OM 84-6-C-357

41P11SE0041 63.4978 CHURCHILL

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FINAL REPORT
ON THE
SHINING TREE PROSPECTS
(Gosselin Claim Blocks)

Submitted by
Charles J. Kaiser

January 16, 1985

REGISTERED PROFESSIONAL ENGINEER
K. A. NAERT
PROVINCE OF ONTARIO

Summary

Paragenetic and fluid inclusion studies were done on vein mineralization from claim block 393621 to characterize gold mineralization in the Shining Tree area. The vein mineralization consists of an early generation of quartz-pyrite, and a later generation of gold-quartz-carbonate-chlorite-galena-sphalerite-chalcopyrite-tellurides. A period of shearing and cataclasis separated the two generations of mineralization. Gold occurs as (1) replacements of pyrite and galena, and (2) free grains in quartz-carbonate gangue.

Fluid inclusion work was pursued to discern differences in the conditions of early quartz and later carbonate mineralization. Fluid phase relationships in inclusions within both hosts were the same (e.g. presence of 1,2, and 3 phase inclusions at room temperature, widely variable fluid/fluid ratios, and some final homogenization temperatures greater than the critical point of water) and thus suggest that the fluids are CO_2-H_2O-NaCl mixtures that probably formed immiscible fluids during mineralization. Final homogenization temperatures of fluid inclusions in both hosts also covered the same range. Fluid inclusions associated with main-stage mineralization have final homogenization temperatures of 212 to 385°C. These temperatures represent minimum temperatures of mineralization; the actual temperatures probably were about 100 to 200°C higher. Fluid inclusion study could not identify fluids uniquely associated with gold mineralization.

The green carbonate rock from the alteration zone at the Gosselin shaft consists of carbonate, fuchsite, and disseminated pyrite. Gold was not found in the specimen examined.

This study suggests that sheared and/or sulfide-bearing veins would be favorable environments for gold mineralization.

Introduction

Gold mineralization in the Shining Tree area is found in quartz(carbonate) veins, shear zones, and carbonate-fuchsite alteration zones in Archean ultramafic to intermediate metavolcanics and metavolcaniclastic rocks. Later granitic and mafic intrusives were emplaced in the deformed rocks. Huronian sediments unconformably overlie the older Archean rocks.

Archean metavolcanics and related volcanisedimentary rocks in the Gosselin Group claim blocks consist of komatiite, basalt, andesite, and chlorite tuff and exhalite. Felsic hypabyssal intrusives cut the section and later mafic bodies were emplaced. The Gosselin vein-system and associated alteration zone represent the major expression of gold mineralization on the property. The "Gosselin Gold Zone" strikes north to northwest within basalts for up to 1 1/2 miles. Vein mineralization consists of scattered pockets of gold, pyrite, chalcopyrite, tetrahedrite, and tellurides in quartz gangue. A wallrock alteration zone consisting of quartz-carbonate-fuchsite occurs within and envelops the vein system. The carbonate alteration zone also carries gold.

Another set of quartz-carbonate veins (claim block 393621) strikes northwest and occurs about 4500 feet north of the Gosselin shaft. Here the veins are hosted by andesite that is locally carbonatized. Assays indicated that gold values ran high in sulfide-rich portions of the veins.

This report summarizes the laboratory investigation of carbonate-altered rock from the Gosselin Gold Zone (ST-1) and vein mineralization from claim block 393621 (ST-A,B,C,D) in an effort to characterize gold mineralization on the property. The mineralogy and paragenesis of vein material and green carbonate rock were determined from inspection of polished slabs and fluid inclusion chips from five grab samples. Fluid inclusion work was done on a SGE-USGS gas-flow heating/freezing stage.

Mineralogy and Paragenesis

The green carbonate rock (ST-1) collected near the Gosselin shaft consists of green carbonate, fuchsite (restricted to a thin band), and disseminated pyrite. It is cut by a white carbonate vein that carries nothing else. Gold was not observed in the sample.

Vein material (ST-A,B,C,D) collected from a blasted outcrop on claim block 393621 represents multiple generations of mineralization (at least two) of an active structure. The one-meter thick quartz-carbonate-pyrite vein cuts andesite at N60W and dips steeply.

Grab samples (ST-B,C,D) show (1) an early generation of quartz and pyrite (locally brecciated by shearing) and (2) a later generation of quartz-carbonate-chlorite-galena-sphalerite (with chalcopyrite disease)-gold-tellurides occupying the remaining open space in the vein and cementing brecciated early mineralization. Deformation between the two generations of mineralization produced either wispy ribbon structure (defined by entrained pyrite and later carbonate-chlorite mineralization)(ST-C) or brecciation in which the slight displacement of fragments is preferentially in one direction (ST-B). Shearing probably represents reactivation of the vein-controlling structure (field evidence could confirm this).

The later generation of mineralization is dominantly open space. Locally galena, gold, and tellurides replace pyrite, but only in close proximity to fractures or more commonly along fragment surfaces. Gold (seen only in ST-B) occurs as (1) replacements of pyrite (fragment surface and interior) and galena, and (2) free grains in quartz-carbonate gangue.

Wallrock alteration (seen in ST-D) consists of carbonitization, silicification, and pyritization. Pyrite in the wallrock occurs as small irregular grains, except near the vein-wallrock contact, where large (1mm) pyrite cubes are well developed.

Sample ST-A, collected from a gossany structure roughly parallel to the main vein, is a weathered carbonate vein. The carbonate is brecciated and re-cemented; no sulfides are present.

As with the veins at the Gosselin shaft, gold in vein material from claim block 393621 is associated with sulfide mineralization. More specifically, gold is associated with late quartz-carbonate-sulfide (no pyrite)-telluride mineralization that followed shearing and cataclasis of earlier quartz-pyrite mineralization. The "scattered pockets" of gold-sulfide mineralization in the veins of the Gosselin shaft may represent transposed early pyrite or infilled dilatant zones that formed by a similar shearing episode.

Fluid Inclusions

A preliminary study of fluid inclusions in vein quartz and carbonate (ST-B,C,D) was pursued. Microthermometric measurements of CO_2 phases homogenization temperature ($T_{H\ CO2}$) and final homogenization temperature (T_H) were done.

Vein quartz is characterized by very abundant small (<5μm) fluid inclusions, most of which occur along healed fractures. These fractures probably developed during the shearing event separating the two generations of mineralization. No set of inclusions could be correlated with gold mineralization. At room temperature these inclusions consist of one (L), two (L-V or L_1-L_2), or three (L_1-L_2-V) fluid phases. The innermost two fluid phases in three-phase fluid inclusions homogenized to the liquid phase at temperatures of 22.4 to 29.2°C. Final homogenization temperatures could not be determined for these inclusions. Two-phase fluid inclusions all homogenized to the liquid phase over atemperature range of 124 to >460°C (Fig. 1).

Fluid inclusions in later carbonate are much less abundant, but still display one, two, or three fluid phases at room temperature. The three-phase fluid inclusions were not suitable for microthermometric measurements. Two-phase fluid inclusions, however, homogenized to the liquid phase at temperatures of 133 to 360°C (Fig. 1).

These limited observations permit only very rough estimates of fluid composition. The three-phase fluid inclusions represent CO_2-H_2O fluid mixtures with at least 7 mole percent CO_2. The two-phase fluid inclusions could be either CO_2-H_2O fluid mixtures (L_1-L_2) or just H_2O (L-V). Because some inclusions homogenize at temperatures greater than 374°C (critical point of pure H_2O), a solute, probably NaCl, is a component of the fluid. The single-phase fluid inclusions may be low-temperature H_2O fluids or more probably, high-density CO_2 fluids (liquid). Overall, the fluid compositions appear to be CO_2-H_2O-NaCl mixtures. The variable CO_2/H_2O ratios of these fluids suggest that CO_2-rich and H_2O-rich immiscible fluids were present during mineralization. Further detailed microthermometric measurements could provide more definitive information on fluid composition.

Fluid inclusions in both quartz and late carbonate are of similar types and homogenized over similar temperature ranges (Fig. 1). It is tentatively proposed that similar fluids were present during quartz and carbonate deposition. Although the range of T_H is large (124->460°C, Fig. 1), distinct populations are present. Those inclusions homogenizing at $T < 160$°C probably are late low-temperature fluids post-dating mineralization. Those inclusions which homogenized at $T > 460$°C probably represent necked or healed decrepitated inclusions, and do not provide valid information about vein mineralization. Only rather saline fluids (>8 wt. % NaCl) could elevate the critical point of H_2O to >450°C, and fluid inclusion studies of other greenstone gold deposits reveal few fluids this saline. The bulk of T_H fall between 212 and 385°C, and probably represent T_H of fluids involved in quartz-carbonate mineralization. This range of T_H for mineralization agrees well with those for other greenstone gold deposits (200-400°C). These homogenization temperatures represent minimum temperatures of mineralization. Pressure corrections which add 100 to 200°C to T_H would not be unusual for this type of mineralization. CO_2-H_2O-NaCl phase relations are poorly known and it is doubtful whether actual temperature-pressure conditions of mineralization can be ascertained from fluid inclusion study.

Exploration Target

Gold is seen only in association with a late generation of quartz-carbonate-sulfide-telluride mineralization and this mineralization followed an episode of shearing. The most favorable exploration target would be sheared and/or sulfide-bearing veins.

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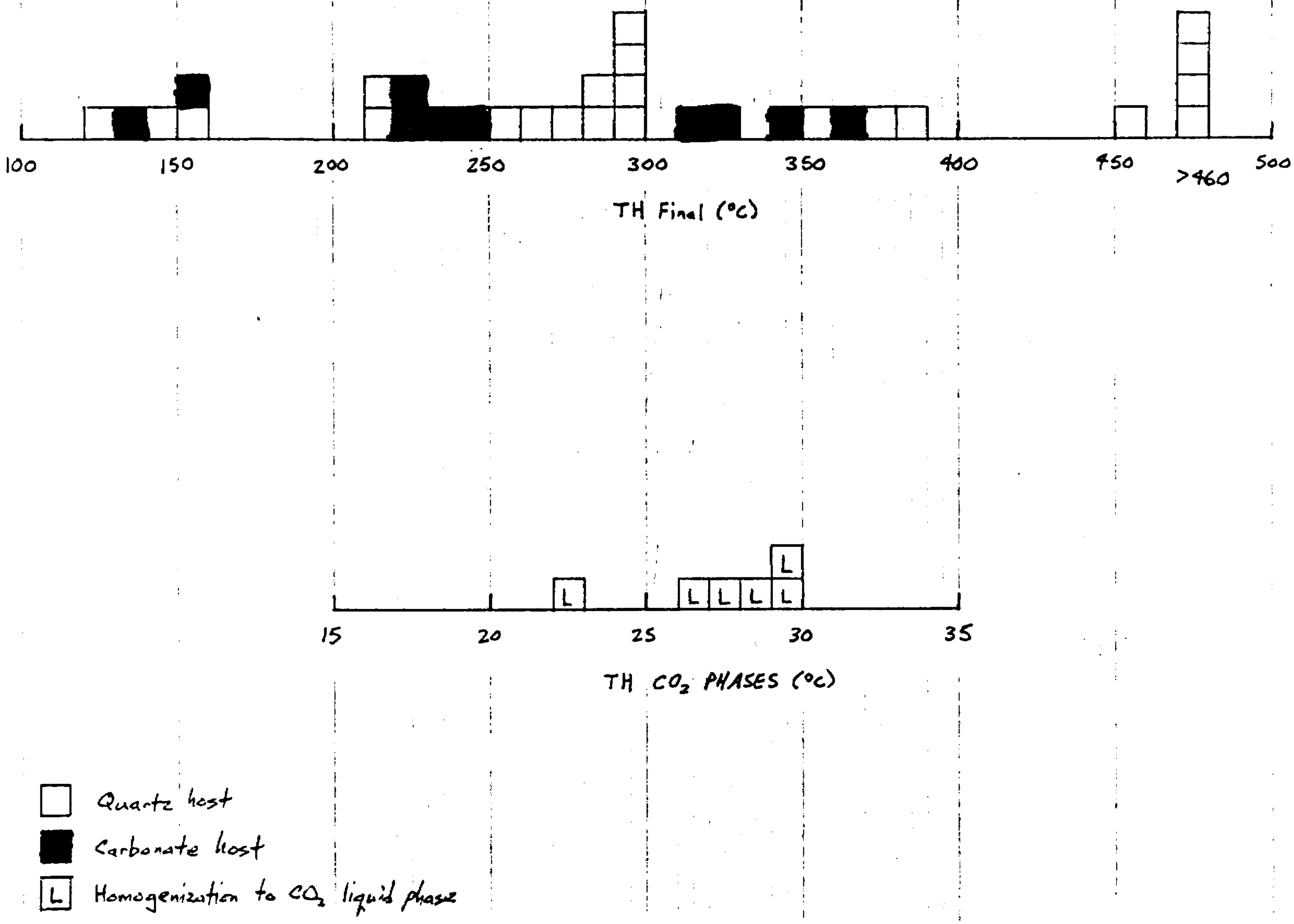
Figure 1. Histograms of final homogenization temperatures and CO_2 phases homogenization temperatures of fluid inclusions in vein material from claim block 393621.



SUMMARY

Sample	Paragenesis	Au Content Observed
Ola Lake	1) in brecciated quartz	none
	2) vein py + later cpy replacement	
	3) vein sph cuts and replacement py + cpy	
	4) crossing sph + cpy veins	
	5) carbonate veinlets	

Hubert L. Barnes
February 19, 1985

Ola Lake, Ontario

The sample is a quartz vein with sulfides (chalcopyrite, pyrite, and sphalerite) and carbonate filling fractures and with chalcopyrite and pyrite as disseminations. Chalcopyrite is the dominant sulfide (~80%) with lesser pyrite and sphalerite. No free gold was found.

Sulfides form irregular veinlets (commonly discontinuous) in fractured quartz. Four types of veinlets are recognized:

(1) Chalcopyrite-pyrite veinlets with pyrite commonly as euhedral cubes being replaced by chalcopyrite.
(2) Sphalerite veinlets crosscutting chalcopyrite-pyrite veinlets, with sphalerite locally replacing pyrite and chalcopyrite.
(3) Sphalerite-carbonate veinlets crosscut chalcopyrite-pyrite veinlets and splay off both sphalerite and carbonate veinlets.
(4) Carbonate veinlets.

Chalcopyrite-pyrite veinlets commonly were reopened along their length and are filled and locally replaced by sphalerite and carbonate.

A large clot of chalcopyrite-pyrite mineralization on the specimen's edge consists of euhedral and rounded pyrite and minor silicate inclusions in a matrix of chalcopyrite. Pyrite is embayed and replaced by chalcopyrite, and large cubes are fractured and infilled by chalcopyrite, sphalerite and carbonate. The sulfide clot is brecciated along a narrow zone near the contact with quartz; fractures are infilled by sphalerite and carbonate.

The quartz matrix of the vein is brecciated into variably-sized grains, forming a quartz breccia with a finely crystalline quartz matrix. Unlike the vein material from the Shining Tree prospect, the brecciated quartz is not rehealed by silica. Small grains of chalcopyrite and pyrite are disseminated throughout.

The paragenesis is simple and unambiguous. Early quartz is brecciated and mineralized by pyrite and then by chalcopyrite. The vein is sheared (brecciated) again, locally reopening chalcopyrite-pyrite veinlets, and mineralized by sphalerite and carbonate.

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A. INTRODUCTION

The Ola Lake property consists of twelve (12) contiguous claims in Miramichi Township, Larder Lake Mining Division, District of Sudbury, Ontario. These claims, which are held by Onitap Resources Inc. are L 597808, 597809, 597816, 597817, 597818, 597819, 597820, 597821, 597822, 597823, 597824 and 597825, (Fig. C-1, B-6). During January 1984, a grid was cut over the property and subsequent EM-16 and magnetometer surveys were conducted by NAREX Ore Search Consultants Inc. Some trenching and sampling was subsequently done in November 1984 which was followed by a diamond drill program in February 1985, conducted by Narex Ore Search Consultants Inc.

B. LOCATION AND ACCESS

The claim group is located in the eastern part of Miramichi Township, north of Highway 560 about four miles west of the village of Shiningtree, Ontario.

Ola Lake and parts of the Opikinimika River are major bodies of water encompassed by the claim block.

Access to the property is relatively easy via Opikinimika Lake and the Opikinimika River which crosses Highway 560 about four miles west of the village of Shiningtree. The distance is about six miles from the highway via the hydro road in the summer and by snowmobile in the winter.

