



**Report on the Vertical Loop Electromagnetic Survey
Conducted on the Property of
North Rankin Nickel Mines Limited
Moberly and Thorburn Townships - Porcupine Mining Division
Province of Ontario.**

SUMMARY:

Fifteen vertical loop electromagnetic anomalies were outlined on the property. Seven of these exhibit qualities which are interpreted to represent conductive material in the bedrock of the property. This conductive material may be either sulphide mineralisation or graphitic sediments.

CONCLUSIONS:

The anomalies are all covered by glacial deposits and are situated in a geological environment favorable for the presence of base metal mineral deposition.

RECOMMENDATIONS:

It is recommended that anomalies V1, V2, V3, V6, V7, V9 and V14 be investigated by at least one drill hole. This would entail 3500 feet of diamond drilling at an estimated cost of \$25,000.00.

The location of the seven recommended drill holes and order of drilling is as follows:-

<u>Hole No.</u>	<u>Departure</u>	<u>Latitude</u>	<u>Bearing (Ast)</u>	<u>Dip</u>	<u>Length Ft.</u>
66-1	Line 20+00 East	40+50 N. of B. L.	N 40° E	55°	500
66-2	Line 4+00 West	7+25 N. of B. L.	N 40° E	55°	500
66-3	Line 24+00 West	6+50 N. of B. L.	N 40° E	55°	500
66-4	Line 40+00 West	2+25 S. of B. L.	N 40° E	55°	500
66-5	Line 16+00 West	23+50 N. of B. L.	N 40° E	55°	500
66-6	Line 4+00 East	16+15 N. of B. L.	N 40° E	55°	500
66-7	Line 24+00 East	14+15 N. of B. L.	N 40° E	55°	500
					3500 ft.

Any success in any of the above holes would entail drill footage over and above that recommended.

PROPERTY, LOCATION, ACCESS, ETC:

The property of North Rankin Nickel Mines Limited consists of sixty-four (64) contiguous, unsurveyed and unpatented mining claims. They are numbered P-58360 to P-58399 inclusive, P-58364 to P-58399 inclusive and P-61682 to P-61699 inclusive. The area of the claim group is 2560 acres, more or less.

The claim group is located almost entirely in the northeast corner of Meberly Township, although part of the claim group extends into the adjoining Township of Thorburn, all located in the Porcupine Mining Division, in the Province of Ontario.

Access to the property is quite difficult. There are no roads within several miles of the property, nor are there any bodies of water which can be used as a landing field for ski or float-equipped aircraft. The most practical means of access is by helicopter from the town of Timmins, Ontario. The distance from Timmins to the property is about 28 air miles.

The surface of the property is flat and wooded. The forest consists essentially of spruce, jackpine and minor poplar. There are no large streams or rivers on the property.

HISTORY:

The property was staked to cover a broad, high intensity, northwest striking aeromagnetic anomaly, following the announcement of The Texas Gulf Sulphur base metal deposit in Kidd Township.

There is no record or evidence of exploratory work having been performed on the claim group, prior to its acquisition by North Rankin Nickel Mines Limited.

In 1965, North Rankin Nickel Mines Limited performed a magnetic and horizontal loop electromagnetic survey over the claim group at a picket line interval of 400 feet.

For details of and the results obtained in these surveys, one is referred to the report on the above in the company's files and dated April 21st, 1965.

PROPERTY GEOLOGY:

One rock outcrop is known to be present on the property. It is located in the northwest part of claim P-58360. The rest of the property is covered by glacial deposits, estimated to be in excess of 100 feet in depth, vertically.

Based on the pattern of isomagnetic lines and magnetic gradients of the ground magnetic survey, it is interpreted that the northeast two-thirds of the property is underlain by a complex of Kewatin lavas and minor sediments. The south one-third of the property is underlain by either granite and/or sediments. The main contact between the two stratigraphic units is irregular and located about 1000 feet south of the base line and more or less parallels it.

VERTICAL LOOP ELECTROMAGNETIC SURVEY:

A dual frequency vertical electromagnetic survey using the McPhar 1000/5000 cycle equipment was conducted over about eighty-five percent of the claim group. A minimum receiver-transmitter separation of 800 feet was maintained. This electromagnetic technique measures the inclination or dip of the resultant magnetic field in degrees.

Fifteen electromagnetic anomalies were outlined and these are depicted in the accompanying plans as V1 to V14 inclusive.

Anomaly V 1: - occurs on claims P-58289 and P-58288. It is about 1600 feet in length and strikes N 80° W. It is a low magnitude response, but exhibits moderate to good conductivity.

There is no appreciable magnetic response over the conductor. Geologically it lies to the east of a north-south striking diabase dyke.

Anomaly V 2: - lies on claim P-58292. It is a low amplitude response, and exhibits poor to fair conductivity. It is about 1200 feet in length and causative body is steeply dipping. There is good direct magnetic correlation with the zone, of over 8000 gammas. It would appear that this conductor is due to either sulphide mineralisation or graphite in an ultrabasic body.

Anomaly V 3: - this anomaly lies southeast of V 2, on claims P-61685, 61684 and 61691. It is about 800 feet in length and exhibits poor to moderate conductivity. The vertical loop response is coincident with a magnetic anomaly of over 5000 gammas and it also coincides with a horizontal loop E. M. anomaly.

It is interpreted that the anomaly, like V 2, is due to either sulphide mineralisation or graphite in an ultrabasic body.

Anomaly V 4: - lies on claim P-58271. It is about 400 feet in length and vertical in dip. Conductivity is good. There is no magnetic response over the zone.

Anomaly V 5: - located on claim P-58273. It strikes N 25° W and is 400 feet in length. It appears to be steep in dip. The anomaly exhibits poor conductivity and it is located between two pronounced magnetic zones. There

There is a broad 200 gamma relief directly over the conductor.

It is interpreted that the anomaly is probably caused by a shear zone.

Anomaly V 6:- lies on claims P-61698 and P-61699. It is 1600 feet in length, strikes N 50° W and dips steeply to the south. Conductivity varies from poor to good along strike.

It is located in a slight magnetic depression, flanked by two positive anomalies of about 700 gammas above background.

This anomaly is due to either mineralization or graphitic sediments.

