different instrument
- used same lines for this survey
Checked by _____
63.519 Mag Survey
GEOLOGICAL BRANCH _____
Approved by _____ date _____
GEOLOGICAL BRANCH LD
Approved by _____ date _____

OFFICE USE ONLY

Show instrument technical data in each space for
type of survey submitted or indicate "not applicable"

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS

Number of Stations 702 Number of Readings 702
Station interval 100 feet or less
Line spacing 400 feet
Profile scale or Contour intervals Profiles 1" = 20'
(specify for each type of survey)

MAGNETIC

Instrument _____
Accuracy - Scale constant _____
Diurnal correction method _____
Base station location _____

ELECTROMAGNETIC

Instrument Geonics EM-16
Coil configuration Receiver coil horizontal.
Coil separation Infinity
Accuracy Real $\pm 1\%$, Quadrature $\pm 1\%$
Method: Fixed transmitter Shoot back In line Parallel line
Frequency 17.8 KHz Station NAA Cutler Maine
(specify V.L.F. station)
Parameters measured In-phase and out-of-phase.

GRAVITY

Instrument _____
Scale constant _____
Corrections made _____
Base station value and location _____

Elevation accuracy _____

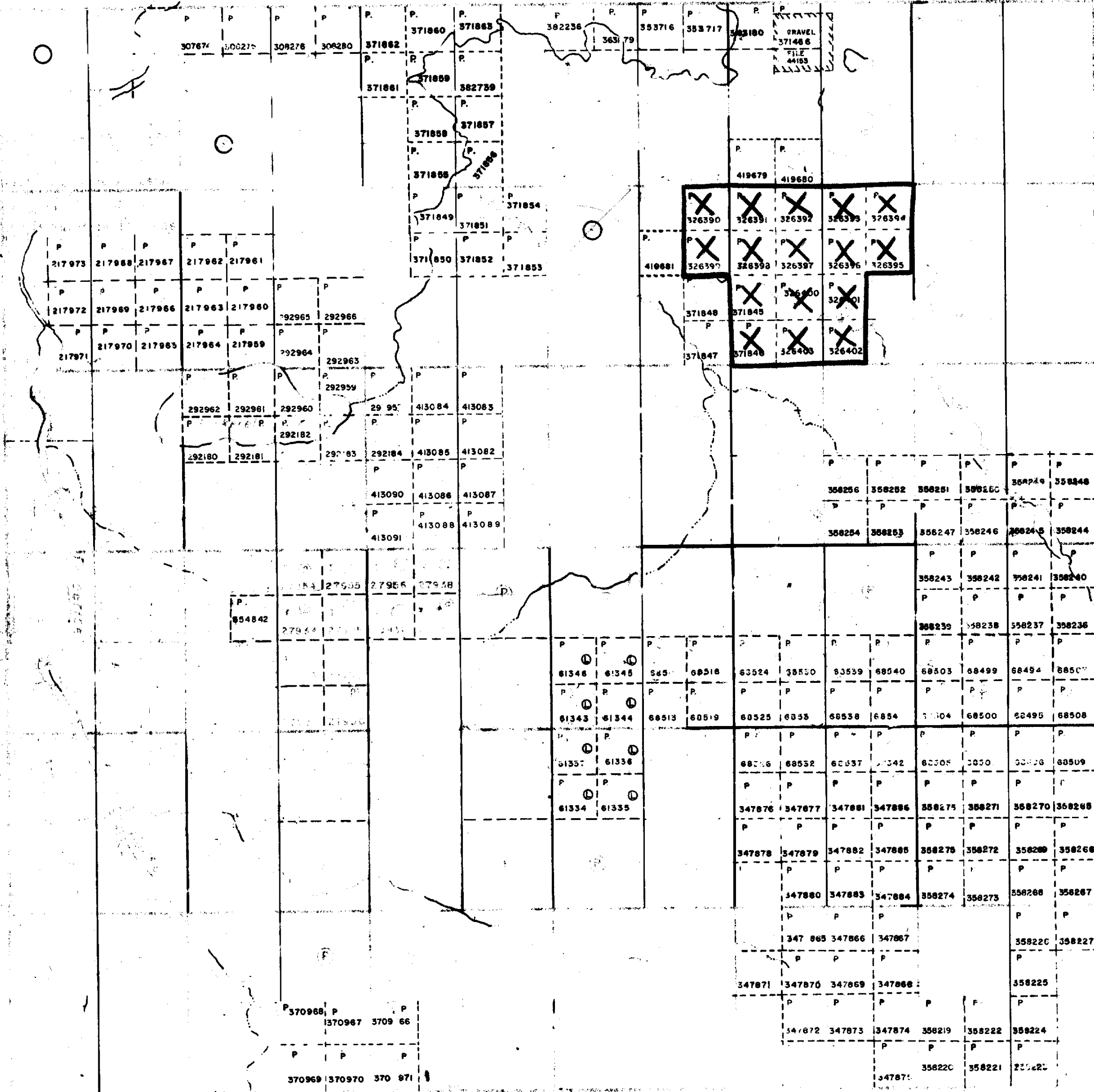
INDUCED POLARIZATION - RESISTIVITY

Instrument _____
Time domain _____ Frequency domain _____
Frequency _____ Range _____
Power _____
Electrode array _____
Electrode spacing _____
Type of electrode _____

142 M

142 M

THE TOWNSHIP OF **2.1704**



MANN
 DISTRICT OF COCHRANE
 MORDORINE
 DIVISION
 BRANCH 40 CHAIRS

LEGEND

[Symbol]	EXISTING ROAD	[Symbol]	MINING CLAIM
[Symbol]	PROPOSED ROAD	[Symbol]	UNCLASSED LAND
[Symbol]	ROAD	[Symbol]	PROPOSED MOUNTAIN PASS
[Symbol]	PROPOSED MOUNTAIN PASS	[Symbol]	PROPOSED MOUNTAIN PASS
[Symbol]	PROPOSED MOUNTAIN PASS	[Symbol]	PROPOSED MOUNTAIN PASS

NOTES

1. All surveys were conducted in accordance with the provisions of the Survey Act, R.S.O. 1990, Chapter S.5, and the Mining Act, R.S.O. 1990, Chapter M.4.

2. The accuracy of this map is guaranteed for all uses and purposes for which it was prepared.

3. This map is not intended to be used for any purpose other than that for which it was prepared.

- MINING LANDS -
DATE OF ISSUE
FEB - 7 1976
 MINISTRY OF NATURAL RESOURCES

MANN

Manning Twp.