C. GENERAL GEOLOGY AND PREVIOUS WORK.

Miramichi Twp. is underlain predominantly by felsic intrusive rocks, specifically hornblende-biotite granites, fig. 3. In the northeast corner of the township, mafic flows and pyroclastic

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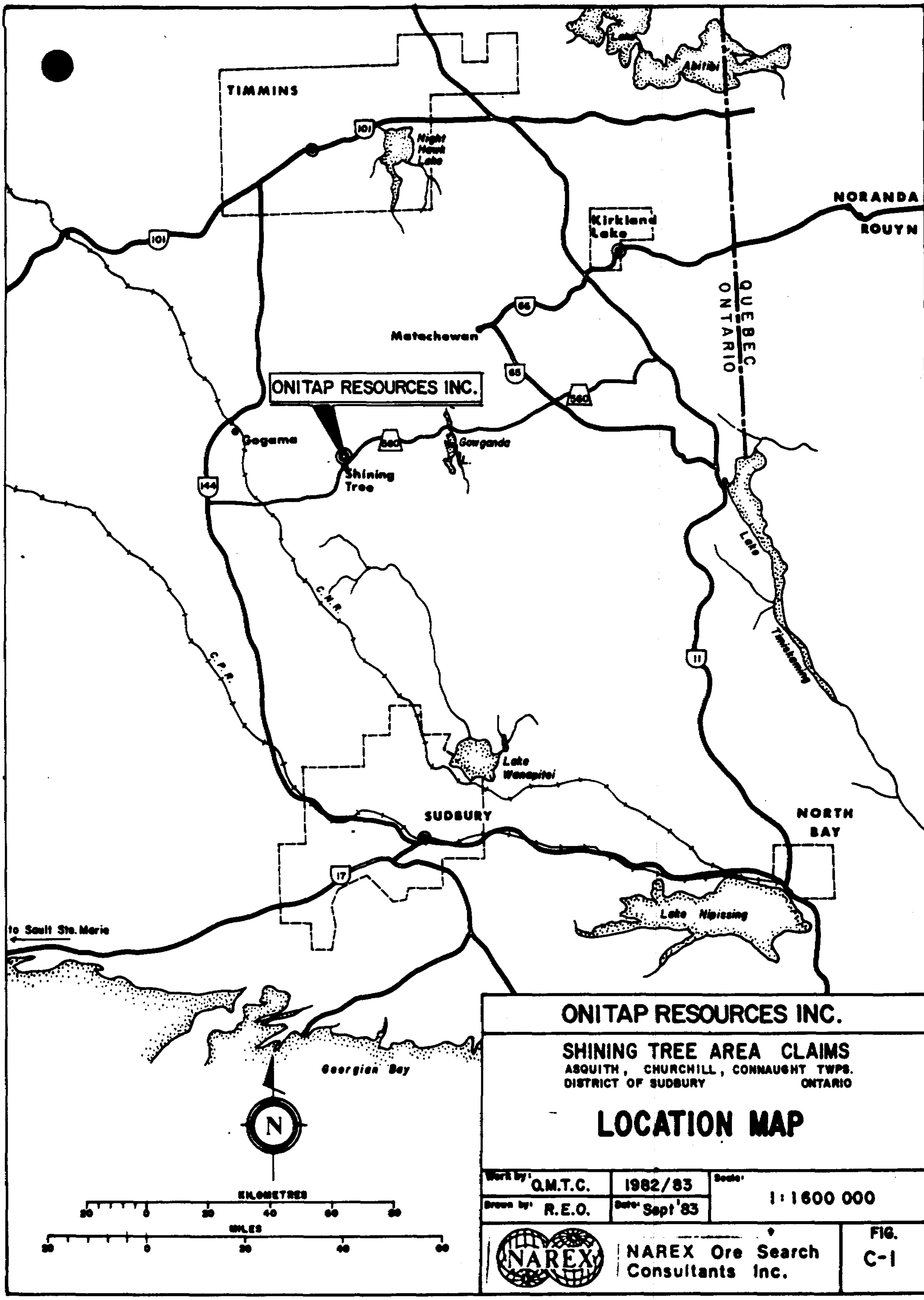
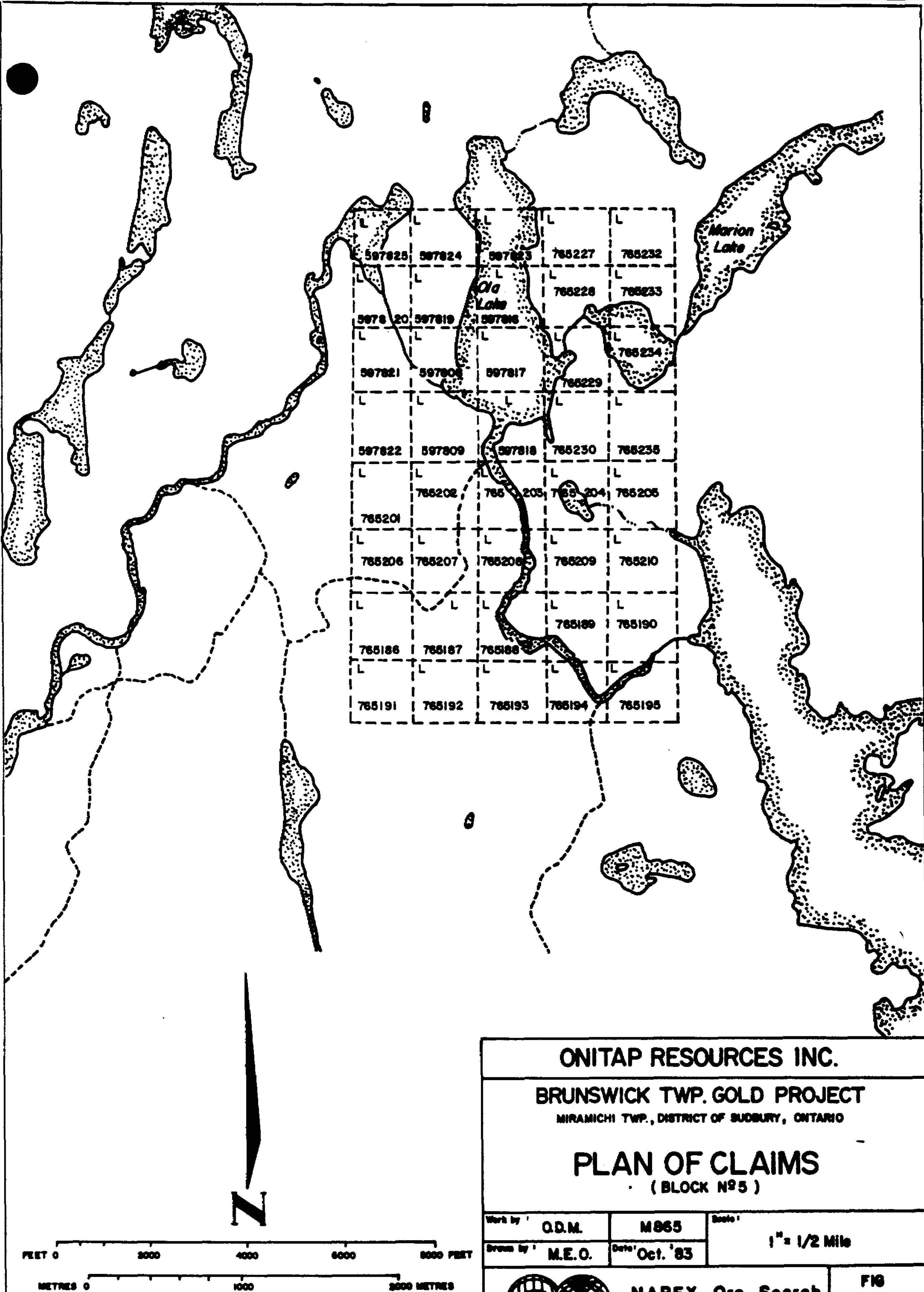

TIMMINS
Night Hawk Lake
Abitibi
101
NORANDA
ROUYN
Kirkland Lake
QUEBEC
ONTARIO
66
Matachewan
65
ONITAP RESOURCES INC.
560
Gogama
Shining Tree
Gowganda L.
144
Lake Timiskaming
11
C.N.R.
C.P.R.
Lake Wanapitei
SUDBURY
NORTH BAY
17
Lake Nipissing
to Sault Ste. Marie
Georgian Bay
N
KILOMETRES
20 0 20 40 60 80
MILES
20 0 20 40 60
ONITAP RESOURCES INC.
SHINING TREE AREA CLAIMS
ASQUITH, CHURCHILL, CONNAUGHT TWPS.
DISTRICT OF SUDBURY ONTARIO
LOCATION MAP
Work by: O.M.T.C.
1982/83
Scale: 1:1600 000
Drawn by: R.E.O.
Date: Sept '83
NAREX
NAREX Ore Search Consultants Inc.
FIG. C-1



ONITAP RESOURCES INC.

BRUNSWICK TWP. GOLD PROJECT

MIRAMICHI TWP., DISTRICT OF SUDBURY, ONTARIO

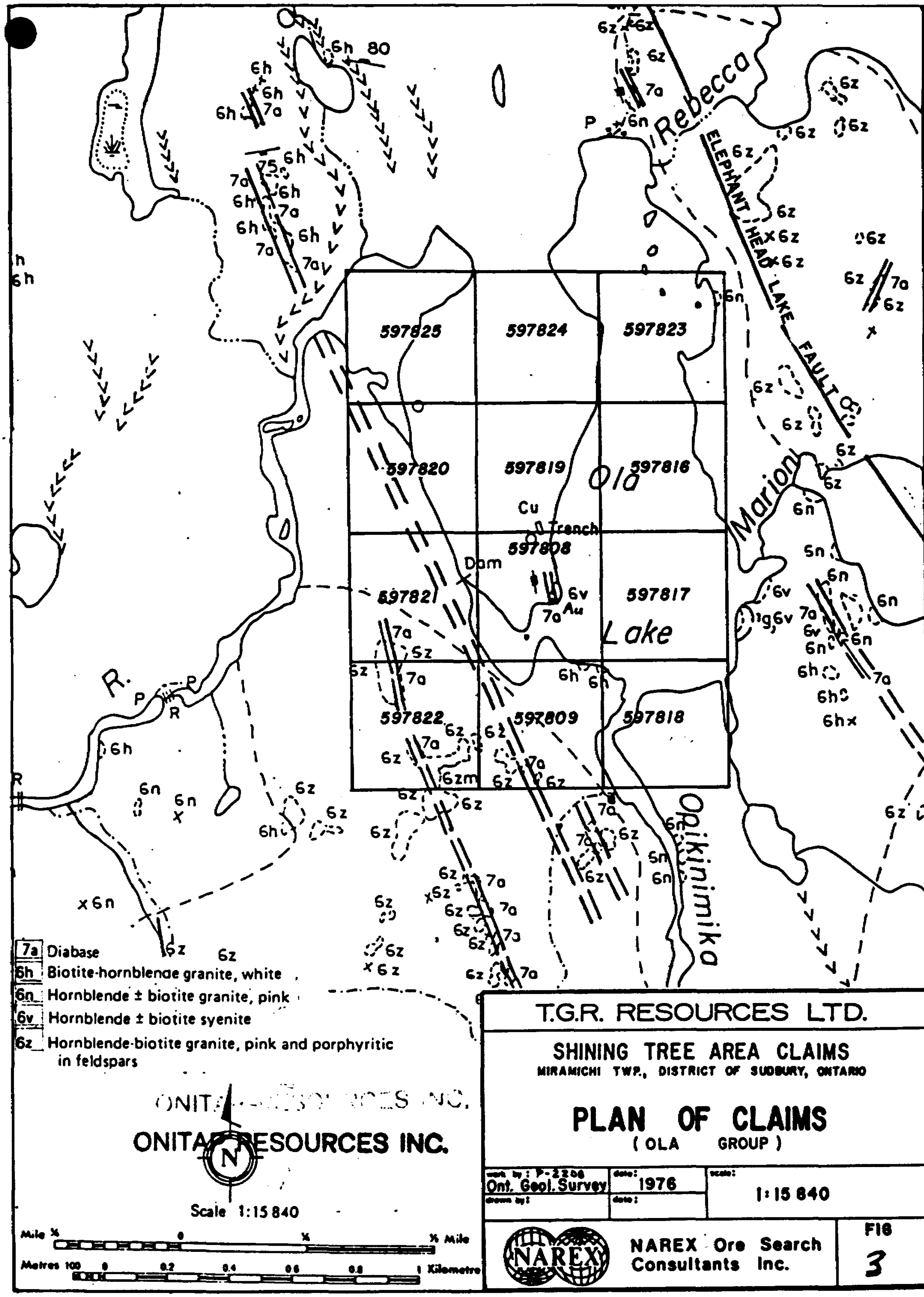
PLAN OF CLAIMS

(BLOCK Nº5)

Work by: O.D.M.	M865	Scale: 1" = 1/2 Mile
Drawn by: M.E.O.	Date: Oct. '83	

NAREX Ore Search Consultants Inc.

FIG B-6


Rebecca
ELEPHANT HEAD LAKE FAULT
Marion
Ola
Lake
Opikinimika
597825
597824
597823
597820
597819
597816
597808
597821
597817
597822
597809
597818
Cu
Trench
Dam
Au
7a Diabase
6h Biotite-hornblende granite, white
6n Hornblende ± biotite granite, pink
6v Hornblende ± biotite syenite
6z Hornblende-biotite granite, pink and porphyritic in feldspars
ONITAP RESOURCES INC.
N
Scale 1:15 840
Mile ½ 0 ½ ½ Mile
Metres 100 0 0.2 0.4 0.6 0.8 1 Kilometre
T.G.R. RESOURCES LTD.
SHINING TREE AREA CLAIMS
MIRAMICHI TWP., DISTRICT OF SUDBURY, ONTARIO
PLAN OF CLAIMS
(OLA GROUP)
work by: P-2256
Ont. Geol. Survey
drawn by:
date: 1976
date:
scale: 1:15 840
NAREX
NAREX Ore Search Consultants Inc.
FIG 3

rocks outcrop. Previous work in the area located a chalcopyrite showing which was held by Courier Explorations Ltd. in 1972. Work was planned to test the six to eight foot wide chalcopyrite-bearing quartz vein, but none was recorded in the assessment files. Sampling by NAREX Ore Search Consultants Inc. for T.G.R. Resources Ltd. in April 1983 obtained assays of up to 4.76 oz. Au/ton and 1.07 oz. Ag/ton from a quartz vein within the granite. A representative sample of the eight foot wide vein was subsequently taken and assayed 0.31 oz. Au/ton and 0.30 oz. Ag/ton. Claim block # 5 has definite potential for the discovery of further gold mineralization and additional auriferous quartz veins.

In January 1984 both VLF and magnetometer surveys were completed. Results from both the magnetometer and electromagnetic (EM-16) surveys show several significant anomalies and conductors over the Ola Lake claim block which consists of 12 contiguous claims.

Conductors A and B-B' are believed to be due to conductive overburden and conductive lake bottom, respectively. In the case of Conductor B-B', there is a small amount of doubt since, on one hand, the inphase and quadrature profiles may illustrate a good bedrock conductor, but the profile inflections are much too difuse to represent true cross-overs.

Results from the magnetometer survey indicate several en-echelon north striking zones with anomalous high values. There are a total of five zones spaced fairly regularly at 400 to 600 foot intervals. It is believed that the higher magnetic zones correspond to mafic diabase dykes with a higher magnetic expression than the surrounding granitic host rocks. Preliminary geological mapping by Carter (1979) supports these interpretations.

A program of geophysical follow-up consisting of a vertical loop EM survey and/or a self-potential (S.P.) survey should be carried out to check Conductors A and B-B' for disseminated sulphides etc..

The magnetometer survey picks out the diabase dykes fairly easily but there is no response for the adjacent quartz veining by either EM-16 or magnetometer methods. Therefore, it is believed that geophysical surveys will not greatly help in outlining the extent of the quartz veining and Au mineralization.

D. DIAMOND DRILL RESULTS

The diamond drilling was done from Feb.3-11, 1985 by Dominik Drilling of Timmins, Ontario and included 5 holes for a total of 466 feet. A brief summary of the drill holes will be given below; the detailed drill logs are found in Appendix A and the assay results in Appendix B.

The lithologies encountered in the drill hole consist mainly of (1) diabase dyke (2) granodiorite and (3) quartz veining QV.

DDH 85-3 - 45°, 63', az : 270° - on section, location 3 + 80S, 4 + 30E

From 0 to 11 Casing (lake)
From 11 to 63 Granodiorite
63 End of hole - sand seam can't continue -
Features - none - no QV intersected.

DDH 85-4, -45°, 101', az : 090° - on section; location
3 + 30E, 3 + 30S
From 0 to 9 Overburden
From 9 to 44.5 Diabase
From 44.5 to 101 Granodiorite
101 End of hole
Features - QV - 1/4" wide @ 46'; @ 57'-64' some chloritic
+ silicified sections in granodiorite - probably shear zone.