Anomaly V 7:- lies northwest of V 6 and more or less on strike. It is about 800 feet in length and vertical in dip. It exhibits good conductivity characteristics. Like V 6, it is interpreted to be caused by sulphide mineralization or graphitic sediments.

Anomaly V 8:- occurs on claim F-58292 and 250 feet north of V 2 and parallel to it. It is a low magnitude response and conductivity of the zone is good to excellent. It is situated on the flank of a high intensity magnetic anomaly. The cause of this response could well be due to mineralization in bedrock of the property.

Anomaly V 9:- this anomaly lies on claims P-61682, 58299 and 61694. It is about 1400 feet in length and steeply dipping. Conductivity of the zone along strike varies from good to excellent. There is no appreciable magnetic response over the zone and near the southeast end, a north-south diabase dike about 100 feet in width cuts across the zone.

A weak horizontal loop anomaly (Q) is coincident with the vertical loop anomaly.

This anomaly is due to either sulphide mineralization or graphitic sediments.

Anomaly V 10:- lies on claim P-58285, and about 600 feet in length. It is a low amplitude anomaly and conductivity is poor to fair. It trends at 90 degrees to a low intensity magnetic anomaly.

This anomalous zone appears to be caused by a conductive shear zone or overburden.

Anomaly V 11:- it is a one line anomaly lying about 100 feet north of the northwest extremity of V 9. Conductivity is poor to moderate, typical of a response obtained over shear zones.

Anomaly V 12:- this anomaly is a one-line response centered on claim P-58296. It is a low intensity response and has the earmarks of a conductive overburden or a shear zone.

Anomaly V 13:- occurs on claim P-61696 and 200 feet northeast of the east end of anomaly V 9. The west extremity of the anomaly is strictly a high frequency response and proceeding easterly, conductivity improves considerably. The anomaly appears to strike-off into the adjoining property. Like V 9, there is no appreciable magnetic response over the zone.

Anomaly V 14:- is located on claims P-58286 and P-58293. It is about 1000 feet in length and strikes N 50° W. The causative body could be up to 100 feet in width. Conductivity varies from fair to good. There is a modest magnetic response coincident with the west part of the anomaly, but the magnetic anomaly itself trends obliquely to the strike of the E. M. response.

It is interpreted that the anomaly is due to sulphide mineralisation or graphitic sediments.

Anomaly V 15:- located almost entirely on claims P-61696 and P-61697. It strikes N 25° W, astronomic and more or less follows a north-south magnetic trend, interpreted to represent a diabase dike. The magnitude of the responses is not great, nor distinct, consequently, the anomaly may well be due to conductive overburden.

From magnetic data, depth of overburden in around the electrical anomalous areas of the property appears to be about 100 to 150 feet.

Respectfully Submitted,

M. E. M. CONSULTANTS LIMITED.

MZ/sp


Michael Zurowski, B.Sc., P. Eng.



Report on the Magnetic and Electromagnetic Surveys
on the Property of
NORTH RANKIN NICKEL MINES LIMITED
Moberly and Thorburn Townships - Porcupine Mining Division
Province of Ontario

SUMMARY

The property of North Rankin Nickel Mines Limited consists of sixty-four (64) contiguous unsurveyed, and unpatented mining claims and are situated in the northeast and northwest corners of the townships of Moberly and Thorburn respectively, all in the Porcupine Mining Division of the Province of Ontario.

There are no rock outcrops on the property and the surface is covered by a varying thickness of glacial debris, mostly clay.

The property was acquired by staking to cover an airborne magnetic anomaly, following the announcement of a major base metal discovery by the Texas Gulf Sulphur Company in Kidd township.

CONCLUSIONS

Based entirely on the pattern of isomagnetic lines and magnetic gradients of the recently completed ground magnetic survey, it is interpreted that the northeast two-thirds of the property is underlain by a complex of Keewatin lavas and minor sediments. The southwest one-third of the property is underlain by either granite or sediments. The main contact between the two stratigraphic units is irregular and more or less, parallels the base line of the property.

Sills of peridotite or gabbro intrude the lava-sediment complex.

Northerly striking diabase dikes intrude all the above rocks.

The general strike of the rocks on the property is N 45°W, astronomic and dips are steep.

Ten electromagnetic anomalies were outlined. These are weak in magnitude, narrow in width and exhibit poor conductivity characteristics. It is interpreted that these anomalies are probably caused by conductive overburden, although there is a remote possibility that several may be due to poorly conductive material in the bedrock.

Further exploratory work, prior to any contemplated program of diamond drilling, should consist of additional check geophysical surveying utilizing another electromagnetic technique.

Sufficient assessment credits are available from the work performed, to keep the claims in good standing until April 27th, 1966.

RECOMMENDATIONS

It is recommended that all the horizontal-loop electromagnetic anomalies outlined on the property be surveyed in detail by the vertical loop electromagnetic technique in order to provide additional information towards interpretation of these anomalies. In addition, it is recommended that the survey be extended to cover the areas interpreted to be underlain by basic sill-like bodies on the property.

The cost of this additional geophysical work is estimated at \$3,000.00, maximum.

Upon completion of this survey work, a more intelligent decision as to whether or not further investigation of the property by diamond drilling is warranted.

PROPERTY, LOCATION, ACCESS, ETC.

The property of North Rankin Nickel Mines Limited consists of sixty-four (64) contiguous, unsurveyed and unpatented mining claims. They are numbered P-58300 to P-58309 inclusive, P-58264 to P-58299 inclusive and P-61682 to P-61699 inclusive. The area of the claim group is 2560 acres, more or less.

The claim group is located almost entirely in the northeast corner of Moberly Township, although part of the claim group extends into the adjoining Township of Thorburn, all located in the Porcupine Mining Division, in the Province of Ontario.

Access to the property is quite difficult. There are no roads within several miles of the property, nor are there any bodies of water which can be used as a landing field for ski or float-equipped aircraft. The most practical means of access is by helicopter from the town of Timmins, Ontario. The distance from Timmins to the property is about 28 air miles.

The surface of the property is flat and wooded. The forest consists essentially of spruce, jackpine and minor poplar. There are no large streams or rivers on the property.