MANN



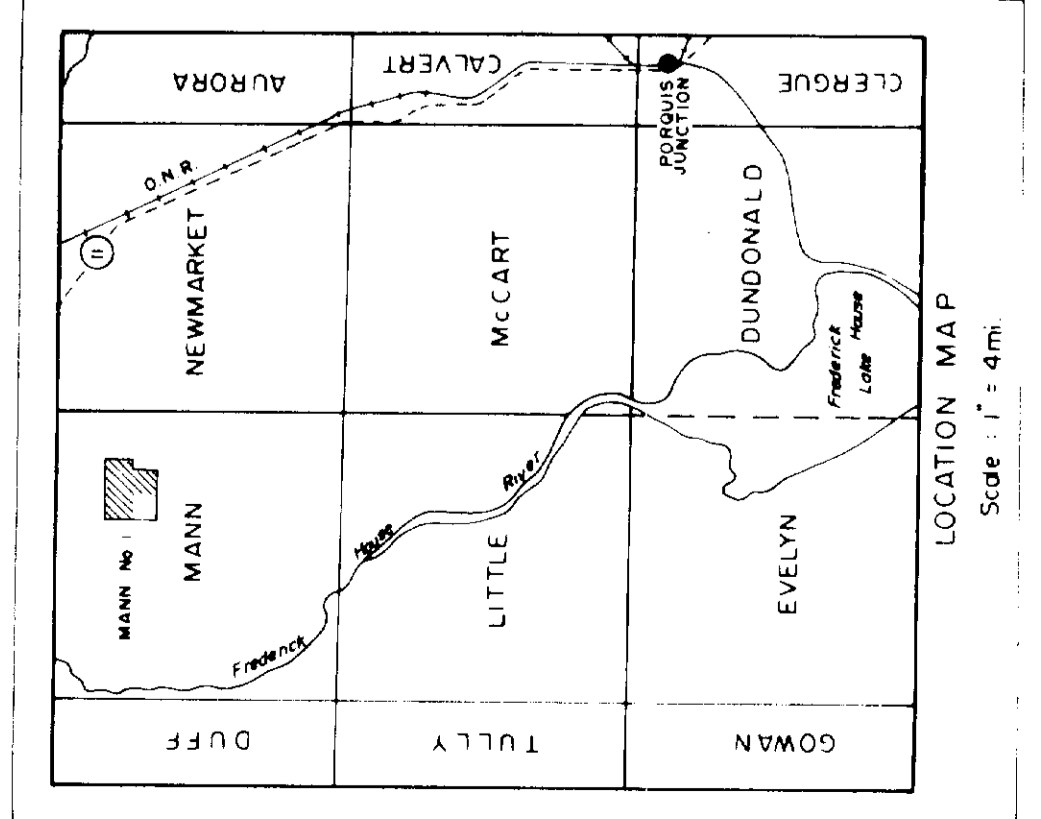
142 M

LOT 6

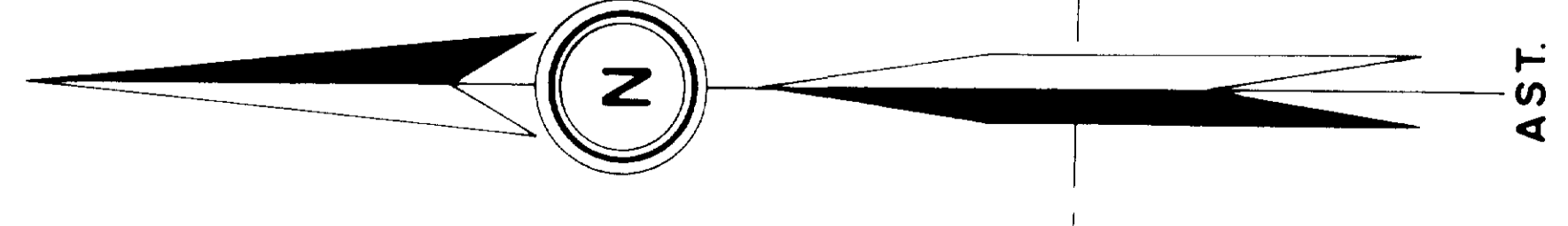
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LOT 4