DDH 85-5, - 65°, 161'; az : 090° - on section
location 3 + 30E, 3 + 30S
From 0 to 7 Overburden
From 7 to 68 Diabase
From 68 to 161 Granodiorite
161 End of hole
Features - QV @ 73.5' - 2" wide - 1% cpy
From 118 to 120 Shear zone - silicified
From 120 to 160 Porphyritic granodiorite
Note: 85-4 and 85-5 were drilled from the same set up.

DDH 85-6, - 45°, 40', az : 090°, - 25 feet north of section
location 3 + 20S, 3 + 50E
From 0 to 3 Overburden
From 3 to 23 Diabase
From 23 to 40 Granodiorite
40 End of hole - sand seam can't continue
Features - @ 30.5 - 31.5 - QV - no sulphides
@ 31.5 - 38' - QCV stringers in the granodiorite.

.../..

DDH 85-7, - 45°, 101', az : 090°

Location 3 + 60S, 3 + 30E - 30' south of section

From	0	to	7	Overburden
From	7	to	32	Diabase
From	32	to	101	Granodiorite

101 End of hole

Features @ 32-33' - contact zone with 3" QV - 67 ppb Au
@ 36-69 chloritic, sheared with some 2% pyrite : 54-55' QV
1% py - 10" wide

Summary:

1. Diabase dykes - consist of m.g. dark green colour, massive, with plagioclase - amphibole, slightly porphyritic

2. Granodiorite - consists of coarse grained massive pink rock with plagioclase - K-spar - 30% quartz, slightly hematized plus chlorite in the matrix. In several holes intersected sheared - silicified sections also porphyritic sections and some syenite. Generally no sulphides present.

The locations of the drill holes are given in the following sketch (fig. 4).

Also the geological cross-section is given in fig. 5 with holes 85-3, 85-4, and 85-5 which are in the section and the projection of 85-6 (25 ft. north of the section) and the projection of 85-7 (30 feet south of section) onto the composite cross-section.

These holes were drilled to intersect the main five foot wide quartz vein beneath the main trench.

.../..

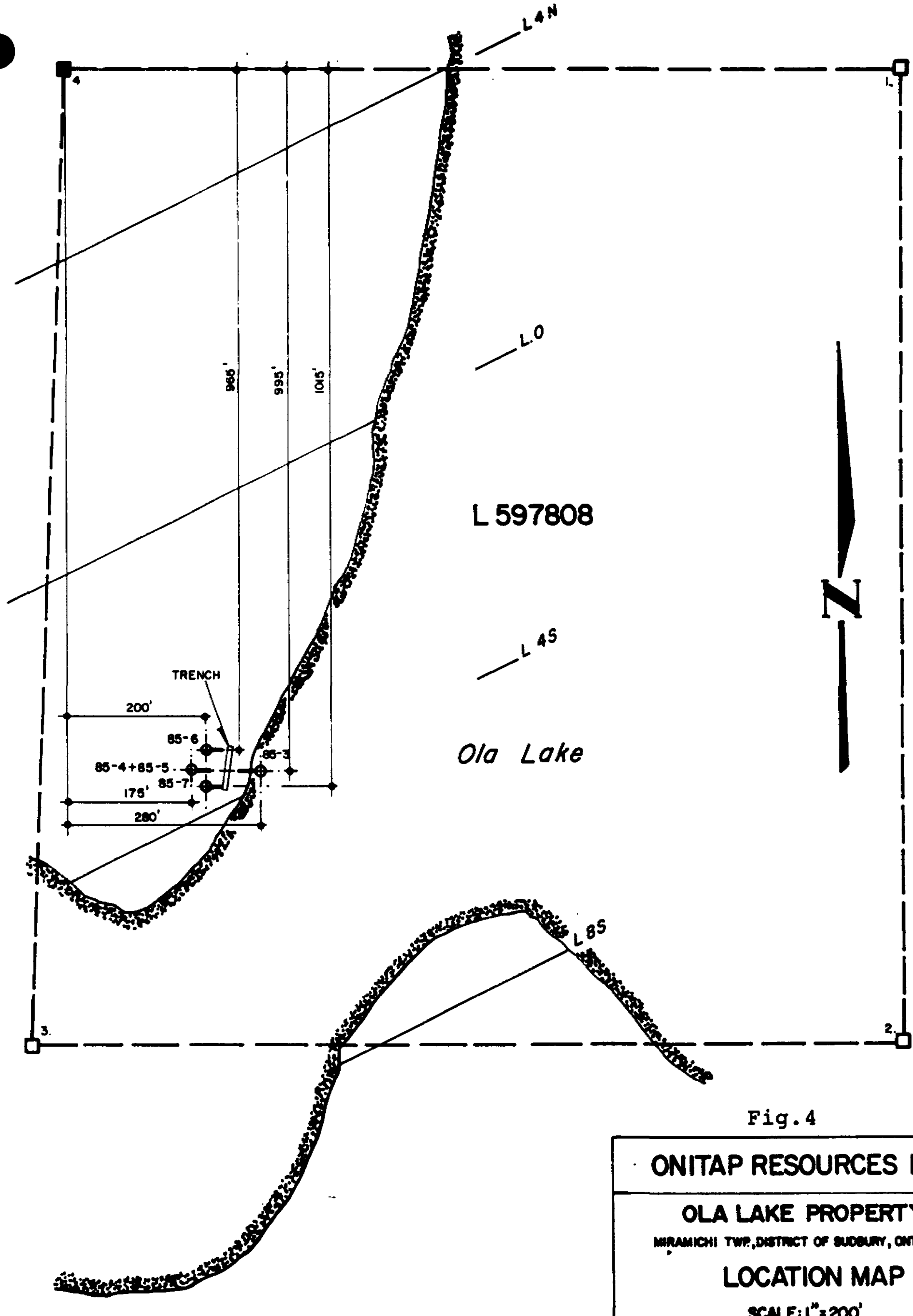


Fig.4

ONITAP RESOURCES INC.

OLA LAKE PROPERTY

MIRAMICHI TWP., DISTRICT OF SUDBURY, ONTARIO

LOCATION MAP

SCALE: 1" = 200'

NAREX Ore Search Consultants Inc.

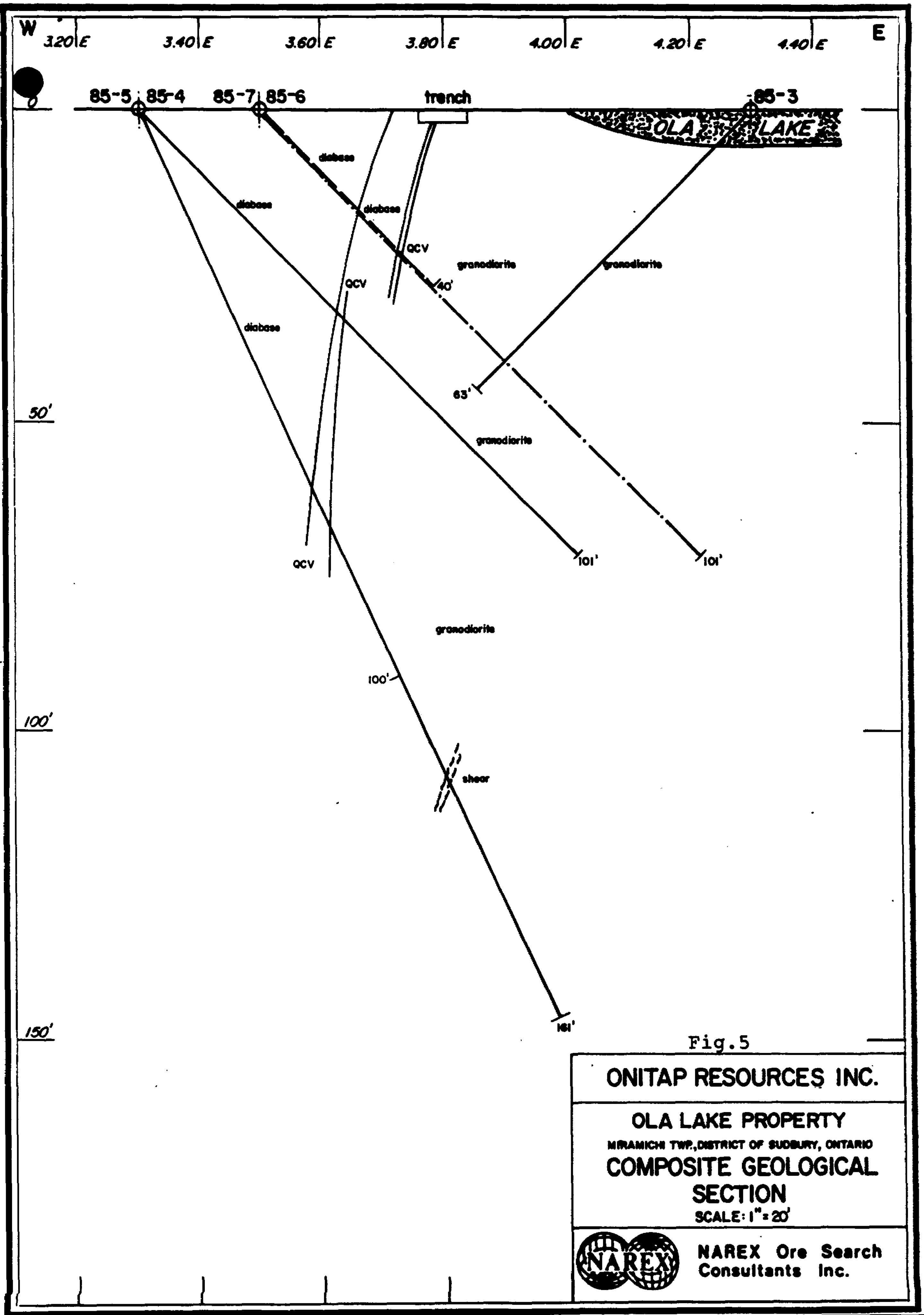


Fig.5

ONITAP RESOURCES INC.

OLA LAKE PROPERTY

MIRAMICHI TWP., DISTRICT OF SUDBURY, ONTARIO

COMPOSITE GEOLOGICAL SECTION

SCALE: 1" = 20'

NAREX Ore Search Consultants Inc.

The results from this drilling is discouraging. In the main section of three holes (85-3, 85-4, 85-5) the main vein located in the trench was not intersected in any of the holes. Another parallel vein (2" wide) which is located 5 feet within the granodiorite near the diabase contact was intersected in two holes. Assay values however indicate only trace Au values (26 ppb).

The section drilled 25 feet to the north intersected a QV (12" wide) within the granodiorite near the contact. This appears to coincide with the vein in the trench but indicates that the vein strikes N-S, but has narrowed from 5' wide to 1' wide in a lateral distance of 25 feet and that it dip 80° to the west. The assays indicate 5 ppb Au in the vein. The section drilled 30 feet to the south of the centre of the trench intersected a 3" wide QV in the contact zone of the diabase-granodiorite with a value of 67 ppb Au. A fairly extensive sheared section of granodiorite was also intersected (true thickness of 30 feet). However assays of this section indicate values of only 12 to 39 ppb Au.

E. CONCLUSIONS AND RECOMMENDATIONS

From the analysis of drill results it is concluded that the main Au bearing quartz vein is located within the granodiorite at/or near the granodiorite-diabase contact. However the main vein appears to pinch out with depth and laterally to both the north and south. The best result of the vein material gave only 67 ppb Au. Several sheared sections of granodiorite were also intersected but results from these indicated only values in the range of 12-39 ppb Au.

It is therefore recommended that the option be dropped and that the property be returned to the vendor.

Peter Born, M.Sc.
Project Geologist

NAREX

REFERENCES

Carter, M.W.

1979 - Miramichi Township, District of Sudbury; Ontario Geological Survey Prelim. Map. P.2208, Geol. Series, Scale 1:15,840 or 1 inch to 1/4 mile. Geology 1976.

APPENDIX B

ASSAY RESULTS

N.B. : Ola Lake samples denoted by 1000 numbers

VI.

ASSAYERS (ONTARIO) LIMITED

33 CHAUNCEY AVENUE TORONTO, ONTARIO M8Z 2Z2 · TELEPHONE (416) 239-3527

Certificate of Analysis

Certificate No. NX-32/ #3813 Date: February 15, 1985

Received Feb. 12/85 52 Samples of Drill Core

Submitted by Narex Ore Search Consultants Inc. Att'n: Dr. K. Naert

Sample No.	Au ppb	Sample No.	Au ppb	Sample No.	Au ppb
158	1240 *	178	170	1011	<5
159	221	179	75	1012	21
160	105	180	63	1013	33
161	51	181	21	1014	67
162	54	182	206	1015	<5
163	46	183	374	1016	16
164	130	184	46	1017	12
165	145	185	429	1018	<5
166	<5	186	33	1019	33
167	86	187	28	1020	39
168	57	1001	14	1021	23
169	12	1002	19	1022	9
170	560	1003	<5		
171	105	1004	19		
172	57	1005	28		
173	81	1006	26		
174	12	1007	33		
175	340	1008	21		
176	61	1009	28		
177	700	1010	16		

*158 - .039 oz/ton

ASSAYERS (ONTARIO) LIMITED

Per ______

J. van Engelen Mgr.

FEB - 4 Rec'd

Karol O. Mikulash, P.Eng.
130 TRACINA DRIVE
OAKVILLE, ONTARIO L6L 4B7
Res. (416) 827-5329

January 31, 1985.

Dr. Karl A. Naert
Narex Ore Search Consultants, Inc.
Suite 208,
4900 Sheppard Avenue East,
Scarborough, Ontario.
M1S 4A7

Re: Review of the testwork on the Ola Lake Au ore.

Dear Karl;

As per our conversation, here are a few thoughts about the Ola Lake gold ore:

The assays of the ore indicate a relatively high grade ore: .40 opt Au, .19 opt Ag and .88% Cu.

The testwork performed by the Lakefield Research Ltd. indicates that the ore is susceptible to any kind of ore treatment which in the metallurgical terms equals to a reasonable potential of profitable operation. Should the substantial ore reserves justify a capital spending, the following ore processing could be used:

1. The gravity concentration would be done by jigs. The Wilfley tables do not have the efficiency needed for producing a high grade concentrate having a ratio of concentration of 1 : 4. This amounts to too much material to be handled, and exposed to many unnecessary losses.
   The native (or visible)gold trapped, the fine material would enter flotation or the direct cyanidation. The former renders a saleable copper concentrate of 22.5 per cent Cu, 6.21 ozs/t Au. Recovery of copper is 93.98 % while that of gold amounts to 87.88% at mesh of grinding (MOG) 90% passing 200 mesh. These results indicate a relatively soft ore in terms of kilowatts per ton of ore in grinding.
   The flotation may be followed by the cyanidation of tailings although it is questionable whether the additional benefit of 8% Au recovery would justify the additional capital expenditure for the cyanidation plant at the present prices of gold.

2. The direct cyanidation approach, i.e. no flotation concentrates to be transported + smelting and refining chrges (and who cares for copper concentrates nowadays,anyway), is worthwhile of further investigation. It indicates a gold recovery in range of 93 %. Should further investigation prove that the consumption of cyanide and lime will not exceed the testwork-indicated levels (the relatively higher copper grade may cause a high copper and iron ion concentration in the gold bearing solutions, and as

such, may be detrimental to the process), then the overall gold recovery may be within 95 % (including the jigs, of course). Using the cyanidation process, the Ola Lake ore represents a tremendeous potential with a recoverable grade of .38 ozs/t Au, i.e. $ 114.00/ton of ore. With the mine operating cost of even $70.00/ton this represents a potential of $ 44.00/ton operating profit.

Having no ore reserves available, it is difficult to estimate the necessary capital for bringing the mine in operation, however, there are not too many mines in Canada which could claim this potential even at these depressed gold prices.

Yours truly,

Karol O. Mikulash, P. Eng.

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030

Karol O. Mike
130 TRACINA DRIVE
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Res. (416) 827-5329

January 31, 1985.

Dr. Karl A. Naert
Narex Ore Search Consultants, Inc.
Suite 208,
4900 Sheppard Avenue East,
Scarborough, Ontario.
M1S 4A7

Re: Review of the testwork on the Ola Lake Au ore.

Dear Karl;

As per our conversation, here are a few thoughts about the Ola Lake gold ore:

The assays of the ore indicate a relatively high grade ore: .40 opt Au, .19 opt Ag and .88% Cu.