HISTORY

There is no evidence, nor are there any records of exploratory work having been performed on this property.

The property was staked to cover a broad, high intensity, northwest striking aeromagnetic anomaly. This staking followed the discovery of the Texas Gulf Sulphur base metal deposit in Kidd Township.

PROPERTY GEOLOGY

There are no rock outcrops on the property and for that matter there appears to be no rock outcrops in the entire township of Moberly. The bedrock surface is covered by a varying thickness of glacial deposits.

GEOPHYSICAL SURVEYS

The Magnetic Survey was performed using a MF-1 Fluxgate magnetometer. It measures the vertical component of the earth's magnetic field. Results are shown on the accompanying plan to the scale of one inch equals 400 feet.

The main trend of isomagnetic lines is N 45° W, astronomic. The magnetic background of the northeast two-thirds of the property is almost twice that of the southwest one-third. This magnetic contrast suggests the presence of a geological contact between two distinct rock sequences. It is interpreted that the northeast two-thirds of the property is underlain mainly by lava flows with minor sedimentary rocks. The rocks on the balance one-third of the property are either granite or sediments. The contact between the two distinct rock types is irregular and more or less, parallels the base line and strikes North 45° West, astronomic. Along this contact and within the lava complex, there are a series of anomalous conditions of rather high magnetic susceptibility. These are interpreted to be caused by several tabular bodies of basic rock, either periodotite or gabbro in composition.

A secondary pattern of magnetic anomalous conditions were outlined. These are fairly narrow in width, of fair magnitude and strike in a north-south direction. These are interpreted to be caused by diabase dikes. Twin dikes occur in the west part of the property, Two others occur in the east half of the property.

Several fault zones are interpreted to be present. One fault occurs in the northwest part of the property. It strikes North 45° East. The main band of basic, sill-like, intrusives appear to be offset by this structure. In addition, movement along this fault appears to be pre-diabase. Another fault occurs in the northeast corner of the property. There appears to be some displacement of the diabase dikes in this area. Strike of this assumed fault appears to be about North 60° West.

From magnetic data, depth of overburden in the anomalous areas of the property to be 100 feet, minimum.

Electromagnetic Survey

The survey was conducted using a Ronka Mark 4, Horizontal Loop electromagnetic unit, utilizing a coil separation of 300 feet and a frequency of 876 c. p. s. This method measures the in-phase and out-of-phase components of the secondary magnetic field in terms of percent of normal or uniform field. Ratios of the in-phase to out-of-phase readings are considered to give indications of conductivity of causative bodies. A coil separation of 300 feet was used, giving a depth penetration in the order of 125 to 150 feet.

This survey revealed ten anomalous zones. These are indicated on the accompanying plan of the electromagnetic survey as A to J inclusive.

All the anomalies outlined are weak in magnitude, narrow in width and exhibit poor conductivity characteristics. Although several show magnetic coincidence, it is nevertheless interpreted that the anomalies outlined are primarily caused by conductive clay overburden. There is a possibility that several of the anomalies may be caused by poorly conductive material in the bedrock and covered by glacial deposits in excess of 100 feet in depth. Under these conditions the horizontal loop equipment, with a 300 foot coil separation, is operating at the limits of maximum depth penetration.

Respectfully submitted,

M. E. M. CONSULTANTS LTD.

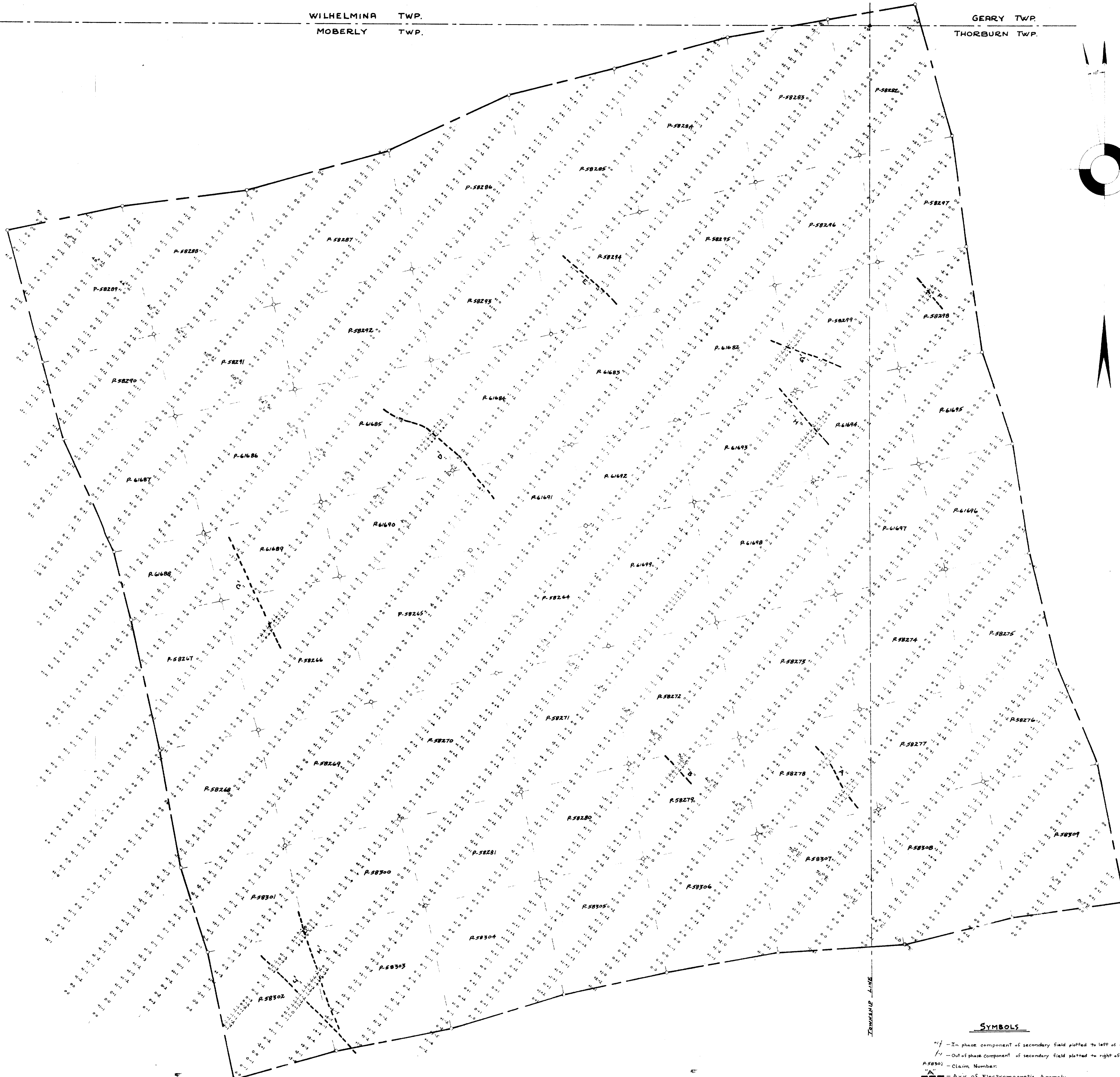
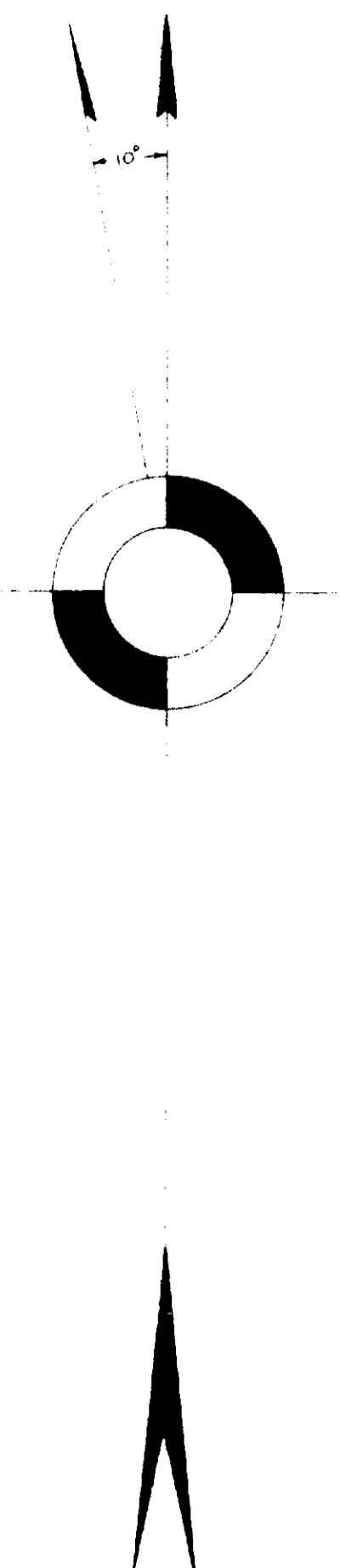