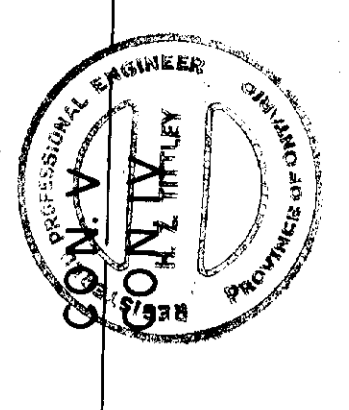
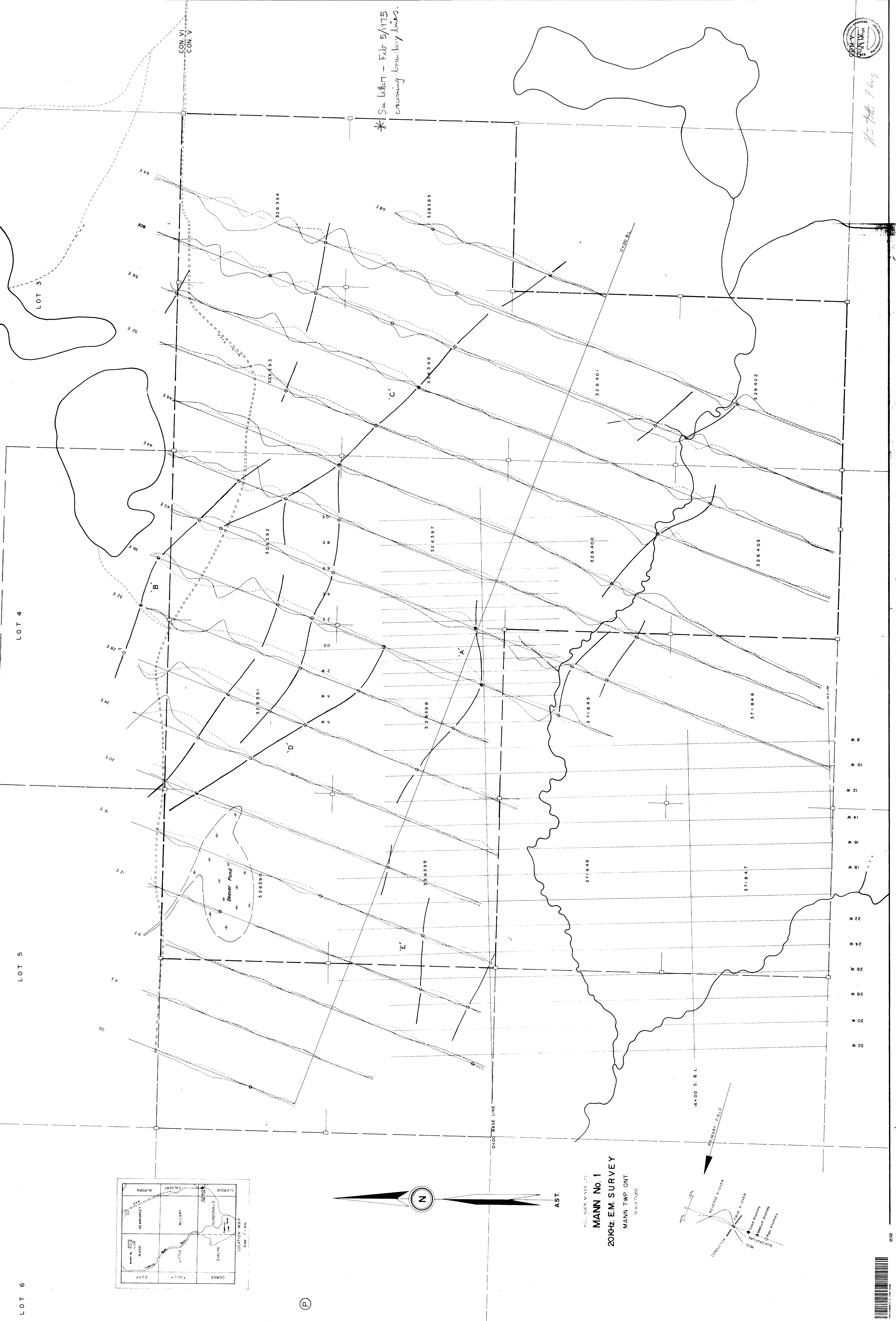