The testwork performed by the Lakefield Research Ltd. indicates that the ore is susceptible to any kind of ore treatment which in the metallurgical terms equals to a reasonable potential of profitable operation. Should the substantial ore reserves justify a capital spending, the following ore processing could be used:

1. The gravity concentration would be done by jigs. The Wilfley tables do not have the efficiency needed for producing a high grade concentrate having a ratio of concentration of 1 : 4. This amounts to too much material to be handled, and exposed to many unnecessary losses.
   The native (or visible)gold trapped, the fine material would enter flotation or the direct cyanidation. The former renders a saleable copper concentrate of 22.5 per cent Cu, 6.21 ozs/t Au. Recovery of copper is 93.98 % while that of gold amounts to 87.88% at mesh of grinding (MOG) 90% passing 200 mesh. These results indicate a relatively soft ore in terms of kilowatts per ton of ore in grinding.
   The flotation may be followed by the cyanidation of tailings although it is questionable whether the additional benefit of 8% Au recovery would justify the additional capital expenditure for the cyanidation plant at the present prices of gold.

2. The direct cyanidation approach, i.e. no flotation concentrates to be transported + smelting and refining chrges (and who cares for copper concentrates nowadays, anyway), is worthwhile of further investigation. It indicates a gold recovery in range of 93 %. Should further investigation prove that the consumption of cyanide and lime will not exceed the testwork-indicated levels (the relatively higher copper grade may cause a high copper and iron ion concentration in the gold bearing solutions, and as

such, may be detrimental to the process), then the overall gold recovery may be within 95 % (including the jigs, of course). Using the cyanidation process, the Ola Lake ore represents a tremendeous potential with a recoverable grade of .38 ozs/t Au, i.e. $ 114.00/ton of ore. With the mine operating cost of even $70.00/ton this represents a potential of $ 44.00/ton operating profit.

Having no ore reserves available, it is difficult to estimate the necessary capital for bringing the mine in operation, however, there are not too many mines in Canada which could claim this potential even at these depressed gold prices.

Yours truly,

Karol O. Mikulash, P. Eng.

K. MIKULASH

An Investigation of

THE RECOVERY OF GOLD

from Ola Lake project samples

submitted by

NAREX ORE SEARCH CONSULTANTS INC.

Progress Report No. 1

Project No. L.R. 2918

NOTE:

This report refers to the samples as received.

The practice of this Company in issuing reports of this nature is to require the recipient not to publish the report or any part thereof without the written consent of Lakefield Research.

LAKEFIELD RESEARCH
A Division of Falconbridge Limited
Lakefield, Ontario
January 29, 1985

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INTRODUCTION

This report contains the results of testwork conducted on Ola Lake gold project samples as requested by Dr. C. Naert of Narex Ore Search Consultants Inc. The purpose of the testwork was to investigate the association of the gold in the sample and the recovery of the gold by gravity concentration, flotation and cyanidation.

The results were discussed in frequent telephone conversations with Dr. Naert.

LAKEFIELD RESEARCH

D.M. Wyslouzil, P. Eng.,

Manager

I. Jackman

Project Engineer

Experimental Work By: L. Paquette

SUMMARY

1. Head Analyses

A representative portion of the sample was removed and analysed for the elements shown below:

Gold (Au)	:	12.4 g/t
Silver (Ag)	:	5.8 g/t
Copper (Cu)	:	0.88 %

In addition, a semi-quantitative spectrographic analysis gave the following results.

Semi-Quantitative Spectrographic Analysis:

10 - 100 %	Si
0.3 - 3 %	Mg, Fe, Al, Cu
0.03 - 0.3 %	Ca
0.01 - 0.1 %	Na
0.003 - 0.03 %	Mn
0.001 - 0.01 %	Pb, Ti, Cr
0.0001 - 0.001 %	Ni, Ag

2. Gravity Concentration

The recovery of gold in a gravity concentrate was briefly examined. The ore was ground to 58 % minus 200 mesh and fed over a laboratory Wilfley table. The table concentrate was 25 % of the feed weight and assayed 23.4 g/t Au representing 78 % Au recovery. This concentrate was then amalgamated. The amalgam contained 46 % of the gold in the original ore.

3. Flotation Testwork

Flotation tests were conducted to investigate the recovery of gold in a copper concentrate.

A copper rougher concentrate was recovered using Aerofloat 208 and Minerec 200 at pH 10.5 and was water cleaned once. The results are tabulated in Table 1.

Summary - Continued

3. Flotation Testwork - Cont'd

Table No. 1 - Flotation Results

Test No.	% -200 mesh	Product	Weight %	Assays %, g/t		% Distribution	
				Cu	Au	Cu	Au
4	90	Cu Cleaner Conc.	3.2	26.9	230	93.1	87.0
		Cu Rougher Conc.	4.5	19.4	166	94.6	88.5
		Cu Rougher Tail.	95.5	0.052	1.42	5.4	11.5
		Head (Calc.)	100.0	0.92	8.45	-	-
8	76	Cu Cleaner Conc.	3.4	22.8	239	85.7	83.6
		Cu Rougher Conc.	5.8	13.7	148	87.6	88.3
		Cu Rougher Tail.	94.2	0.12	1.21	12.4	11.7
		Head (Calc.)	100.0	0.91	9.72	-	-

Increasing the fineness of grind improved the copper flotation both in terms of grade and recovery. The recovery of gold in the copper rougher concentrate was similar in both tests. The gold recovered in the copper concentrate would include the free gold present in the sample.

4. Cyanidation Testwork

4.1. Direct Cyanidation

Tests were performed to investigate the effect of fineness of grind and cyanide concentration on the recovery of gold by direct cyanidation of the ore. The leaches were conducted in bottles on rolls at pH 11 in a single 48-hour stage. The results are summarized in Table No. 2.

Summary - Continued

4.1. Direct Cyanidation - Cont'd

Table No. 2 - Cyanidation Results

Test No.	% -200 mesh	NaCN g/L	Reag. Cons., kg/t NaCN	CaO	Preg. Sol'n, mg/L Cu	Fe	% Rec'y Au	Residue g/t Au	Head g/t Au
1	58	0.5	1.12	0.26	158	19.3	64.6	3.03	8.55
2	58	1.0	2.66	0	187	120	92.8	0.76	10.5
6	90	0.5	1.89	0.08	185	86.0	76.9	1.96	8.49
7	90	1.0	3.21	0.02	220	186	92.5	0.71	9.50

Increasing the fineness of grind increased the cyanide consumption at both concentrations. At the higher cyanide concentration however, the extraction of gold was not improved by increasing the grind, indicating that liberation of the gold was not the limiting factor. Increasing the cyanide concentration to 1 g/L NaCN increased gold extraction to 93 % at both grinds. The cyanide consumptions also increased. The copper and iron in solution could account for over 80 % of the cyanide consumption at the coarser grind and over 90 % of consumption at the finer grind.

4.2. Cyanidation of the Flotation Tailing

The recovery of gold from the copper rougher tailing was investigated. The tailing samples were leached for 48 hours at 0.5 g/L NaCN in bottles on rolls. In Test No. 9, the tailing was aerated in lime water at pH 11 prior to cyanidation. Table No. 3 contains the results.

Table No. 3 - Cyanidation of the Flotation Tailing

Test No.	Feed %-200 M	% Cu	Preaer. hours	Reag. Cons. kg/t NaCN	CaO	Preg. Sol'n mg/L Cu	Fe	% Au Recovery Cy only	O'all	Residue g/t Au	Head g/t Au
5	90	0.05	0	1.47	0.13	65.5	73.6	73.1	8.4	0.36	1.34
9	76	0.12	6	0.44	0.34	53.4	3.35	61.0	7.1	0.43	1.10

Because of the differences in the feed to the two tests, the results are not strictly comparable. Nevertheless, the addition of a preaeration stage sharply reduced

Summary - Continued

4.2. Cyanidation of the Flotation Tailing - Cont'd

the level of iron in the pregnant solution reducing the consumption of cyanide. Both residue assays are lower than the best residue assay achieved by direct cyanidation, 0.7 g/t Au.

The results of these preliminary tests give the following overall gold recoveries by flotation of a copper concentrate with the subsequent cyanide leaching of the flotation tailing.

Tests Numbers	Products	% Au Recovery
4 + 5	Cu Cl. Conc. + Cyn. Sol'n	95
	Cu Ro. Conc. + Cyn. Sol'n	97
8 + 9	Cu Cl. Conc. + Cyn. Sol'n	91
	Cu Ro. Conc. + Cyn. Sol'n	95

SAMPLE PREPARATION

On December 4, 1984, one bag labelled SN 18760 was received at Lakefield Research and given our Reference number 8424945. The bag contained approximately 11 kg of ore from the Ola Lake Gold Project. The ore was crushed to minus 10 mesh. A head sample was removed and test charges were prepared.

DETAILS OF TESTS

Test No. 1

Purpose: To investigate the cyanidation response of sample 18760.

Procedure: The sample was pulped with water in a 2 liter bottle. NaCN and lime were added and the cyanidation was carried out on rolls in one 48 hour stage. The pulp was filtered and the residue washed three times with water.

Feed: 500 grams minus 10 mesh SN 18760.

Solution Volume: 1000 mL Pulp Density 33 % solids

Solution Composition: 0.50 gpL NaCN

pH Range: 10.5-11 with $Ca(OH)_2$

Grind: 15 min/kg at 50 % solids in a lab ball mill.

Reagent Balance:

Time Hours	Added, grams				Residual		Consumed		pH
	Actual		Equivalent		Grams		Grams		
	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO	
0-2	0.53	0.20	0.50	0.15	0.34	0.03	0.16	0.12	12.0-11.9
2-18.5	0.17	-	0.16	-	0.28	0.02	0.22	0.01	11.9-11.8
18.5-26	0.23	-	0.22	-	0.50	0.02	0	0	11.8-11.7
26-48	-	-	-	-	0.32	0.02	0.18	0	11.7-11.3
Total	0.93	0.20	0.88	0.15	0.32	0.02	0.56	0.13	-

Reagent Consumption (kg/t of cyanide feed) NaCN : 1.12
CaO : 0.26

Metallurgical Results

Product	Amount	Assays mg/L,g/t Au	% Distribution Au
48 h Preg. + Wash Sol'n	2030 mL	1.36	64.6
48 h Cyanide Residue	499.5 g	3.03	35.4
Head (Calc.)	499.5 g	8.55	100.0

Additional Assays: 48 h Preg. + Wash Sol'n - 77.6 mg/L Cu
9.50 mg/L Fe

Test No. 1 - Continued

Screen Analysis - 48 h Cyanide Residue

Mesh Size (Tyler)	% Retained Individual	% Retained Cumulative	% Passing Cumulative
+ 65	2.7	2.7	97.3
100	7.2	9.9	90.1
150	14.7	24.6	75.4
200	17.5	42.1	57.9
270	16.4	58.5	41.5
400	11.0	69.5	30.5
- 400	30.5	100.0	-
Total	100.0	-	-

Test No. 2

Purpose: To investigate the effect of a higher cyanide concentration on the recovery of gold from sample 18760.

Procedure: The sample was pulped with water in a 2 liter bottle. NaCN and lime were added and the cyanidation was carried out on rolls in one 48 hour stage. The pulp was filtered and the residue washed three times with water.

Feed: 500 g minus 10 mesh SN 18760

Solution Volume: 1000 mL Pulp Density 33 % solids

Solution Composition: 1.0 gpL NaCN

pH Range: 10.5-11.0 with $Ca(OH)_2$

Grind: 15 min/kg at 50 % solids in a lab ball mill

Reagent Balance:

Time Hours	Added, grams				Residual		Consumed		pH
	Actual		Equivalent		Grams		Grams		
	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO	
0-2	1.05	-	1.00	-	0.33	-	0.67	-	10.8-11.4
2-18.5	0.70	-	0.67	-	0.34	-	0.66	-	11.6-11.6
18.5-26	0.69	-	0.66	-	1.00	-	0	-	11.7-11.6
26-48	-	-	-	-	1.00	-	0	-	11.6-11.4
Total	2.44	0	2.33	0	1.00	0	1.33	0	-

Reagent Consumption (kg/t of cyanide feed) NaCN : 2.66
CaO : 0

Metallurgical Results

Product	Amount	Assays mg/L,g/t Au	% Distribution Au
48 h Preg. + Wash Sol'n	1980 mL	2.45	92.8
48 h Residue	499.0 g	0.76	7.2
Head (Calc.)	499.0 g	10.46	100.0

Additional Assays: 48 h Preg. + Wash Sol'n - 94.6 mg/L Cu
60.6 mg/L Fe

Test No. 3

Purpose: To recover the free gold from sample 18760 by gravity separation followed by amalgamation of the concentrate.

Procedure: The sample was passed over a Wilfley table. The tailing was collected and filtered. The concentrate was pulped with water in a 1 liter bottle. Mercury and sodium hydroxide were added. The bottle was placed on rolls for 2 hours. The mercury was then recovered by elutriation in a 2 liter separatory funnel.

Feed: 1000 grams minus 10 mesh sample 18760.

Grind: 15 minutes/kg at 50 % solids in a lab ball mill.

Metallurgical Results

Product	Weight %	Assays mgs, g/t Au	% Distribution Au
1. Hg Amalgam	-	3.471	46.3
2. Amalgam Tail.	25.3	9.45	31.4
3. Table Tail.	64.7	2.28	22.3
Head (Calculated)	100.0	7.64	100.0

Calculated Grades and Recoveries

Products 1 and 2	25.3	23.4	77.7

Test No. 4

Purpose: To investigate the recovery of gold in a copper concentrate.

Procedure: As outlined below.

Feed: 1000 grams SN 18760.

Grind: 30 minutes/kg at 50 % solids in a lab ball mill.

Conditions:

Stage	Reagents Added, grams/tonne				Time, minutes		pH
	R208	M200	$Ca(OH)_2$	MIBC	Cond.	Froth	
Rougher	20	10	380	10	2	5	10.5
Cleaner	-	-	70	-	2	8	10.5

Stage	Rougher	Cleaner
Flotation Cell	500 g D-1	250 g D-1
Speed rpm	1800	1000

Metallurgical Results

Product	Weight %	Assays %, g/t		% Distribution	
		Cu	Au	Cu	Au
1. Cleaner Concentrate	3.2	26.9	230	93.1	87.0
2. Cleaner Tailing	1.3	1.10	9.65	1.5	1.5
3. Rougher Tailing	95.5	0.052	1.42	5.4	11.5
Head (Calculated)	100.0	0.92	8.45	100.0	100.0

Calculated Grades and Recoveries

Products 1 and 2	4.5	19.4	166	94.6	88.5

Test No. 5

Purpose: To investigate the cyanidation response of the flotation rougher tailing.

Procedure: The sample was pulped with water in a 2 liter bottle. NaCN and lime were added and the cyanidation was carried out on rolls in one 48 hour stage. The pulp was filtered and the residue washed three times with water.

Feed: 500 g rougher tailing from Test 4

Solution Volume: 1000 mL Pulp Density 33 % solids

Solution Composition: 0.50 gpL NaCN

pH Range: 10.5-11.0 with $Ca(OH)_2$

Reagent Balance:

Time Hours	Added, grams				Residual		Consumed		pH
	Actual		Equivalent		Grams		Grams		
	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO	
0-2.5	0.53	0.12	0.50	0.09	0.10	0.04	0.40	0.05	11.1-11.2
2.5-6.5	0.42	-	0.40	-	0.34	0.03	0.16	0.01	11.2-11.2
6.5-24	0.17	-	0.16	-	0.50	0.03	0	0	11.0-11.0
24-48	0	0	0	0	0.45	0.03	0.05	0	11.0-11.0
Total	1.12	0.12	1.06	0.09	0.45	0.03	0.61	0.06	-

Reagent Consumption (kg/t of cyanide feed) NaCN : 1.47
CaO : 0.13

Metallurgical Results

Product	Amount	Assays mg/L,g/t Au	% Distribution Au	
			Ind.	O'all
48 h Preg. + Wash Sol'n	1770 mL	0.25	73.1	8.4
48 h Residue	451.7 g	0.36	26.9	3.1
Head (Calculated)	451.7 g	1.34	100.0	11.5

Additional Assays 48 h Preg. + Wash Sol'n - 37.0 mg/L Cu
41.6 mg/L Fe

O'all Au recovery by flotation and cyanidation:

Cu Cl. Conc. + Cyn. - 95.4 %
Cu Ro. Conc. + Cyn. - 96.9 %

Test No. 6

Purpose: To investigate the effect of a finer grind on the recovery of gold from sample 18760.

Procedure: The sample was pulped with water in a 2 liter bottle. NaCN and lime were added and the cyanidation was carried out on rolls in one 48 hour stage. The pulp was filtered and the residue washed three times with water.