Michael Zarowski, B.Sc., P.Eng.

Toronto, Ontario,
April 11th, 1965.

WILHELMINA TWP.
MOBERLY TWP.

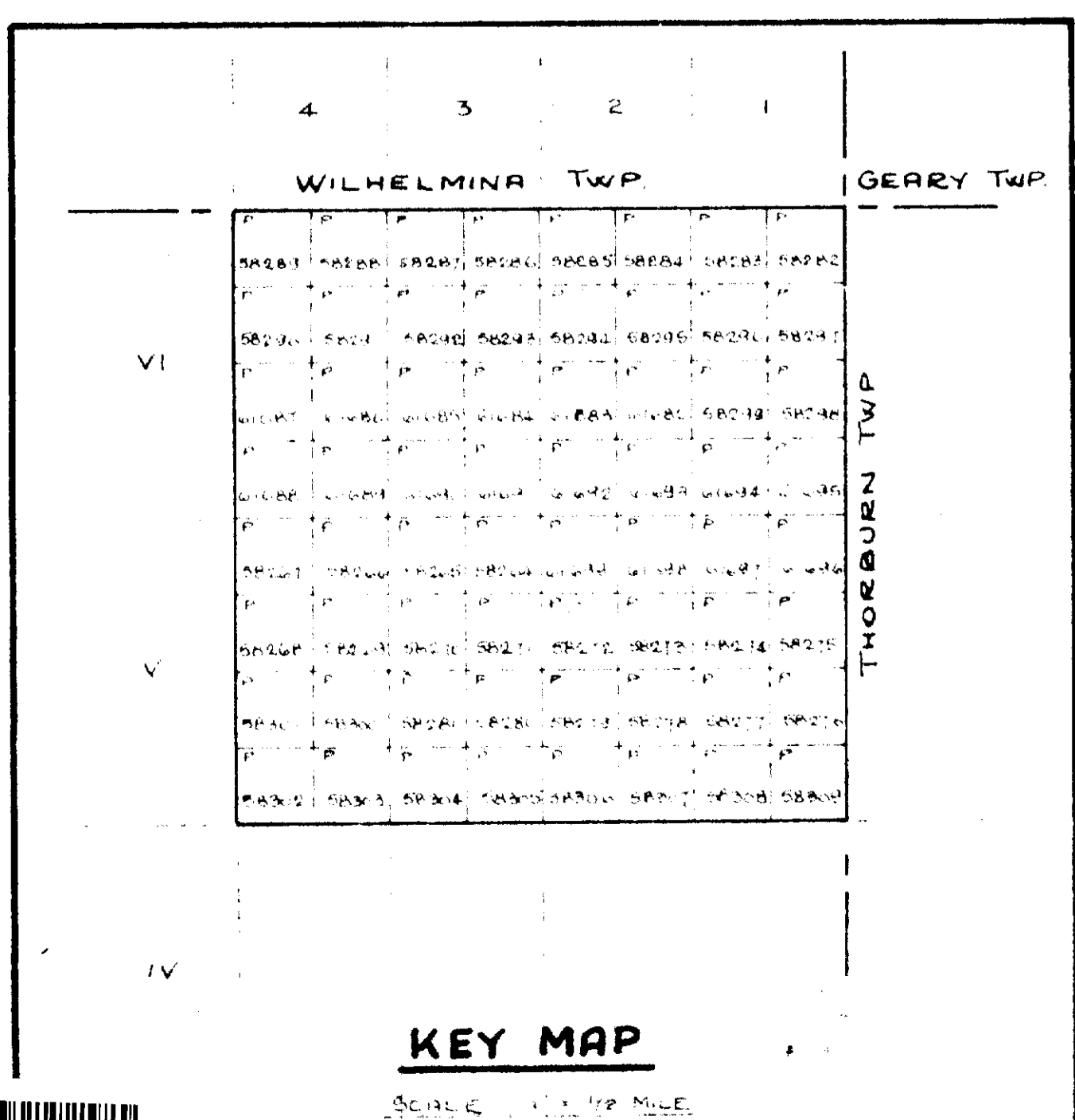
GERRY TWP.
THORBURN TWP.