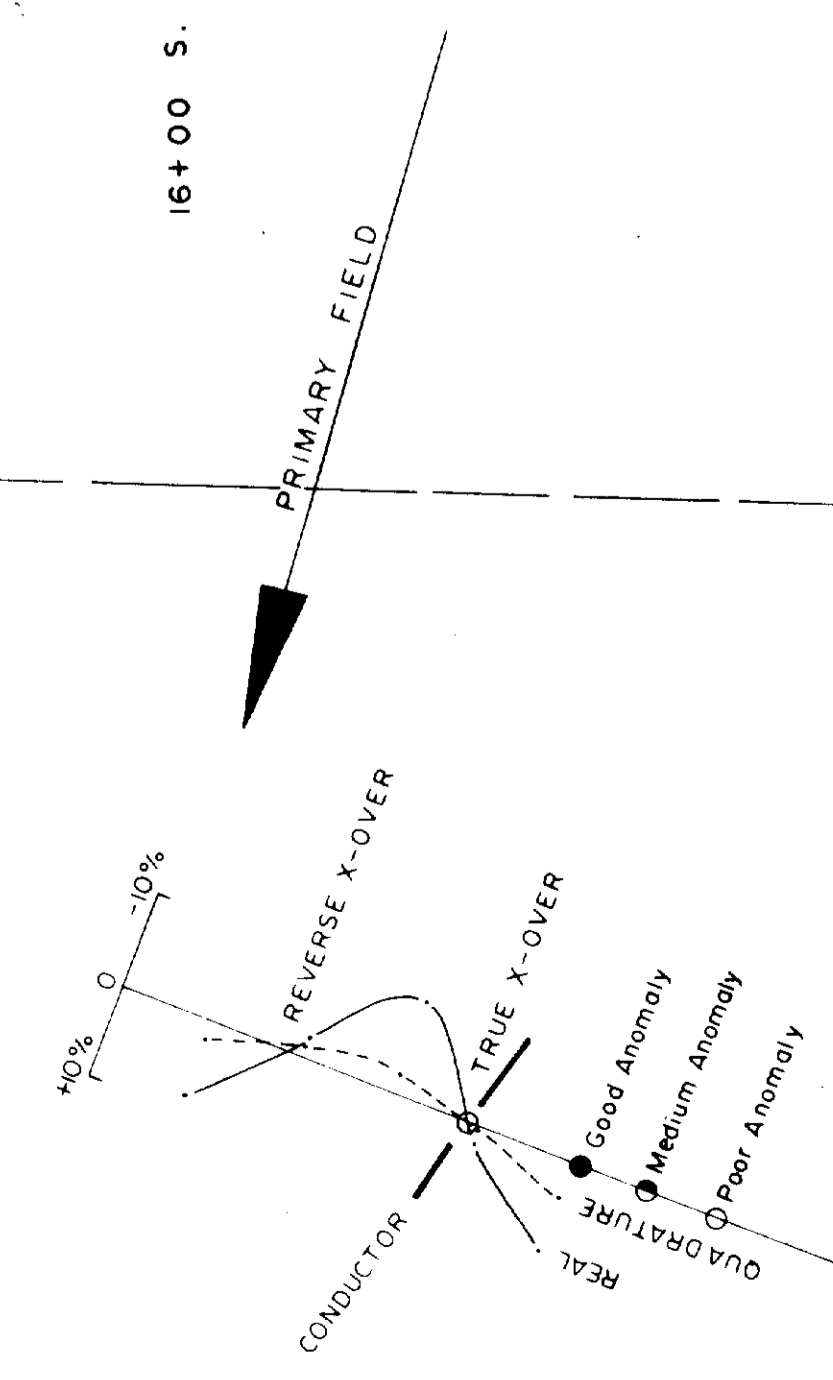
LOT 3