Feed: 500 g minus 10 mesh Sample 18760

Solution Volume: 1000 mL Pulp Density 33 % solids

Solution Composition: 0.50 gpL NaCN

pH Range: 10.5-11.0 with $Ca(OH)_2$

Grind: 30 minutes/kg at 50 % solids in a lab ball mill

Reagent Balance:

Time Hours	Added, grams				Residual		Consumed		pH
	Actual		Equivalent		Grams		Grams		
	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO	
0-2.5	0.53	0.10	0.50	0.08	0.06	0.04	0.44	0.04	10.7-10.9
2.5-6.5	0.46	-	0.44	-	0.28	0.04	0.22	0	10.9-10.9
6.5-24	0.23	-	0.22	-	0.39	0.04	0.11	0	10.9-10.9
24-48	0.12	-	0.11	-	0.33	0.04	0.17	0	11.0
Total	1.34	0.10	1.27	0.08	0.33	0.04	0.94	0.04	-

Reagent Consumption (kg/t of cyanide feed) NaCN : 1.89
CaO : 0.08

Metallurgical Results

Product	Amount	Assays mg/L, g/t Au	% Distribution Au
48 h Preg. + Wash	1870 mL	1.74	76.9
48 h Residue	498.0 g	1.96	23.1
Head (Calc.)	498.0 g	8.49	100.0

Additional Assays 48 h Preg. + Wash Sol'n = 98.8 mg/L Cu
46.0 mg/L Fe

Test No. 6 - Continued

Screen Analysis - Residue

Mesh Size (Tyler)	% Retained Individual	% Retained Cumulative	% Passing Cumulative
+ 65	0.2	0.2	99.8
100	0.3	0.5	99.5
150	2.0	2.5	97.5
200	7.0	9.5	90.5
270	12.9	22.4	77.6
400	18.0	40.4	59.6
- 400	59.6	100.0	-
Total	100.0	-	-

Test No. 7

Purpose: To investigate the effect of a finer grind and a higher cyanide concentration on the recovery of gold from sample 18760.

Procedure: As for Test 6.

Feed: 500 g minus 10 mesh Sample 18760.

Solution Volume: 1000 mL Pulp Density 33 % solids

Solution Composition: 1.0 gpL NaCN

pH Range: 10.5-11.0 with $Ca(OH)_2$

Grind: 30 minutes/kg at 50 % solids in a lab ball mill.

Reagent Balance:

Time Hours	Added, grams				Residual		Consumed		pH
	Actual		Equivalent		Grams		Grams		
	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO	
0-2.5	1.05	0.08	1.00	0.06	0.05	0.05	0.95	0.01	10.6-11.3
2.5-6.5	1.00	-	0.95	-	0.65	0.05	0.35	0	11.3-11.4
6.5-24	0.37	-	0.35	-	0.89	-	0.11	-	11.3-11.3
24-48	0.12	-	0.11	-	0.80	0.05	0.20	0	11.5
Total	2.54	0.08	2.41	0.06	0.80	0.05	1.61	0.01	-

Reagent Consumption (kg/t of cyanide feed) NaCN : 3.21
CaO : 0.02

Metallurgical Results

Product	Amount	Assays mg/L,g/t Au	% Distribution Au
48 h Preg. + Wash	1820 mL	2.42	92.5
48 h Residue	500.7 g	0.71	7.5
Head (Calc.)	500.7 g	9.50	100.0

Additional Assays: 48 h Preg. + Wash Sol'n = 121 mg/L Cu
102 mg/L Fe

Test No. 8

Purpose: To investigate the effect of a coarser grind on the recovery of gold in a copper concentrate.

Procedure: As outlined below.

Feed: 1000 grams minus 10 mesh SN 18760.

Grind: 22 minutes/kg at 50 % solids in a lab ball mill.

Conditions:

Stage	Reagents Added, grams/tonne				Time, minutes		pH
	R208	M200	$Ca(OH)_2$	MIBC	Cond.	Froth	
Rougher	20	10	380	10	2	5	10.7
Cleaner	-	-	70	-	2	8	10.4

Stage	Rougher	Cleaner
Flotation Cell	500 g D-1	250 g D-1
Speed rpm	1800	1000

Metallurgical Results

Product	Weight %	Assays g/t, %		% Distribution	
		Cu	Au	Cu	Au
1. Cleaner Conc.	3.4	22.8	239	85.7	83.6
2. Cleaner Tail.	2.4	0.70	19.0	1.9	4.7
3. Rougher Tail.	94.2	0.12	1.21	12.4	11.7
Head (Calc.)	100.0	0.91	9.72	100.0	100.0

Calculated Grades and Recoveries

Products 1 and 2	5.8	13.7	148	87.6	88.3

Test No. 8 - Continued

Screen Analysis - Rougher Tailing

Mesh Size (Tyler)	% Retained Individual	% Retained Cumulative	% Passing Cumulative
+ 65	0.5	0.5	99.5
100	2.1	2.6	97.4
150	7.7	10.3	89.7
200	13.9	24.2	75.8
270	17.1	41.3	58.7
400	15.7	57.0	43.0
- 400	43.0	100.0	-
Total	100.0	-	-

Test No. 9

Purpose: To investigate the effect of preaeration on the recovery of gold from the flotation rougher tailing.

Procedure: The sample was pulped with water in a 2 liter bottle. Lime was added and the sample was preaerated on rolls for 6 hours maintaining a pH of 11.0. NaCN was added and the cyanidation was carried out on rolls in one 48 hour stage. The pulp was filtered and the residue washed three times with water.

Feed: 500 g flotation rougher tailing Test 8.

Solution Volume: 1000 mL Pulp Density 33 % solids

Solution Composition: 0.50 gpL NaCN

pH Range: 10.5-11.0 with $Ca(OH)_2$

Reagent Balance:

Time Hours	Added, grams				Residual		Consumed		pH
	Actual		Equivalent		Grams		Grams		
	NaCN	$Ca(OH)_2$	NaCN	CaO	NaCN	CaO	NaCN	CaO	
Preaeration									
0-1	-	0.13	-	0.10	-	-	-	-	11.0-10.3
1-6	-	0.06	-	0.05	-	-	-	-	11.0-10.5
Cyanidation									
0-2.5	0.53	-	0.50	-	0.44	0.01	0.06	0.14	10.8-10.7
2.5-18	0.06	0.04	0.06	0.03	0.49	0.02	0.01	0.02	11.0-10.8
18-48	-	-	-	-	0.34	0.01	0.15	0.01	10.8-10.5
Total	0.59	0.23	0.56	0.18	0.34	0.01	0.22	0.17	-

Reagent Consumption (kg/t of cyanide feed) NaCN : 0.44
CaO : 0.34

Test No. 9 - Continued

Metallurgical Results

Product	Amount	Assays mg/L,g/t Au	% Distribution Au Ind.	% Distribution Au O'all
48 h Preg. + Wash	1860 mL	0.18	61.0	7.1
48 h Residue	498.3 g	0.43	39.0	4.6
Head (Calc.)	498.3 g	1.10	100.0	11.7

Additional Assays: 48 h Preg. + Wash = 28.7 mg/L Cu
1.80 mg/L Fe

O'all Au Recovery by flotation and cyanidation:

Cu Cl. Conc. + Cyn. = 90.7 %
Cu Ro. Conc. + Cyn. = 94.7 %

LAKEFIELD RESEARCH
Lakefield, Ontario
January 29, 1985 / sem

REPORT ON THE

INDUCED POLARIZATION

AND RESISTIVITY SURVEY

AT THE

SHININGTREE PROPERTY,

CHURCHILL AND ASQUITH TOWNSHIPS

SUDBURY MINING DISTRICT, ONTARIO

FOR

ONITAP RESOURCES INC.

---

1. INTRODUCTION

At the request of Dr. K.A. Naert, Vice-President of the company, we have completed a brief phase induced polarization and resistivity survey on the Gosselin Claim Group, on behalf of Onitap Resources Inc. The property lies just to the north of the town of Shiningtree, Ontario in Churchill Township and Asquith Township. It lies within the Sudbury Mining District.

Considerable geologic exploration, including trenching and drilling have been completed on the claim group. Numerous occurrences of gold-bearing sulphide mineralization have been noted in the area of interest. The bedrocks in the area of interest are primarily ultramafic and intermediate metavolcanic rocks and related volcano-sedimentary rocks. Alteration (silicification, chloritization, sericitization, etc.) are widespread, particularly in the basaltic rocks and the andesitic rocks.

The most important gold deposit, located to date, is at depth in the vicinity of Line 14N, at the baseline. At this point, the drilling has intersected a quartz feldspar porphyry intrusive body, at depth. At the contact between the intrusive and the basalt country rock, both rock types are intensely seritized and silicified. A gold-bearing sulphide zone (5-10% metallic mineralization) lies within this zone of intense alteration.

The phase induced polarization and resistivity survey at the Shiningtree Property was planned to determine the electrical parameters associated with this zone of known mineralization. The measurements were then extended into adjoining areas of favourable rocks in an attempt to locate any other zones of similar mineralization that might be present.

2. PRESENTATION OF RESULTS

The phase induced polarization and resistivity results are shown on the following enclosed data plots. The field results have been plotted using the pseudo-section format.

Line No. 24+00N	100'	electrode	intervals	Dwg.No. IP5404-1
Line No. 20+00N	100'	"	"	Dwg.No. IP5404-2
Line No. 16+00N	100'	"	"	Dwg.No. IP5404-3
Line No. 14+00N	100'	"	"	Dwg.No. IP5404-4
Line No. 12+00N	100'	"	"	Dwg.No. IP5404-5
Line No. 8+00N	100'	"	"	Dwg.No. IP5404-6
Line No. 4+00N	100'	"	"	Dwg.No. IP5404-7
Line No. 0+00	100'	"	"	Dwg.No. IP5404-8
Line No. 4+00S	100'	"	"	Dwg.No. IP5404-9
Line No. 8+00S	100'	"	"	Dwg.No. IP5404-10
Line No. 12+00S	100'	"	"	Dwg.No. IP5404-11
Line No. 16+00S	100'	"	"	Dwg.No. IP5404-12

Line No. 20+00S	100'	"	"	Dwg.No. IP5404-13
Line No. 24+00S	100'	"	"	Dwg.No. IP5404-14
Line No. 28+00S	100'	"	"	Dwg.No. IP5404-15
Line No. 32+00S	100'	"	"	Dwg.No. IP5404-16

Also enclosed with this report is Dwg.I.P.P. 4139. a plan map of the Shiningtree Property Grid at a scale of 1" = 200'. The definite, probable and possible Induced Polarization anomalies are indicated by bars, in the manner shown on the legend, on this plan map as well as on the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the Induced Polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the electrode interval length; i.e. when using 100' electrode intervals the position of a narrow sulphide body can only be determined to lie between two stations 100' apart. In order to definitely locate, and fully evaluate, a narrow, shallow source it is necessary to use shorter electrode intervals. In order to locate sources at some depth, larger electrode intervals must be used, with a corresponding increase in the uncertainties of location. Therefore, while the centre of the indicated anomaly probably corresponds fairly well with source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

The topographic and geologic information shown on Dwg.I.P.P.4139 has been taken from maps made available by the staff of Onitap Resources Inc.

3. DISCUSSION OF RESULTS

The lines surveyed using Phase IP and Resistivity at the Shiningtree Property were relatively short. The measurements were confined to the vicinity of the baseline, where the previous geologic examinations had confirmed that favourable conditions were present.

At the north end of the grid, the apparent resistivity results show that the silicification has reduced the porosity of the rocks; the apparent resistivity values are high. Further, in the region west of the baseline on Line 24+00N, Line 20+00N, Line 16+00N, Line 14+00N, Line 12+00N, the apparent resistivity results suggest that the intensely silicified zone at the contact between the basalts and the quartz feldspar porphyry intrusive has a very high resistivity.

This can be clearly seen on Line 14+00N, where the drill hole section is available. Unfortunately, the presence of the small lake to the east make it impossible to complete the pseudo-section pattern. The sulphide mineralization within the high resistivity rocks results in an IP phase high. Exactly the same anomalous pattern is outlined to the north on Line 16+00N and to the south on Line 12+00N.

A second anomaly, with exactly the same characteristics, is located on Line 16+00N, to the east of the small lake. Both the apparent resistivities and the phase IP effects, are large in magnitude. Unfortunately, Line 14+00N and Line 12+00N were not surveyed to the east of the lake.

A similar anomalous feature has been outlined at 6+00E to 10+00E on Line 24+00S. Only weakly anomalous effects were detected on the lines four hundred feet to the north and to the south.

In addition to the broad anomalies described above, there are a few locations where relatively definite, narrow IP anomalies correlate with resistivity lows. The two most important of these are:

Line 4+00N; 6+00W to 4+50W

Line 12+00S; 11+50E to 13+50E

As outlined in the Appendix to this report, the source of this type of narrow, shallow anomaly can be better located and more fully evaluated by making detailed measurements using shorter electrode intervals.

4. CONCLUSIONS AND RECOMMENDATIONS

The known gold-bearing sulphide mineralization in the silicified zone intersected by drilling on Line 4+00N appears to give rise to high apparent resistivities (due to reduced porosity) and high IP effects. The mineralization appears to have some lateral extent. There is a second, exactly similar, anomaly to the east of the small lake on Line 16+00N. In addition, there are two narrow, shallow IP anomalies that correlate with apparent resistivity lows.

Detailed IP measurements would be warranted in each of these areas:

i) a) Survey Line 14+00N; 7+00W to 1+50E using X = 60'

b) Survey Line 16+00N; 7+00W to 1+50E using X = 60'

c) Survey Line 12+00W; 7+00W to 1+50E using X = 60'

d) Survey Line 2+00W;20+00N to 8+00N using X = 60'

ii) a) Survey Line 16+00N; 3+50E to 12+00E using X = 60'

b) Survey Line 18+00N; 3+50E to 12+00E using X = 60'

c) Survey Line 12+00N; 3+50E to 12+00E using X = 60'

d) Survey Line 8+00E;20+00N to 8+00N using X = 60'

iii) a) Survey Line 4+00N; 5+00W; one set-up with X = 60'

b) Repeat with X = 35' if still shallow

c) Survey Line 6+00N

d) Survey Line 2+00N

iv) a) Survey Line 12+00S; 12+00E; one set-up with X = 60'

b) Repeat with X = 35' if still shallow

c) Survey Line 10+00S

d) Survey Line 14+00S

- -

When these detailed results are available, they should be corrected carefully with the available geological information to determine if further drilling, and/or trenching, are warranted.

PHOENIX GEOPHYSICS LIMITED

Philip G. Hallof, Ph.D., P.Eng.
Geophysicist

REGISTERED PROFESSIONAL ENGINEER P. G. HALLOF PROVINCE OF ONTARIO

Dated: July 5, 1985

STATEMENT OF COST

ONITAP RESOURCES INC. - I.P. SURVEY

SHINING TREE AREA OF ONTARIO

Crew: J. Marsh - D. Daggett

Period: May 23 - June 2, 1985

11 Operating days	@ $575.00/day	$ 6,325.00
1 Organization) 1 Bad weather) 4 days - 2 Travel days)	@ $375.00/day	$ 1,500.00
Mobilization - Demobilization		$ 400.00
Local Transportation - 13 days @ $ 55.00/day		$ 715.00

EXPENSES:

Fares	$ 54.00	
Meals & Accommodation	$490.00	
Supplies	$ 70.18	
	$614.18	
+ 15%	$ 92.13	$ 706.31
		$ 9,646.31

PHOENIX GEOPHYSICS LIMITED

Philip G. Hallof, Ph.D., P.Eng.
Geophysicist

REGISTERED PROFESSIONAL ENGINEER
P. G. HALLOF
PROVINCE OF ONTARIO

DATED: July 5, 1985

ASSESSMENT DETAILS

PROPERTY: Gosselin

SPONSOR: ONITAP RESOURCES INC. PROVINCE: Ontario

LOCATION: Shining Tree Area

TYPE OF SURVEY: Induced Polarization and Resistivity

OPERATING MAN DAYS:	22.0	DATE STARTED:	May 23, 1985
EQUIVALENT 8-HR MAN DAYS:	33.0	DATE FINISHED:	June 2, 1985
CONSULTING MAN DAYS:	3.0	NUMBERS OF STATIONS:	304
DRAFTING MAN DAYS:	5.0	NUMBERS OF READINGS:	2,610
TOTAL MAN DAYS:	41.0	MILES OF LINES SURVEYED:	5.4 miles

CONSULTANTS:

P. G. Hallof, Ph.D., 3505-2045 Lakeshore Blvd., W., Toronto, Ontario

FIELD TECHNICIANS:

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D. Daggett, 35 Falcon Crescent, Chelmsford, Ontario POM 1LO

CARTOGRAPHERS:

R. C. Norris, 2499 Linwood Street., Pickering, Ontario

DATED: July 5, 1985

PHOENIX GEOPHYSICS LIMITED

Philip G. Hallof, Ph.D., P.Eng.
Geophysicist

REGISTERED PROFESSIONAL ENGINEER
P. G. HALLOF
PROVINCE OF ONTARIO

CERTIFICATE

I, Philip G. Hallof, of the City of Toronto, do hereby certify that:

1. I am a geophysicist residing at Suite 3505, 2045 Lakeshore Blvd., W. Toronto, Ontario.

2. I am a graduate of the Massachusetts Institute of Technology with a B.Sc. Degree (1952) in Geology and Geophysics, and a Ph.D. Degree (1957) in Geophysics.