SYMBOLS

- In phase component of secondary field plotted to left of line.
- Out of phase component of secondary field plotted to right of line.
- Claim Number.
- Axis of Electromagnetic Anomaly.

Note
Survey conducted using Rankin Mark
A unit frequency of 96 cps and 300 feet
cell separation.



63. 1572. 230

NORTH RANKIN NICKEL MINES LIMITED
MOBERLY TOWNSHIP - PROSPECTION DIVISION
PROVINCE OF ONTARIO

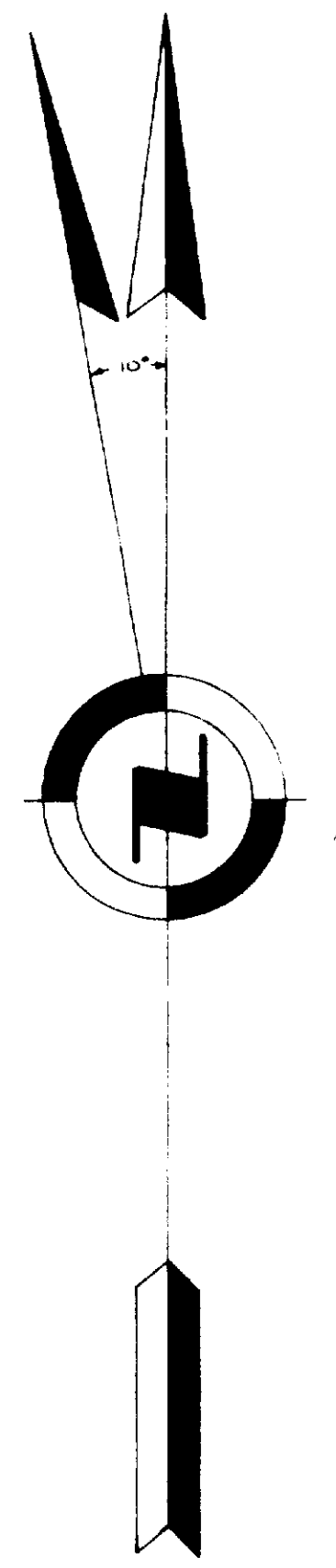
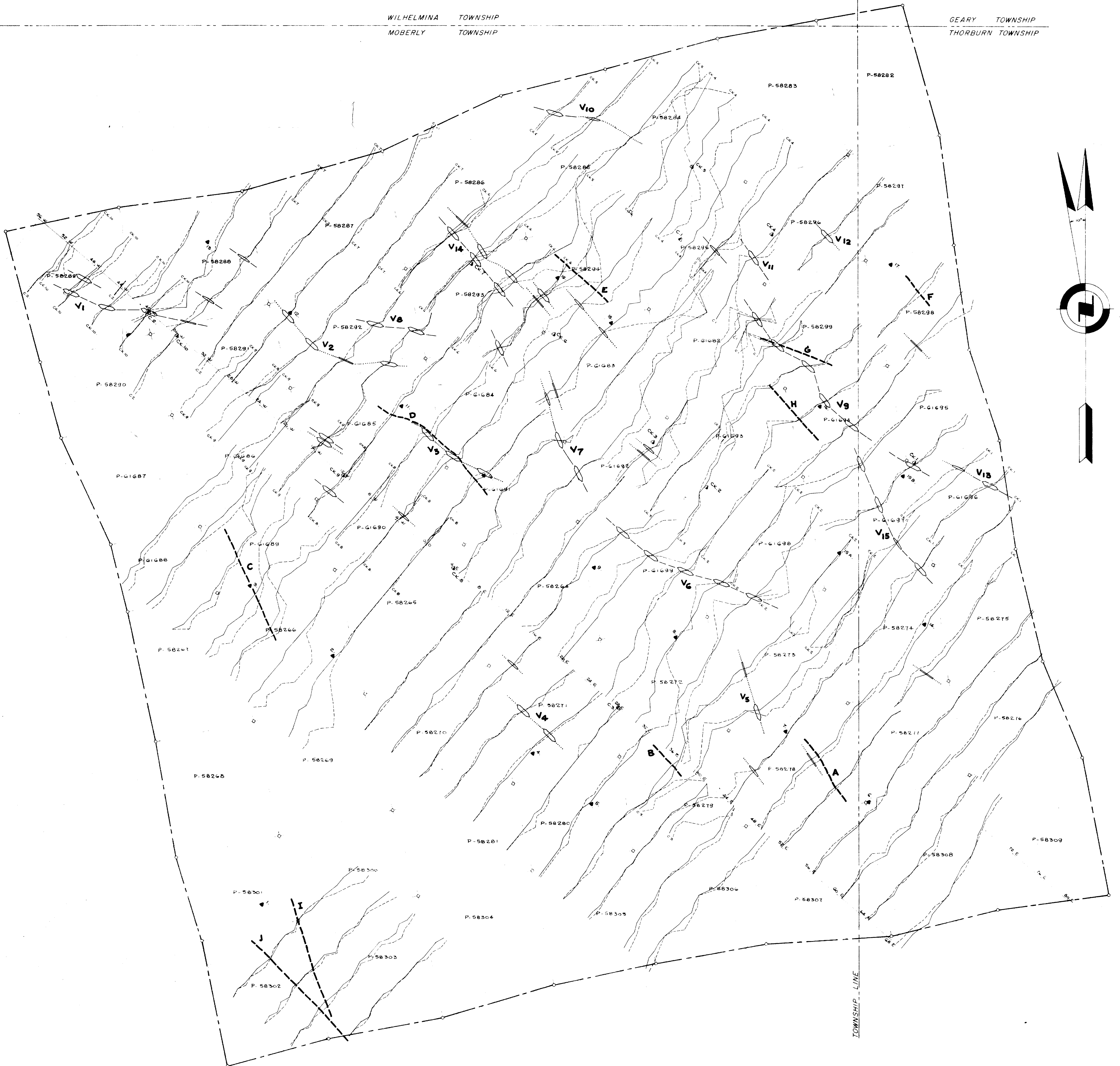
PLAN OF ELECTROMAGNETIC SURVEY

DATE: APRIL 27, 1965 SCALE: 1 INCH = 400 FEET DRAWN BY: MZ

M.E.M. CONSULTANTS LTD.