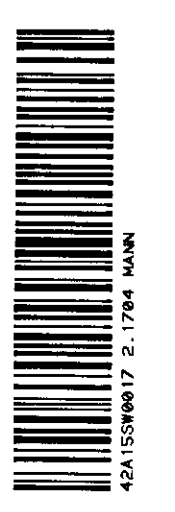
(P)



MANAGER W. NESBITT
MANN No. 1
20KHz. E.M. SURVEY
 MANN TWP. ONT.
 SCALE 1:12,000



W. Nesbitt
 Surveyor



LOT 6

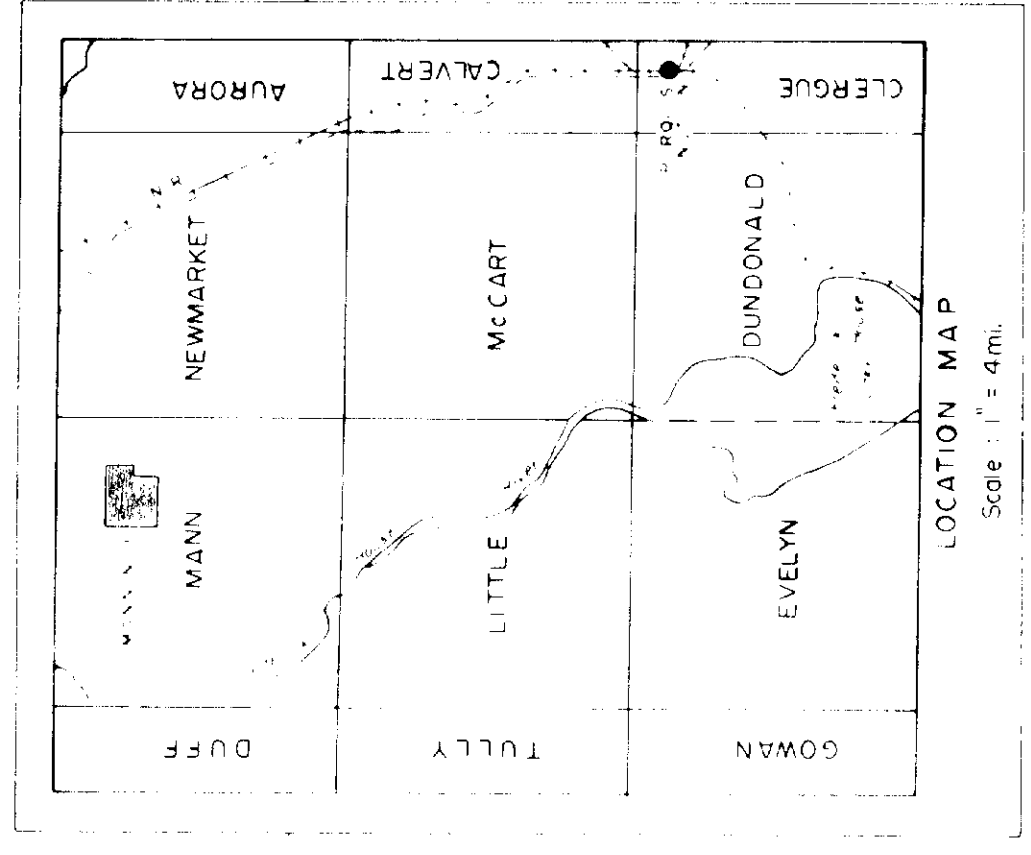
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LOT 4

LOT 3

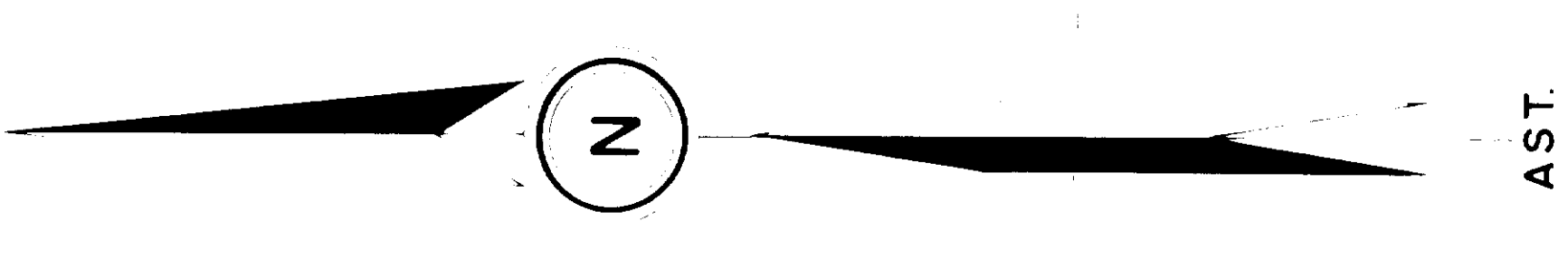
CON. VI
CON. V

CON. V
CON. IV



(P)

* See letter - Feb. 5/1975
concerning boundary lines.