3. I am a member of the Society of Exploration Geophysicists and the European Association of the Exploration Geophysicists.

4. I am a Professional Geophysicist, registered in the Province of Ontario, The Province of British Columbia and The State of Arizona.

5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly, in the properties or securities of Onitap Resources Inc., or any affiliate.

6. The statements made in this report are based on a study of published geological literature and unpublished private reports.

7. Permission is granted to use in whole or in part for assessment and qualification requirements but not for advertising purposes.

Dated at Toronto

This 5th day of July, 1985

Philip G. Hallof

REGISTERED PROFESSIONAL ENGINEER
P. G. HALLOF
PROVINCE OF ONTARIO

Philip G. Hallof, Ph.D. P.Eng.
Geophysicist

PHOENIX GEOPHYSICS LIMITED

NOTES ON THE THEORY, METHOD OF FIELD OPERATION, AND PRESENTATION OF DATA FOR THE INDUCED POLARIZATION METHOD

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic solution conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground water, The group of minerals commonly described as "metallic", however, have specific resistivities much lower than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present in the rock.

The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a d.c. current is allowed to flow through the rock; i.e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces, to appreciably reduce the amount of current flow through the metallic particle. This polarization takes place at each of the infinite number of solution-metal interfaces in a mineralized rock.

When the d.c. voltage used to create this d.c. current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the per cent frequency effect or F.E. are a measurement of the polarization in the rock mass. However, since the measurement of the degree of polarization is related to the apparent resistivity of the rock mass it is found that the metal factor values or M.F. are the most useful values in determining the amount of polarization present in the rock mass. The MF values are obtained by normalizing the F.E. values for varying resistivities.

The induced polarization measurement is perhaps the most powerful geophysical method for the direct detection of metallic sulphide mineralization, even when this mineralization is of very low concentration. The lower limit of volume per cent sulphide necessary to produce a recognizable IP anomaly will vary with the geometry and geologic environment of the source, and the method of executing the survey. However, sulphide mineralization of less than one per cent by volume has been detected by the IP method under proper geological conditions.

The greatest application of the IP method has been in the search for disseminated metallic sulphides of less than 20% by volume. However, it has also been used successfully in the search for massive sulphides in situations where, due to source geometry, depth of source, or low resistivity of surface layer, the EM method cannot be successfully applied. The ability to differentiate ionic conductors, such as water filled shear zones, makes the IP method a useful tool in checking EM anomalies which are suspected of being due to these causes.

In normal field applications the IP method does not differentiate between the economically important metallic minerals such as chalcopyrite, chalcocite, molybdenite, galena, etc., and the other metallic minerals such as pyrite. The induced polarization effect is due to the total of all electronic conducting minerals in the rock mass. Other electronic conducting materials which can produce an IP response are magnetite, pyrolusite, graphite, and some forms of hematite.

In the field procedure, measurements on the surface are made in a way that allows the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points in distance (X) apart. The potentials are measured at two points (X) feet apart, in line with the current electrodes is an integer number (n) times the basic distance (X).

The measurements are made along a surveyed line, with a constant distance (nX) between the nearest current and potential electrodes. In most surveys, several traverses are made with various values of (n); i.e. (n) = 1,2,3,4, etc. The kind of survey required (detailed or reconnaissance) decides the number of values of (n) used.

In plotting the results, the values of apparent resistivity, apparent per cent frequency effect, and the apparent metal factor measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and the other from the center point of the potential electrodes. (See Figure A). The resistivity values are plotted at the top of the data profile, above the percent frequency effect. On a third line, below the percent frequency effect, are plotted the values of the metal factor values. The lateral displacement of a given value is determined by the location along the survey line of the center point between the current and potential electrodes. The distance of the value from the line is determined by the distance (nX) between the current and potential electrodes when the measurement was made.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. The plots then, when contoured, are not section maps of the electrical properties of the ground under the survey line. The interpretation of the results from any given survey must be carried out using the combined experience gained from field results, model study results and the theoretical investigations. The position of the electrodes when anomalous values are measured is important in the interpretation.

In the field procedure, the interval over which the potential differences are measured is the same as the interval over which the electrodes are moved after a series of potential readings has been made.

One of the advantages of the induced polarization method is that the same equipment can be used for both detailed and reconnaissance surveys merely by changing the distance (X) over which the electrodes are moved each time. In the past, intervals have been used ranging from 25 feet to 2000 feet for (X). In each case, the decision as to the distance (X) and the values of (n) to be used is largely determined by the expected size of the mineral deposit being sought, the size of the expected anomaly and the speed with which it is desired to progress.

The diagram in Figure A demonstrates the method used in plotting the results. Each value of the apparent resistivity, apparent percent frequency effect, and apparent metal factor effect is plotted and identified by the position of the four electrodes when the measurement was made. It can be seen that the values measured for the larger values of (n) are plotted farther from the line indicating that the thickness of the layer of the earth that is being tested is greater than for the smaller values of (n); i.e. the depth of the measurement is increased.

The IP measurement is basically obtained by measuring the difference in potential or voltage (ΔV)obtained at two operating frequencies. The voltage is the product of the current through the ground and the apparent resistivity of the ground. Therefore in field situations where the current is very low due to poor electrode contact, or the apparent resistivity is very low, or a combination of the two effects; the value of (ΔV) the change in potential will be too small to be measurable. The symbol "TL" on the data plots indicates this situation.

In some situations spurious noise, either man made or natural, will render it impossible to obtain a reading. The symbol "N" on the data plots indicates a station at which it is too noisy to record a reading. If a reading can be obtained, but for reasons of noise there is some doubt as to its accuracy, the reading is bracketed in the data plot ( ).

In certain situations negative values of Apparent Frequency Effect are recorded. This may be due to the geologic environment or spurious electrical effects. The actual negative frequency effect value recorded is indicated on the data plot, however, the symbol "NEG" is indicated for the corresponding value of Apparent Metal Factor. In contouring negative values the contour lines are indicated to the nearest positive value in the immediate vicinity of the negative value.

The symbol "NR" indicates that for some reason the operator did not attempt to record a reading although normal survey procedures would suggest that one was required. This may be due to inaccessible topography or other similar reasons. Any symbol other than those discussed above is unique to a particular situation and is described within the body of the report.

PHOENIX GEOPHYSICS LIMITED.

METHOD USED IN PLOTTING DIPOLE-DIPOLE INDUCED POLARIZATION AND RESISTIVITY RESULTS

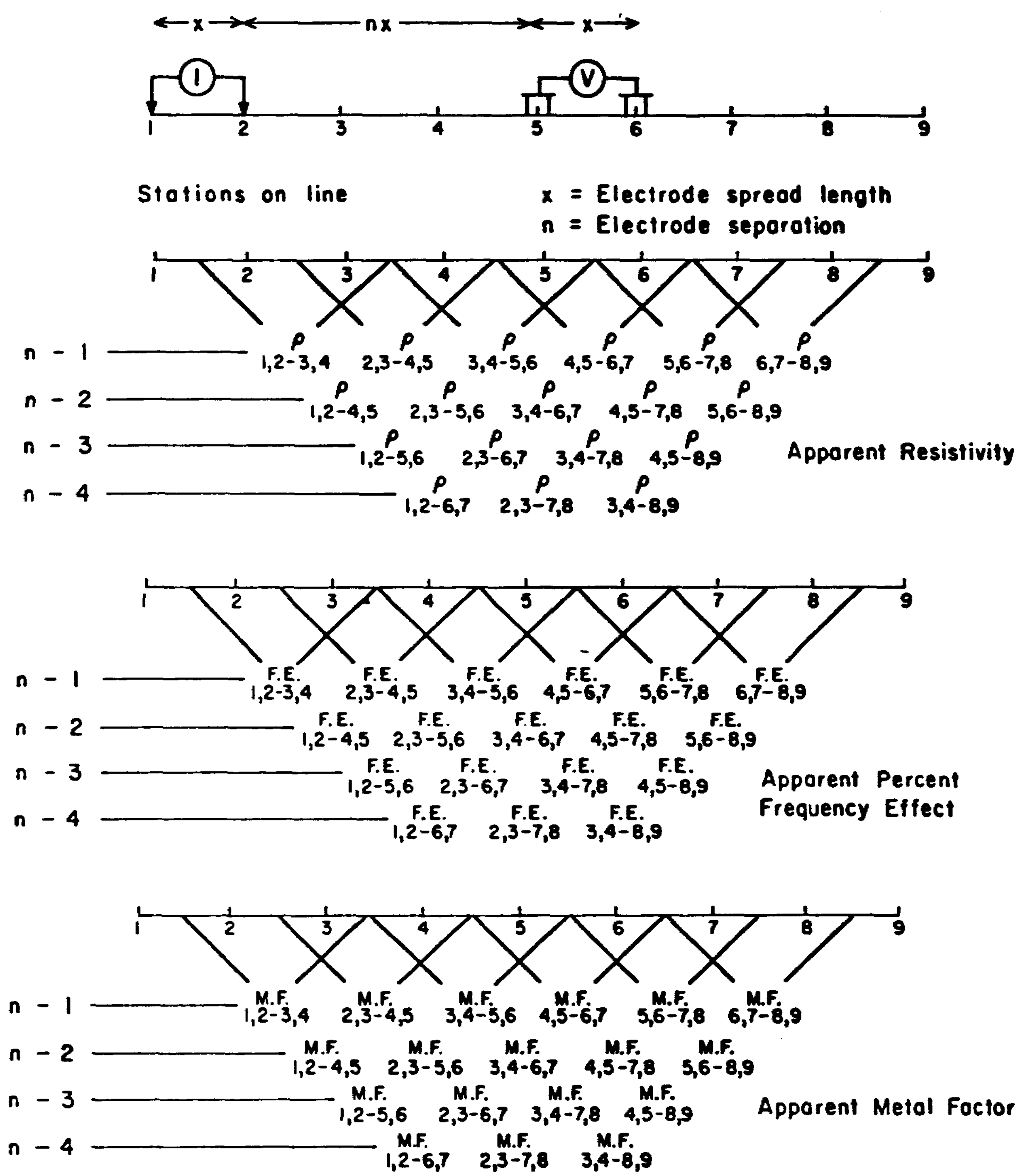

Fig. A

NAREX

NAREX Ore Search Consultants Inc.

41P11SE0041 63.4978 CHURCHILL

060

OMEP

NRX: 85-06

ONITAP RESOURCES INC.

REPORT ON DIAMOND DRILL PROGRAM 1985

Gosselin Claims

Asquith Township

LARDER LAKE MINING DIVISION

District of Sudbury

Ontario

March - 1985

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Accompanying map:

Map - Fig. 3 - Generalized geological Cross-section
GOSSELIN PROPERTY

NAREX

A) INTRODUCTION

This report for Onitap Resources Inc. covers diamond drilling during Jan-Feb. 1985, on one (1) claim in Asquith Township, Larder Lake Division, District of Sudbury, Ontario. This is part of a larger block of 49 contiguous claims which is made up of the Gosselin and Gibson properties. The claim on which the work was done is L 512315.

B) LOCATION AND ACCESS

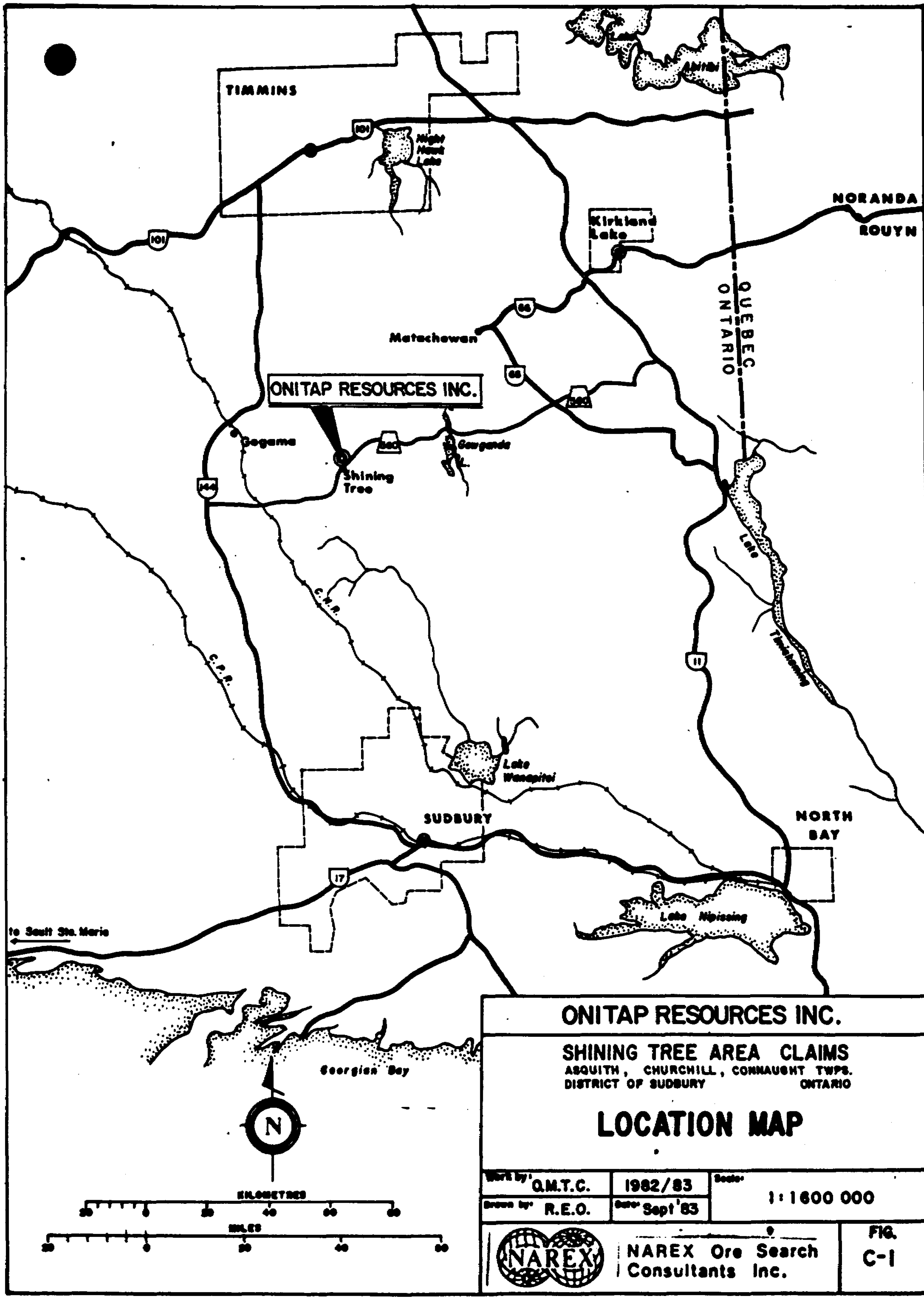
The Shining Tree area is located in the District of Sudbury, 77 miles due north of Sudbury or 65 miles south of Timmins. (Fig. C-1)

Access is via secondary roads from the main Timmins-to-Sudbury highway #144. Secondary highway #560, bisects the area of interest. The Village of Shining Tree is located within this area.

Shining Tree is a community of some 50 residents, hosting a general store, several gas stations and three tourist camps. The nearest float plane base is at Gogama on highway #144, some 23 air miles to the northwest. The regional Ministry of Natural Resources offices and base are located at Gogama.

The claims are located in northeastern Asquith Township and in the southern part of Churchill Township, east of highway #560 and about one mile east of the Village of Shining Tree, Ontario. Access to the property is by a series of bush roads which lead to highway #560.

.../..



ONITAP RESOURCES INC.