WILHELMINA TOWNSHIP
MOBERLY TOWNSHIP

GEARY TOWNSHIP
THORBURN TOWNSHIP



LOT 4	LOT 3	LOT 2	LOT 1
WILHELMINA TWP.			
GEARY TWP.			
THORBURN TWP.			
CON5	V1		
CON6	V		
CON5	V		
CON5	V		

KEY MAP
SCALE 1" = 1/2 MILE

SYMBOLS

- PROFILE OF 1000 CYCLE PER SECOND READINGS OF THE INCLINATION OF THE RESULTANT MAGNETIC FIELD IN DEGREES; NORTH INCLINATIONS PLOTTED TO RIGHT OF THE LINE, SOUTH INCLINATIONS PLOTTED TO LEFT OF THE LINE. PROFILE SCALE: 1" = 20 DEGREES.
- PROFILE OF 5000 CYCLE PER SECOND READINGS OF THE INCLINATION OF THE RESULTANT MAGNETIC FIELD IN DEGREES; NORTH INCLINATIONS PLOTTED TO RIGHT OF THE LINE, SOUTH INCLINATIONS PLOTTED TO LEFT OF THE LINE. PROFILE SCALE: 1" = 20 DEGREES.
- AXIS OF COINCIDENT 5000 AND 1000 CYCLE FREQUENCY RESPONSE.
- AXIS OF 5000 CYCLE FREQUENCY RESPONSE.
- AXIS OF 1000 CYCLE FREQUENCY RESPONSE.
- TRANSMITTER LOCATION
- HORIZONTAL LOOP E.M. ANOMALY

ANOMALY EVALUATION

- RED - GOOD TO EXCELLENT
- BLUE - FAIR TO GOOD
- YELLOW - POOR

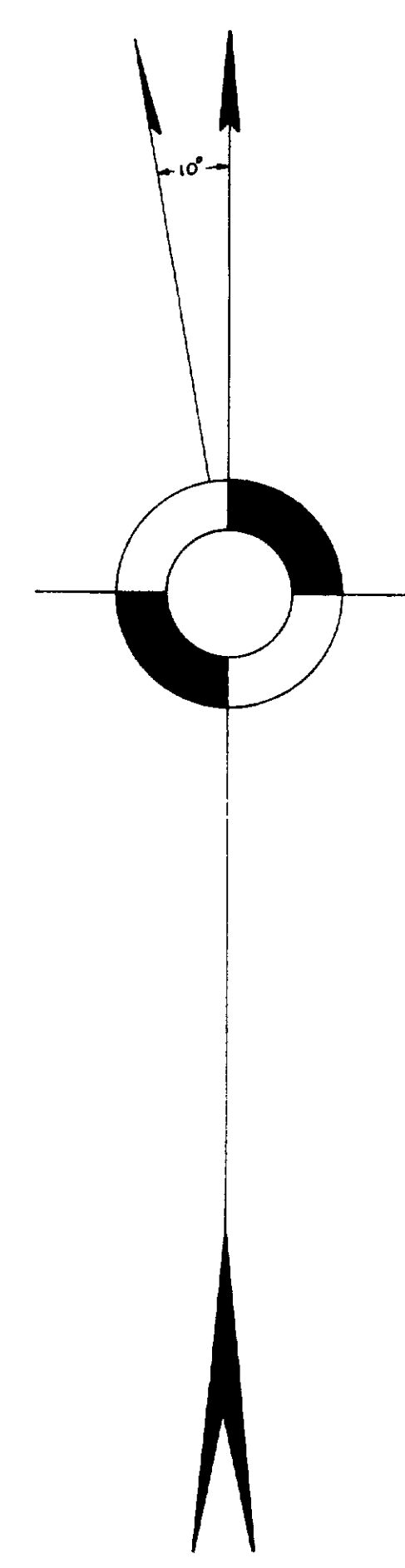
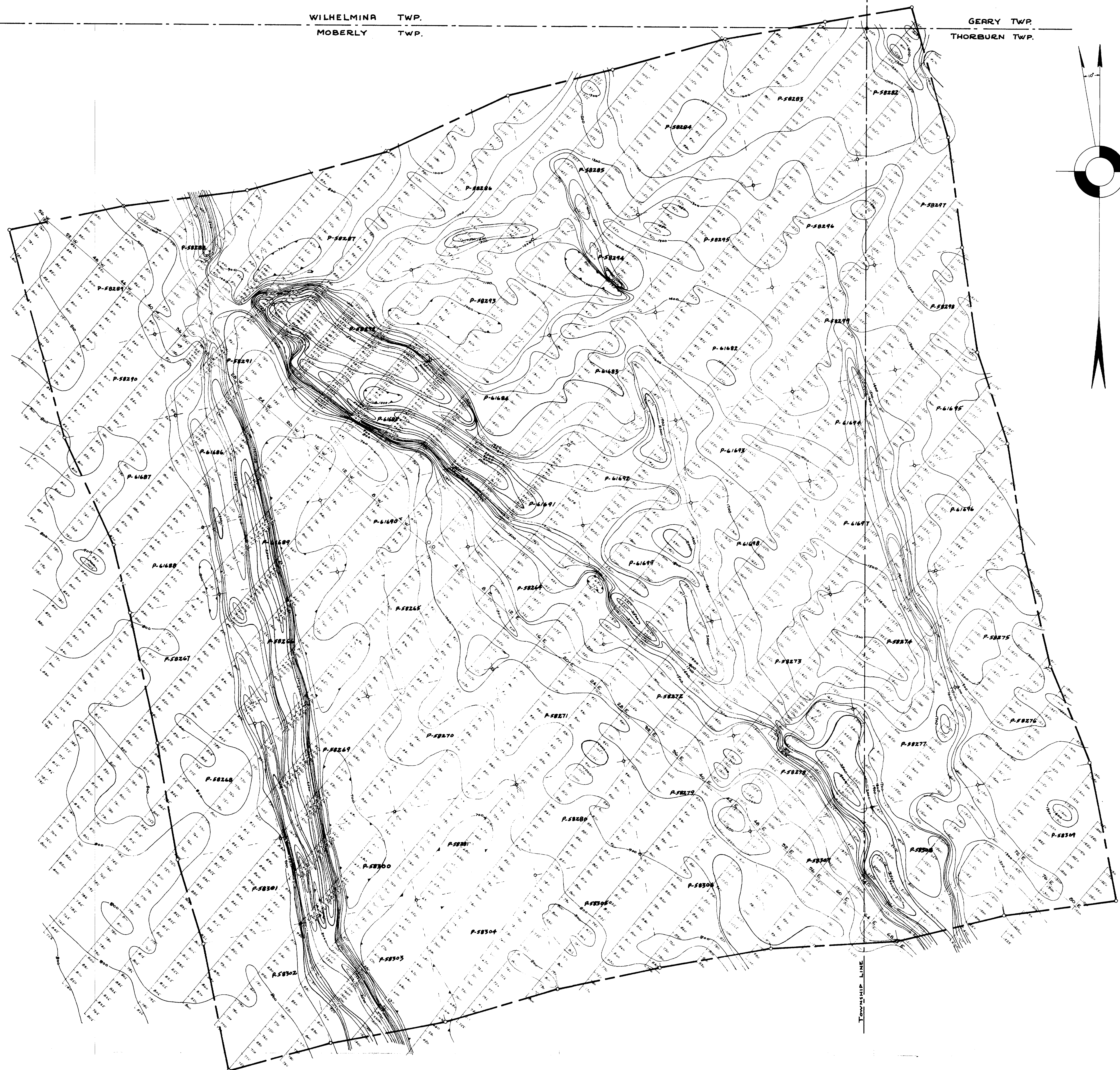
63.15/2 230