MAN No. 1
GEOLOGICAL SURVEY
MANN TWP. ONT.

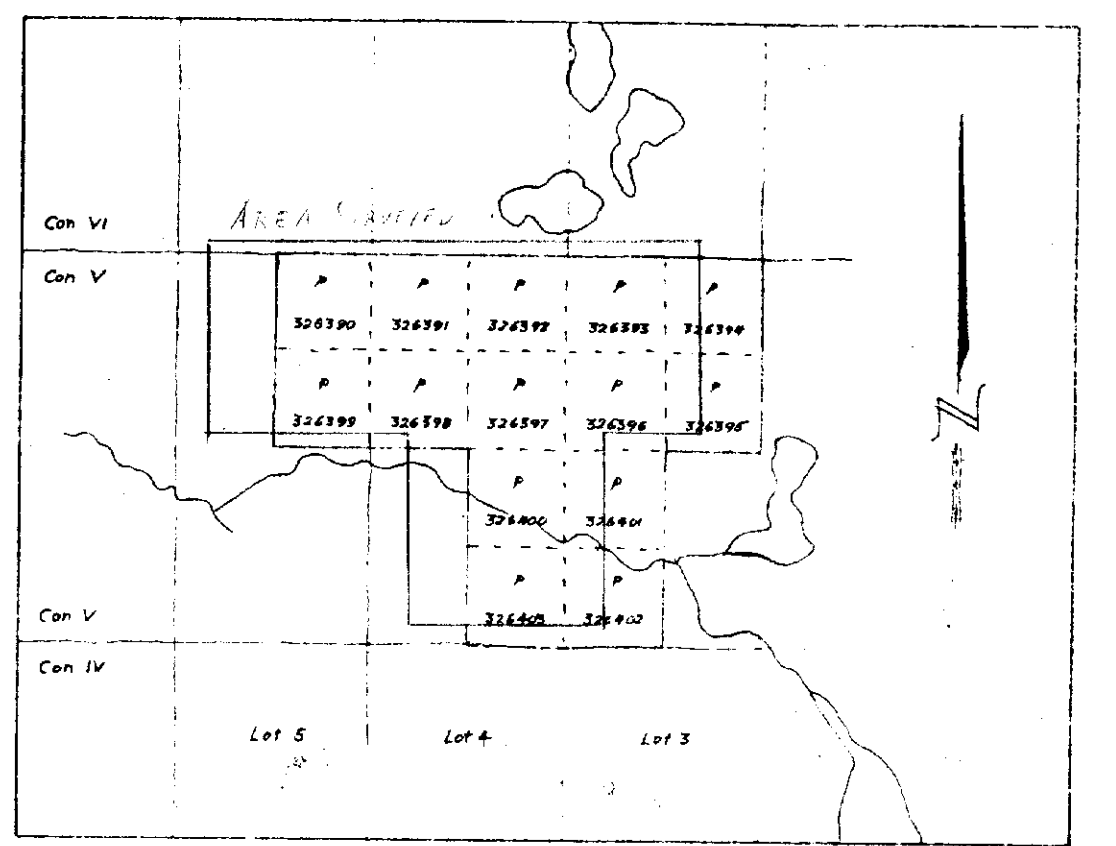
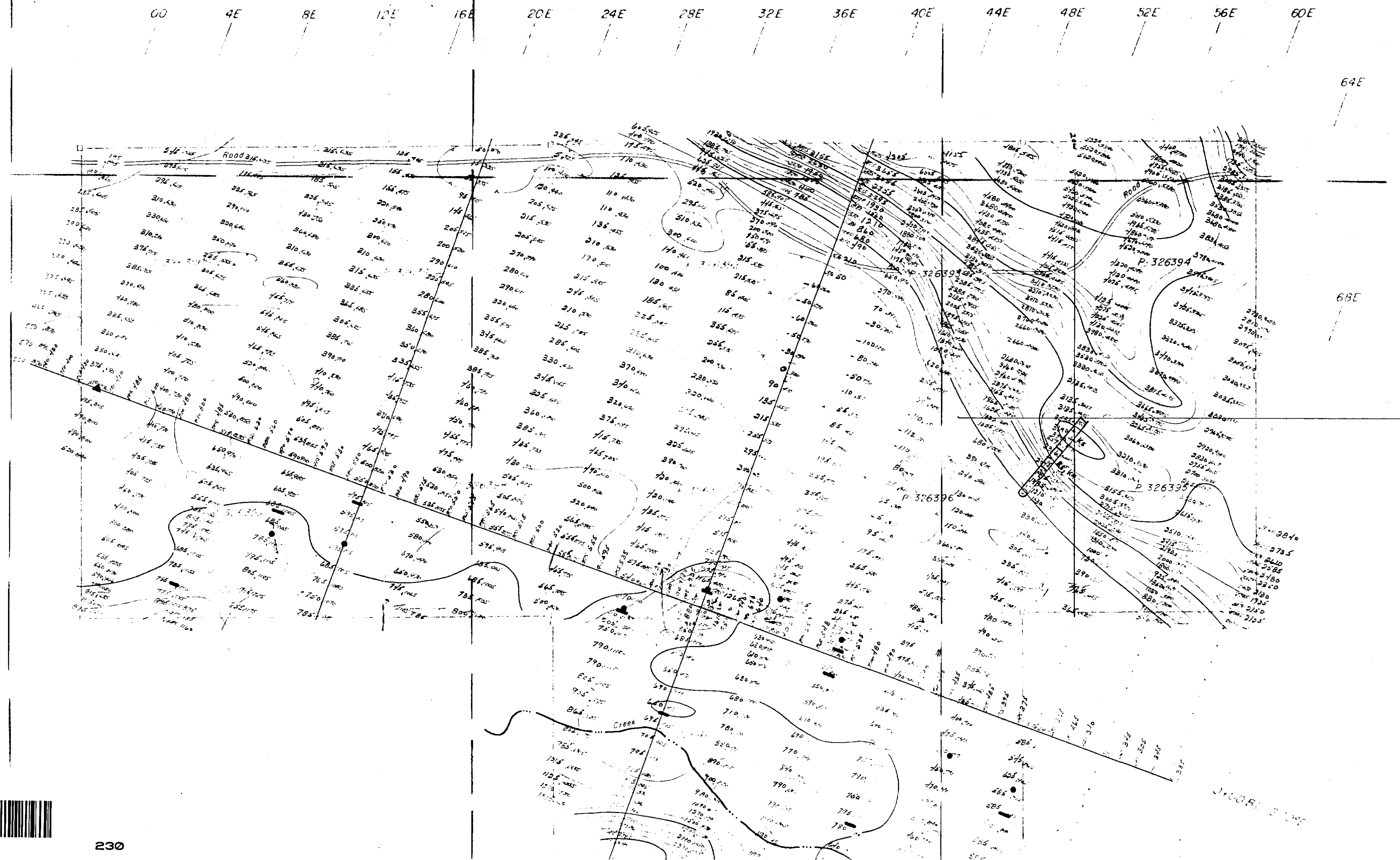
- LEGEND**
- Magnetic Contour..... 900
 - Topographic Boundary..... 900
 - Fault.....
 - Geological Contact.....
 - Strike Dip.....
 - Overturned.....
 - Extrusive Volcanic Sequence
 - Ultramafic intrusives
 - Feldspar Porphyry

21704



LOTS
 00 4E 8E 12E 16E 20E 24E 28E 32E 36E 40E 44E 48E 52E 56E 60E

Con VI
 Con V



LOCATION PLAN
 MANN 2-72 (Randa Option)
 Scale 2" = 1 Mile

COPY File T-1562
 Tinned 11/1/72

LEGEND

INSTRUMENT - McPhar Fluxgate M-700
 READINGS - Directly in gammas
 Contour at 200 ft intervals