SHINING TREE AREA CLAIMS

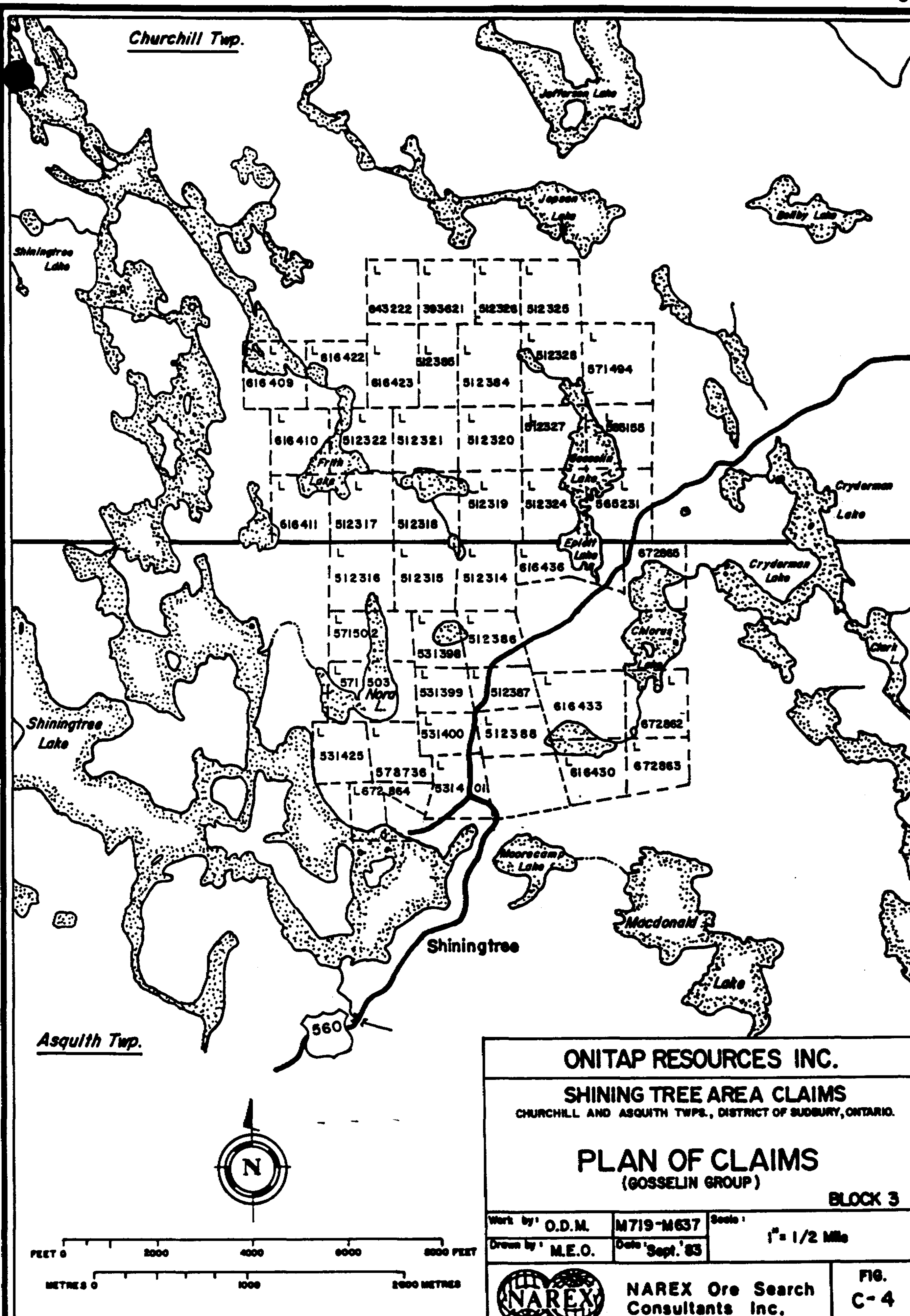
ASQUITH, CHURCHILL, CONNAUGHT TWPS.
DISTRICT OF SUDBURY ONTARIO

LOCATION MAP

Work by: O.M.T.C.	1982/83	Scale: 1:1600 000
Drawn by: R.E.O.	Date: Sept '83	

NAREX Ore Search Consultants Inc.

FIG. C-1



ONITAP RESOURCES INC.

SHINING TREE AREA CLAIMS

CHURCHILL AND ASQUITH TWPS., DISTRICT OF SUDBURY, ONTARIO.

PLAN OF CLAIMS

(GOSSELIN GROUP)

BLOCK 3

Work by: O.D.M.	M719-M637	Scale: 1" = 1/2 Mile
Drawn by: M.E.O.	Date: Sept.'83	

NAREX Ore Search Consultants Inc.

FIG. C-4

C) TOPOGRAPHY AND DRAINAGE

The area in the vicinity of the property is quite typical of the Precambrian Shield, with gently rolling relief. Rock outcrop represents about 5-15% of the surface, the rest is covered with a mantle of muskeg, bouldery clay and sandy clay, till, and dotted with small swampy lakes.

The higher ground of the area is covered with a mature growth mixture of birch, poplar, spruce and balsam and an undergrowth of alder and hazel. The intermediate flat areas consist usually of open spruce and balsam forest. The low-lying or swampy areas consist of an intermixed growth of balsam, cedar, tamarack and alders.

The property is wooded in all areas not occupied by lake or swamp, containing predominantly black spruce, balsam, some white pine and birch trees.

There have been forest fires in the area some years ago as evidenced by the charcoal layer below the organic material near surface in several places.

D) PREVIOUS WORK AND HISTORY

The Gosselin group, Asquith and Churchill Townships

Gold in the Shining Tree area was originally discovered on this block of claims in 1911 by Fred Gosselin. He, along with the Pakowsky interests of Duluth, formed Gosselin Gold Mines Ltd. to develop the "Gosselin Gold Zone". No work was ever filed from this phase of exploration but old Ontario government reports and the present exploration programs have shown that a considerable amount of trenching and stripping was done during the 1912-1918 period.

NAREX

During the same period, a shaft was sunk to a depth of 45 feet on an off-shoot of the Main Vein. It was reported that gold occurred in various places throughout the shaft but that the distribution was erratic. Visible gold can still be found in the muck from the shaft. The "Gosselin Gold Zone" consists of two quartz veins: the Gosselin Vein or Main Vein, which is 1-1/2 miles long, 1.6 to 65 feet wide and strikes N 15 W with a dip of 60 degrees west; and the Discovery Vein which is 2,000 feet long, 3 to 6 feet wide and strikes N 73 W. Mineralization consists of gold, pyrite, chalcopyrite, tetrahedrite and tellurides in scattered pockets. Further trenching and sampling was done by Gosselin Gold Mines Ltd. in 1928 and 1929, by McIntyre Porcupine Mines Ltd, probably in the 1930s, and by Sylvanite Gold Mines Ltd., in 1937. No drilling was ever carried out on the property and development work appears to have ceased in 1937. In 1958, the property was under option

to Bolduc Gold Mines Ltd. The best assay obtained on the Main Vein was reported in 1922 as 4 oz Au/ton and 20.1 oz Ag/ton. Sampling in 1959 by the government resident geologist from Kirkland Lake gave an assay value of 0.21 oz Au/ton over a 7.8-foot width.

It was not until 1973, when Noranda Exploration Company Ltd. obtained an option on ten claims which included the Gosselin Zone, that more detailed exploration on the whole property was undertaken. The work conducted by Noranda consisted of a magnetometer survey, geological mapping with a sampling program, and five short packsack drill holes. The results were inconclusive, although some good assays were obtained (e.g. 0.44 oz Au/ton over 2 feet). Noranda dropped the option in 1974.

.../..

In 1975 Tribridge Consolidated Gold Mines optioned the ten claims and conducted a program of geological mapping, sampling and the drilling of three diamond drill holes. For the first time, an alteration zone was noted but not recognized as being associated with the mineralization. One of the Gosselin Zone assayed 0.052 oz Au/ton over 55 feet. Some of the samples from a trench of an offshoot of the Gosselin Zone assayed up to 0.29 oz Au/ton and 1.32 oz Ag/ton over 2.5 feet. Tribridge allowed the claims to lapse in 1978.

The claims were restaked by R. Annett, T. Saville and J. Sauvé and optioned to Patino Mines (Quebec) Ltd. Patino cut a grid and ran EM-16, magnetometer and geological surveys along with some trenching and drilling. Patino's goal was to discover a large, low-grade, open-pit type gold deposit.

They recognized a quartz-carbonate-fuchsite alteration zone associated with the Gosselin Zone and widespread mineralization throughout the zone. Patino also discovered a new quartz-carbonate-fuchsite zone south of the Gosselin Zone associated with a porphyry where a five-foot section of drill core assayed 0.16 oz Au/ton and 0.51 oz Ag/ton. Some of the sampling returned good assays in other parts of the grid and several untested EM conductors were discovered from their surveys. In September of 1981 Northgate Exploration purchased Patino Mines (Quebec) Ltd. and consequently terminated the option and returned the claims to the optioner, J. Sauvé.

Mr. Sauvé transferred the claims to Timmins Gold Resources Ltd. NAREX Ore Search Consultants Inc. was retained to manage the properties. Subsequently the claims were transferred to 117455 Canada Ltd., a private company which made a joint-venture agreement with Timmins Gold Resources Ltd. The property is now part of the holdings of Onitap Resources Inc. NAREX outlined the south alteration zone and showed it to be very anomalous in gold and thus a good exploration target. A previously unknown iron formation was also tested by drilling and assayed 0.36% Zn, 0.057% Cu, 0.002 oz Au/ton, 0.08 oz Ag/ton over 3.7 feet and lower values over the adjacent 10 feet. Although the values are low, they show the presence of base metals in the iron formation which has been traced geophysically for over a mile. An assay of 0.55 Au/ton over 2.8 feet, resulted from detailed mapping of part of this formation in August of 1982.

As a result of extensive stripping in eight areas of the Gosselin and Gibson claim blocks during June-Dec. 1984 several areas of significant vein type Au mineralization has been outlined.

In area A (claim 512385) the values indicate grades of 0.43 oz Au/t and 2.3 oz Ag/t over a 1 foot width for a length of 100 feet. In area B (claim 393621) a vein gave results of 0.11 oz Au/t, 1.0 oz Ag/t over a 1 ft. width for a length of 30 feet.

In area F, (claim 616422) values of 0.17 oz Au/t over 1 foot width for a length of 30 feet were obtained.

In area H, (claim 616409) an average value of 0.12 oz Au/t over a 1 ft. width for a length of 10 feet was obtained. In addition some free gold was observed nearby but not assayed.

In the Gibson group, (claim 446557) the sampling resulted in an indicated grade of .10 oz Au/t over a 10 foot width in a shear zone with sheared quartz veins. The length of this is probably at least 10-20 feet.

Other low grade (0.04 oz Au/t) sections were outlined in several areas where there might be possibilities for some sort of heap leaching process.

The geochemical survey near stripped areas C, D and E outlined a few weak anomalies which reflect some underlying difference in rock type in the carbonate-fuchsite alteration zone. There may be some preferential enrichment of Au in the silicified and sericitized basalts as opposed to the fuchsite-carbonated ultramafic rocks.

The broad type of anomalies and their trend suggest that the Au source could mainly be stratabound rather than vein type Au mineralization. This is interesting since most of the known Au showings in the Shining Tree area in quartz veins. Clearly in the case of the high Au values it appears that they are associated with the contact of the intrusive quartz-feldspar porphyry and carbonate silicified alteration zones.

E) GENERAL GEOLOGY

The Connaught, Churchill and Asquith Townships area is underlain by a thick pile of Archean metavolcanic rocks. Early Precambrian rocks comprise a suite of subalkalic and alkalic metavolcanics, interlayered mafic and ultramafic intrusive rocks, and clastic and chemical metasediments.

- The subalkalic metavolcanics range in composition from basalt to rhyolite. The alkalic metavolcanics range from hawaiite to trachyte in composition. The uncommon ultramafic and mafic intrusive rocks are interlayered with the mafic metavolcanics. Top determinations on pillowed structures in lavas, and graded bedding in subaqueous tuffs indicate the rocks become younger northeastward. An iron formation occurs in Churchill Township in the Michiwakenda and Okawakenda Lakes area and in the northern half of Connaught Township. The metavolcanic-metasedimentary rocks have been intruded by granitic rocks.

Early to Late Precambrian rocks, represented by numerous diabase dikes, varying in trend from northwest to north to northeast, are cutting both the metavolcanic and metasedimentary rocks and the granitic rocks at Elephant Head Lake.

Midle Precambrian rocks rest unconformably on the older Early Precambrian rocks and comprise rocks belonging to the Espanola Formation of the Quirke Group, the Gowganda Formation of the Cobalt Group, and Nipissing Diabase.

Grey and white limestone, consisting of recrystallized calcite, belonging to the Espanola Formation, occurs in one area only about half a mile north-northwest of Elephant Head Lake in southern Connaught Township.

F) ECONOMIC GEOLOGY

Exploration activity in these three townships was carried out mainly for gold and copper deposits. Gold exploration was concentrated mainly in Churchill and Asquith Townships and copper exploration primarily in Connaught Township.

.../..

Many gold-bearing quartz veins and shear zones are present in the area and some high-grade gold occurrences have been discovered. The gold-bearing quartz veins are usually lensoid and limited in extent, although the Gosselin Vein has been traced for over a mile in strike length and other veins associated with gold-bearing shear zones and carbonate-fuchsite alteration zones are of considerable extent. It has also been suggested (M. W. Carter 1980) that iron formation in the area and gold in this formation are genetically related to the volcanic activity. Copper mineralization has been located at contacts between felsic and intermediate volcanics in northern Connaught Township and in Asquith Township. Copper mineralization is also associated with the Espanola Formation.

G) GEOLOGY OF THE PROPERTY

The property is situated in an area underlain by the Archean Sinclair group which is made up predominately of komatiitic rocks. The lithogic units strike in a NNW direction and outline a sequence of older ultramafic flows on the eastern shore of Gosselin Lake progressing to younger dacite flows to the east near Cryderman Lake. Several exhalite horizons are also intercalated in the volcanic pile with some quartz-feldspar porphyries and carbonate-fuchsite alteration zones present in the region of the ultramafic flows.

The tentative interpretation of the geology is that the rocks can be divided into three suites namely komatiites, tholeiites and calc-alkaline rocks.

.../..

The komatiites (see fig. 3 in pocket at back) are the upper part of the Sinclair group (which is the lowest part of cycle III of the Abitibi stratigraphy) while the overlying tholeiites and calc-alkaline rocks belong to the tholeiitic Shining Tree group (which is the middle part of cycle III in the Abitibi stratigraphy of OGS (1983).

The gold mineralization is located mainly at the base of cycle III just above the cycle II to III transition which is analagous to the Porcupine gold camp where cycle II is the Deloro group and cycle III is the Tisdale group. Almost all of the Au mineralization is hosted in the lower to middle part of the Tisdale group (cycle III). In the Gosselin property area the rocks have been folded into a series of NNW striking anticlines and synclines (see fig.3) with a series of quartz-feldspar porphyries intruded along the anticline axes.

An extensive alteration zone is part of the komatiites suite (I) or marks the transition from suite I to II. This alteration zone which is traceable for approximately 3 kms is made-up of carbonate zones, fuchsite-carbonate zones, silicified zones and sericite + silicified zones. This zone is illustrated as the I to II transition in SW part of fig. 3 and contains many quartz and quartz-carbonate veins with some erratic but high gold values. This diagram also shows the relationship of the QFP bodies to the mineralization and the anticlinal structure of which only one limb is present at surface due to faulting, displacement and presumably erosion of the other limb.

.../..

In the anticline to the east the identical transition with its associated alteration and quartz-feldspar porphyries is exposed along Gosselin lake. This therefore also represents a zone for possible Au mineralization.