NORTH RANKIN NICKEL MINES LIMITED		
MOBERLY TOWNSHIP --- PORCUPINE MINING DIVISION --- ONTARIO		
PLAN OF VERTICAL LOOP ELECTROMAGNETIC SURVEY.		
DATE FEBRUARY 7, 1966	SCALE 1 INCH = 400 FEET	DRAWN BY <i>[Signature]</i>
M.E.M. CONSULTANTS LTD.		



WILHELMINA TWP.
MOBERLY TWP.

GERRY TWP.
THORBURN TWP.



		WILHELMINA TWP.				GERRY TWP.			
		4	3	2	1				
VI.	58285	58286	58287	58288	58289	58290	58291	58292	58293
	58294	58295	58296	58297	58298	58299	58300	58301	58302
	61681	61682	61683	61684	61685	61686	61687	61688	61689
	61690	61691	61692	61693	61694	61695	61696	61697	61698
V.	58303	58304	58305	58306	58307	58308	58309	58310	58311
	58312	58313	58314	58315	58316	58317	58318	58319	58320
	61699	61700	61701	61702	61703	61704	61705	61706	61707
	61708	61709	61710	61711	61712	61713	61714	61715	61716
IV.	58321	58322	58323	58324	58325	58326	58327	58328	58329
	58330	58331	58332	58333	58334	58335	58336	58337	58338
	61717	61718	61719	61720	61721	61722	61723	61724	61725
	61726	61727	61728	61729	61730	61731	61732	61733	61734

KEY MAP
SCALE: 1" = 1/8 MILE

SYMBOLS
 * RELATIVE VALUE OF THE VERTICAL COMPONENT OF EARTH'S MAGNETIC FIELD IN GAMMAS
 --- ISOMAGNETIC LINE.

NORTH RANKIN NICKEL MINES LIMITED
 MOBERLY TOWNSHIP - PORCUPINE MINING DIVISION
 PROVINCE OF ONTARIO

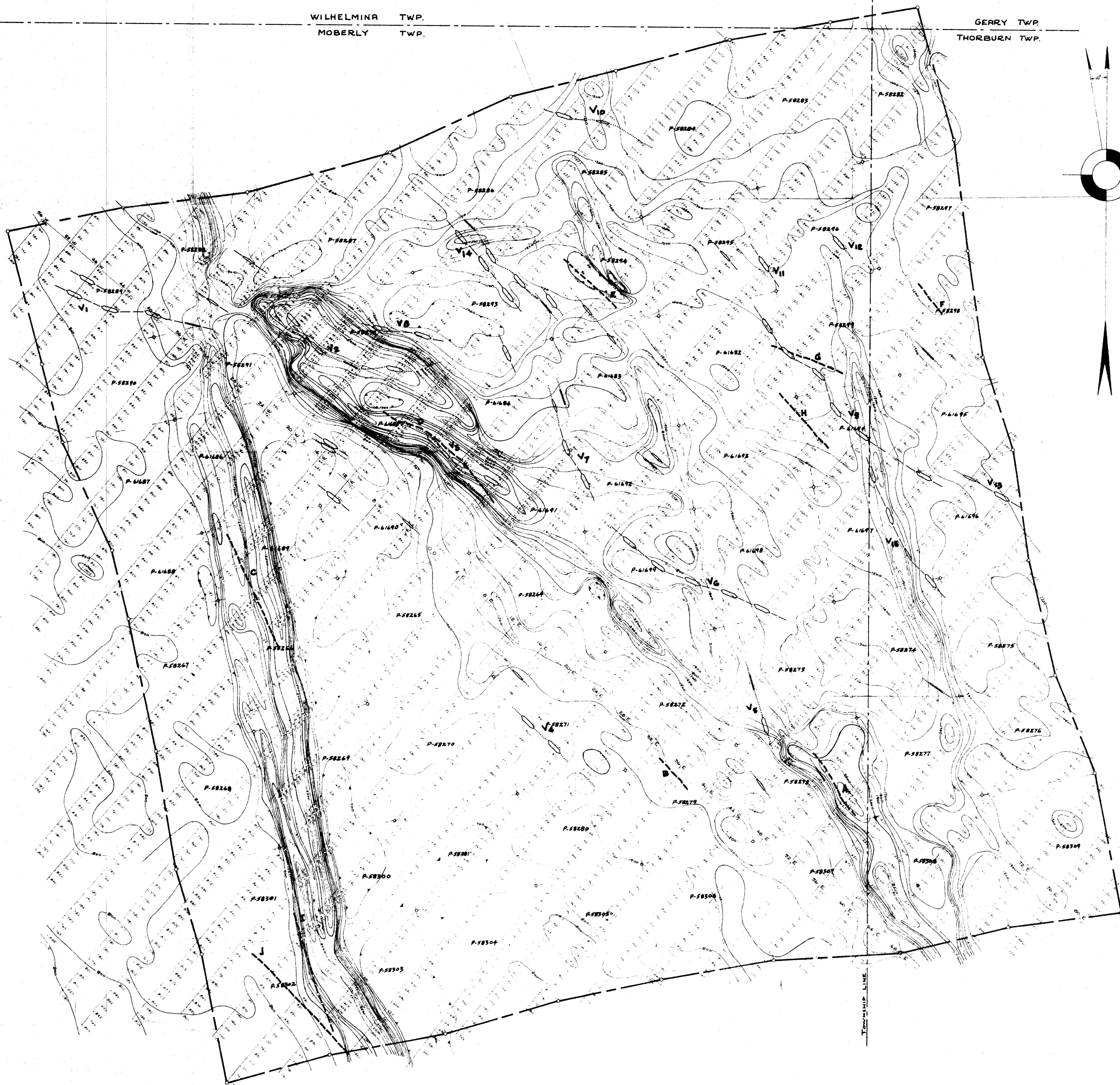
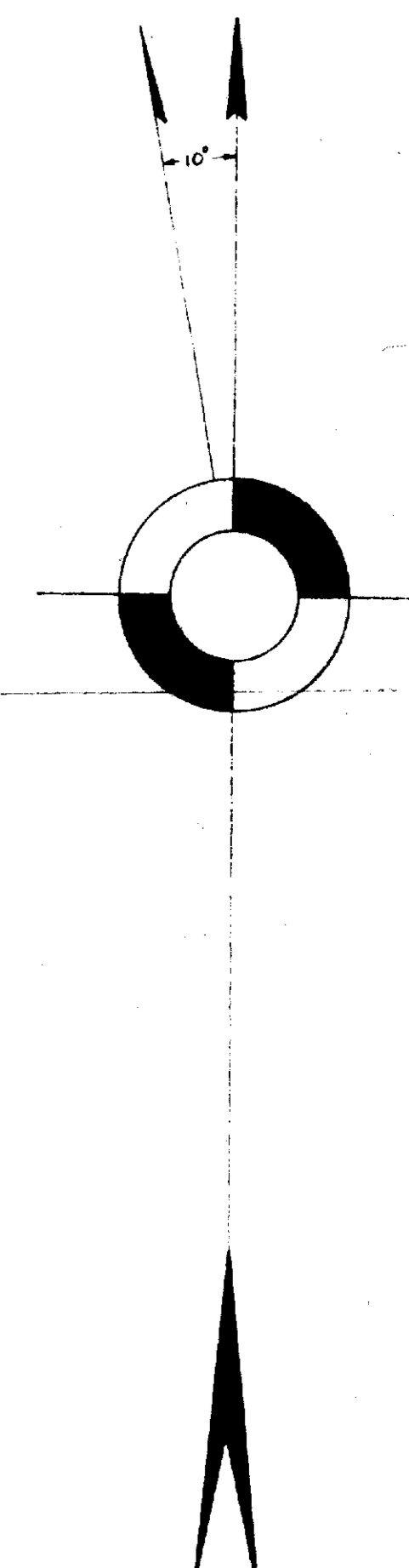
PLAN OF MAGNETOMETER SURVEY

DATE: MARCH 11th 1965 SCALE: 1 inch = 400 FEET DRAWN BY: MZ.

M.E.M. CONSULTANTS LTD.

WILHELMINA TWP.
MOBERLY TWP.

GERRY TWP.
THORBURN TWP.



WILHELMINA TWP.				GERRY TWP.			
	4	3	2	1			
	58289	58290	58291	58292	58293	58294	58295
VI	58296	58297	58298	58299	58300	58301	58302
	58303	58304	58305	58306	58307	58308	58309
	58310	58311	58312	58313	58314	58315	58316
V	58317	58318	58319	58320	58321	58322	58323
	58324	58325	58326	58327	58328	58329	58330
	58331	58332	58333	58334	58335	58336	58337
	58338	58339	58340	58341	58342	58343	58344
IV	58345	58346	58347	58348	58349	58350	58351

KEY MAP
SCALE: 1" = 1/4 MILE

SYMBOLS

- RELATIVE VALUE OF THE VERTICAL COMPONENT OF EARTH'S MAGNETIC FIELD IN GAMMAS
- ISOMAGNETIC LINE
- AXIS OF QUADRANT 5000 AND 1000 CYCLE FREQUENCY RESPONSES
- AXIS OF 5000 CYCLE FREQUENCY RESPONSE
- AXIS OF 1000 CYCLE FREQUENCY RESPONSE
- HORIZONTAL LOOP E.M. ANOMALY

ANOMALY EVALUATION

- RED - GOOD TO EXCELLENT
- BLUE - FAIR TO GOOD
- YELLOW - POOR

631572 *[Signature]* 230

NORTH RANKIN NICKEL MINES LIMITED
MOBERLY TOWNSHIP - PORCUPINE MINING DIVISION
PROVINCE OF ONTARIO

PLAN OF MAGNETOMETER SURVEY

DATE: MARCH 11th 1965 SCALE: 1 INCH = 400 FEET DRAWN BY: M.Z.

M.E.M. CONSULTANTS LTD.