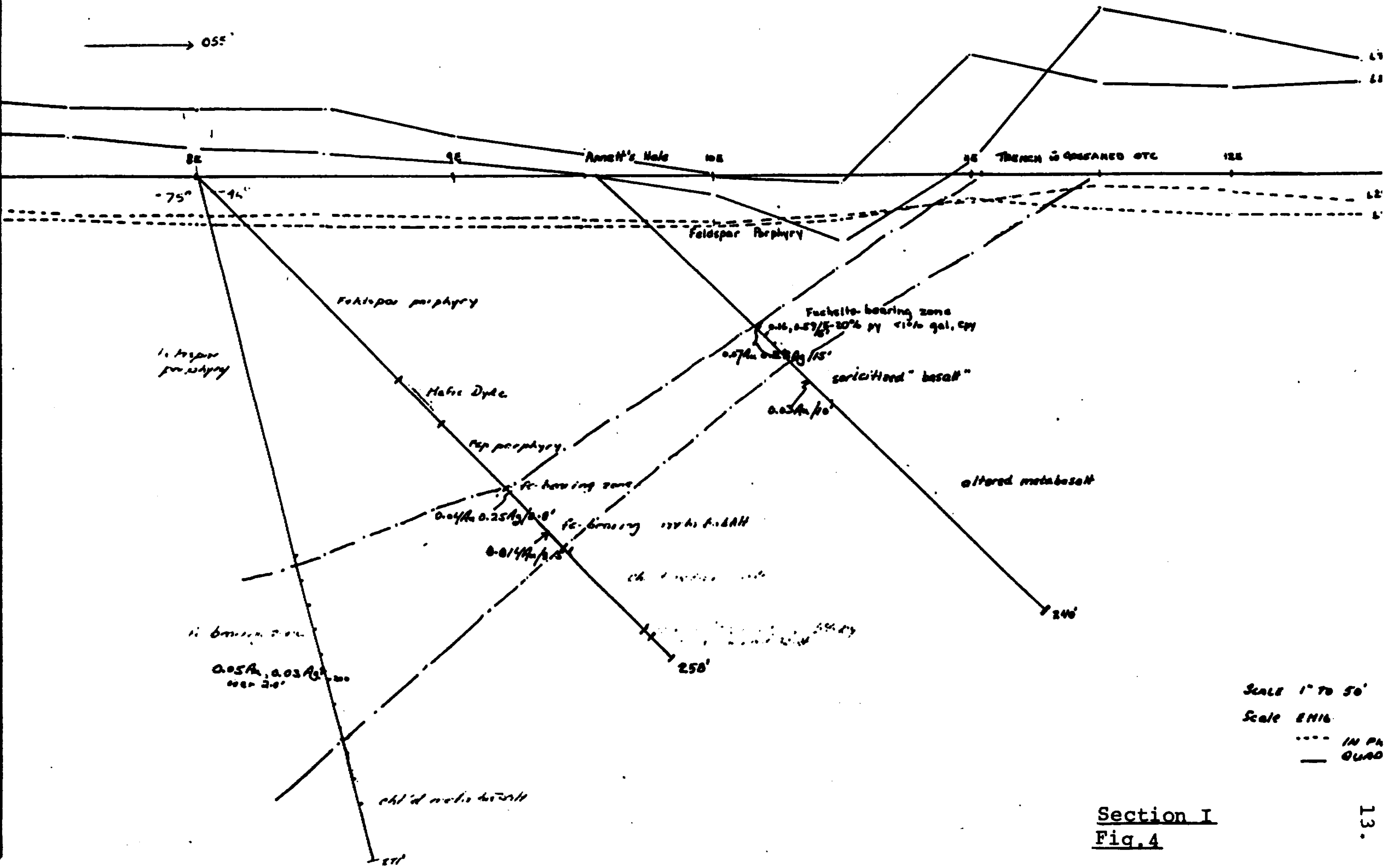
In the intervening synclinal structure the suite II to III transition is exposed in the western syncline without any major alteration zones being observed, although the rocks are strongly carbonatized. At this transition there are however several quartz veins with Au mineralization ie. 1 foot wide X 100 feet long of .43 oz Au/t and 2 oz Ag/t and other lesser quartz veins of .11 oz Au/t, 1.0 oz. Ag/t (1' wide X 30' long). In the eastern syncline the suite I to II transition is exposed with associated carbonate alteration zones, hence representing zones of possible Au mineralization.

The structure of the sequence of rocks is further complicated by several normal faults breaking the area into four different fault blocks (figure 3).

The main area of gold mineralization is at present the western anticline in figure 3. The associated alteration zone contains both erratic high grade quartz-veins and low grade Au mineralization & disseminate pyrite. The quartz feldspar porphyry hosts low grade (0.03 oz Au/t) Au mineralization. Five different sections along this alteration zone have been drilled by a combination of Tribridge, Patino, T.G.R. and Onitap. These sections cover an area near the baseline from 26+00S to 20+00N (4600 feet).

Section	I	-	26 + 00S	-	Patino	(Fig. 4)
"	2	-	14 + 00S	-	T.G.R.	(Fig. 5)
"	3	-	4 + 00N	-	Tribridge	(Fig. 6)
"	4	-	14 + 00N	-	Onitap	(Fig. 9)
"	5	-	20 + 00N	-	Tribridge	(Fig. 7)

.../..

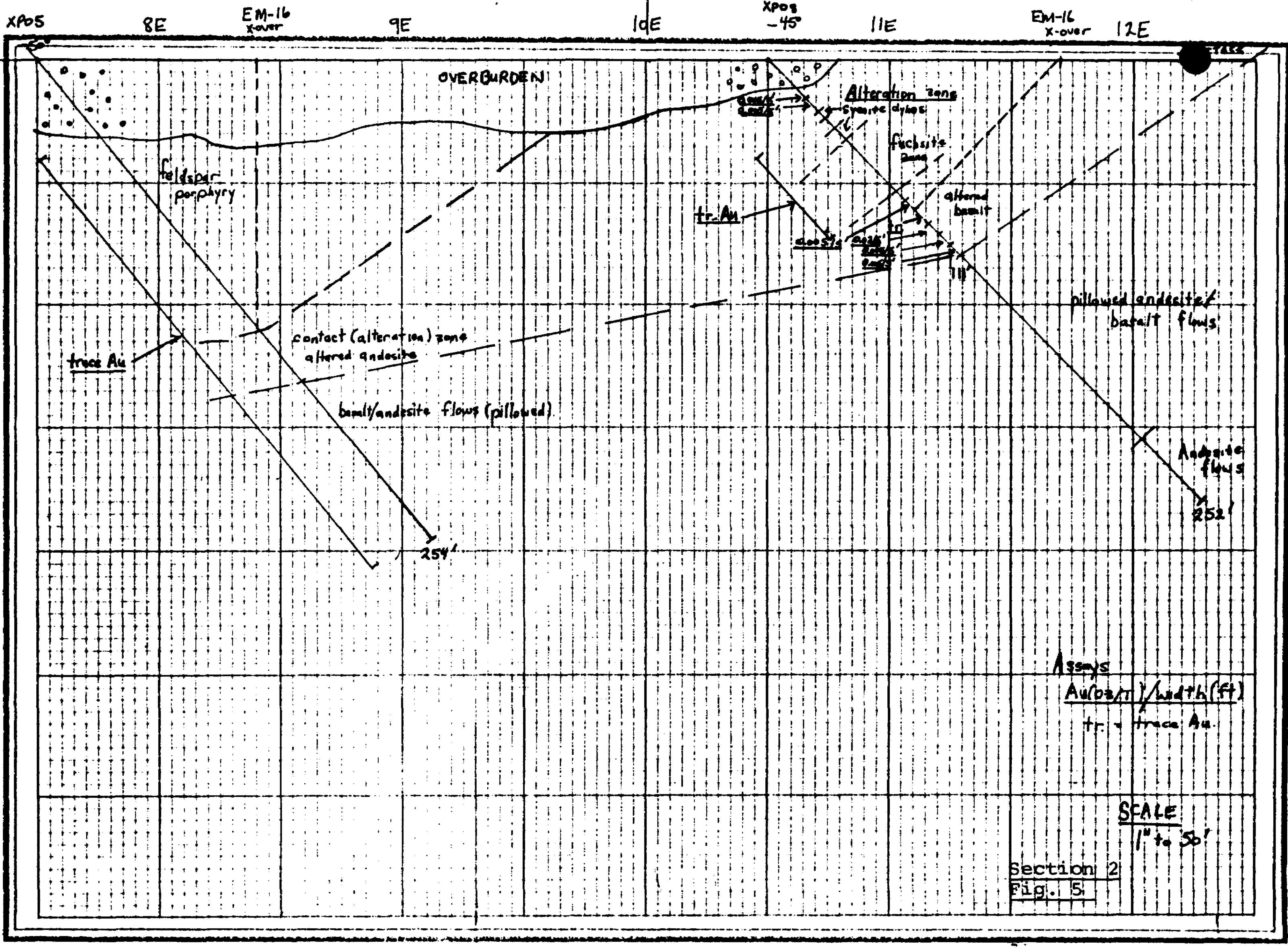


Section I
Fig.4

X-SECTION
DDH XP05, XP08

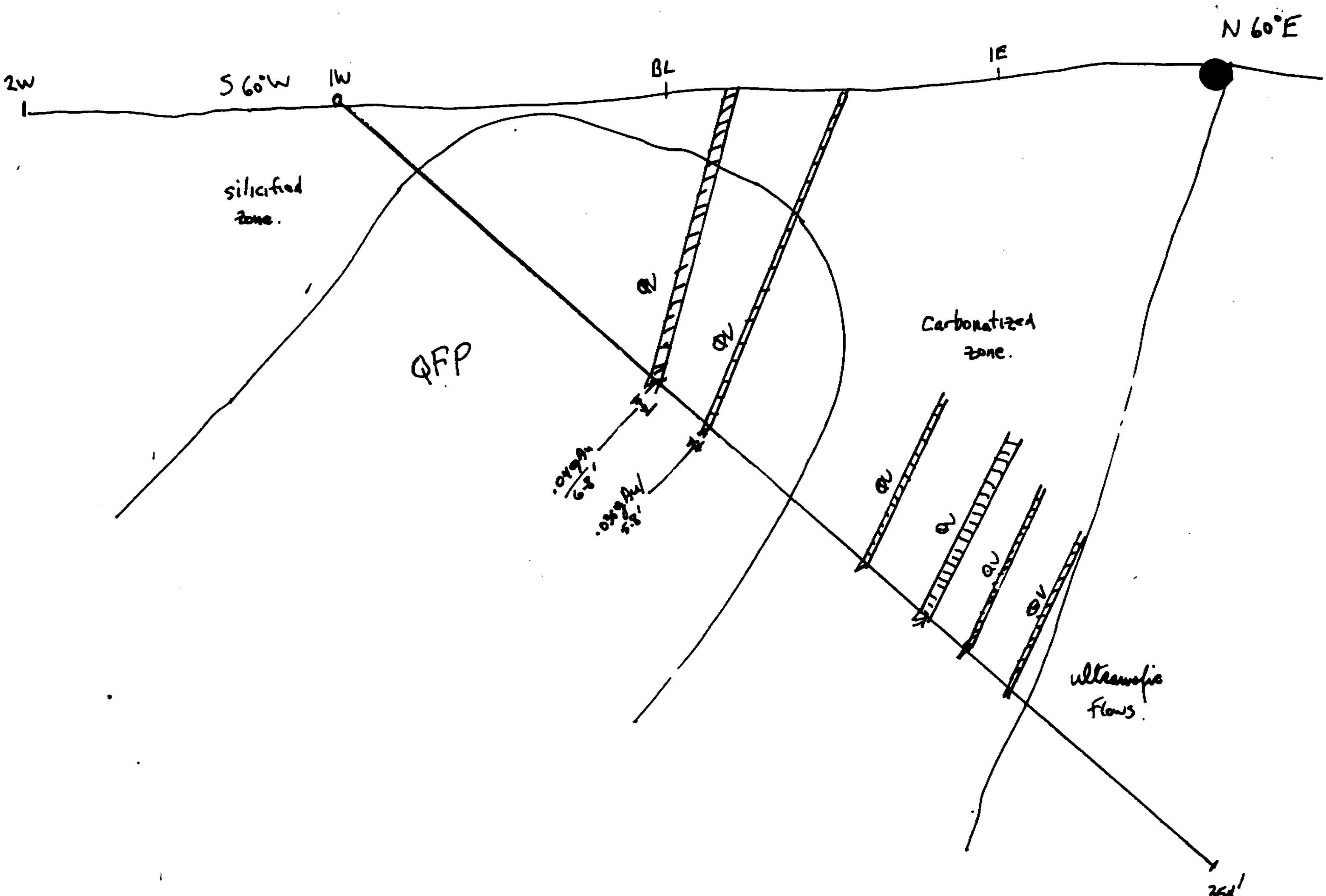
looking North

ANNETT OPTION - ASQUITH
L 14S - azmuth=060°



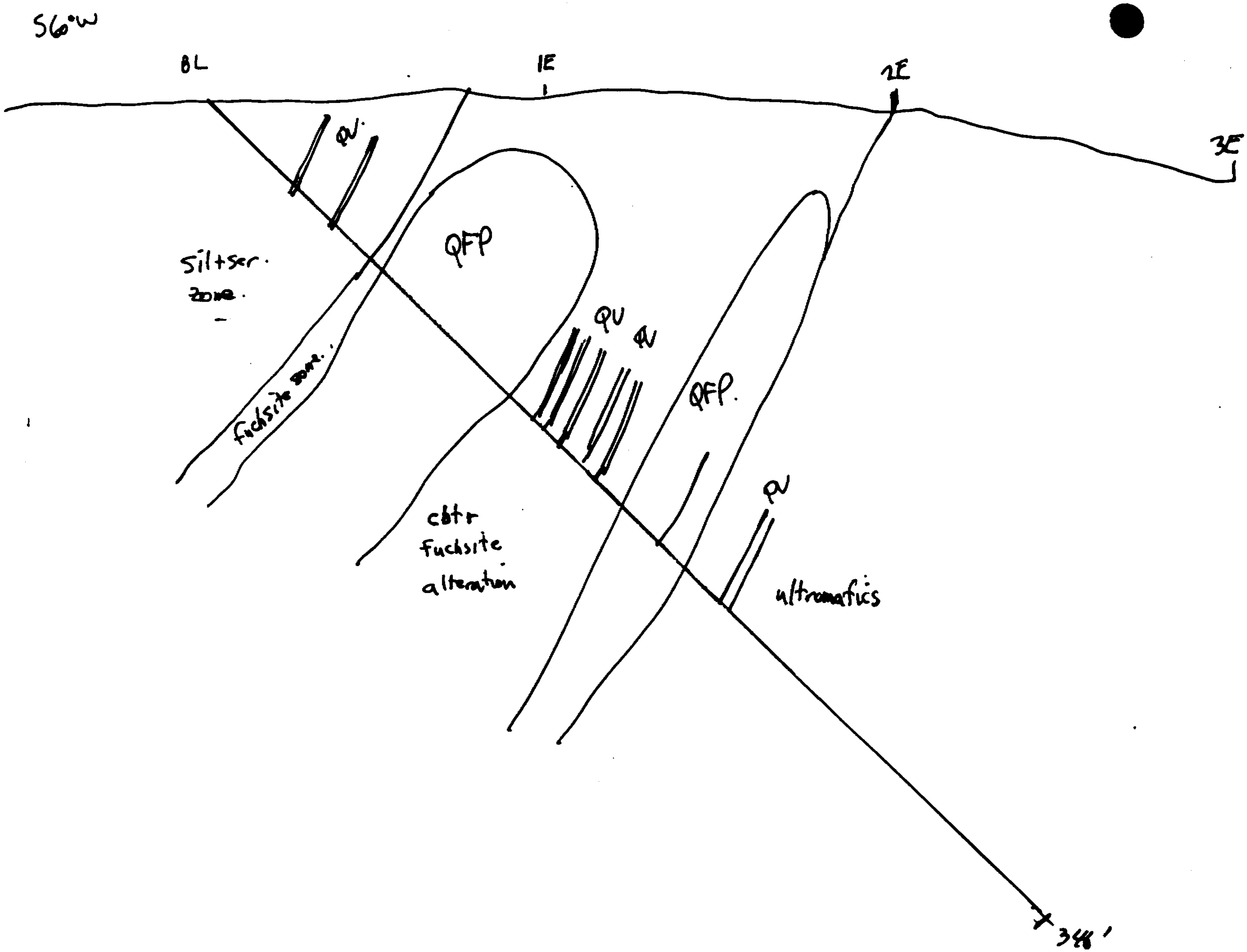
Section 2
Fig. 5

SECTION L4N



Section 3
Fig.6

SECTION L 20+00N



Section 5
Fig.7

The generalized geology has been synthesized from the Tribridge sections and the others are as they were seen by the author. Basically it illustrates the relationship between the ultramafics, alteration zone, QFP, basalts and quartz veins and gives any Au-values encountered.

In section 1 there are Au-values of .07/15', .05/2', .04/.8' and .014/8.5' (all as oz Au/t width in feet). This is hosted in a fuchsite bearing carbonate alteration zone.

Section 2 has .05 oz Au/t over 5 feet in a fuchsite-bearing alteration zone adjacent to the QFP.

Section 3 illustrates the QFP and alteration zone ultra-mafic flows and quartz veins. The Au mineralization found in QV's hosted in the QFP - values of .04/6.8' and .036/5.8' (oz Au/t/over width in feet in ddh T-1 (Tribridge).

Section 4 (subject of present report) - illustrates an alteration zone with disseminated pyrite plus QFP with low grade minerali-zation-average .03 oz Au/t.

Section 5 illustrates the QFP, QV, alteration zones and ultra-mafic rocks but no Au values intersected by Tribridge ddh T-3.

H. DIAMOND DRILL RESULTS

The diamond drilling was done from Jan 20 - Feb. 16, 1985 by Dominik Drilling of Timmins, Ontario and included 3 holes for a total of 988 feet. A brief summary of the drill holes will be given below; the detailed drill logs are found in Appendix A and the assay results in Appendix B. These holes are illustrated in section 14 + 00N - section 4 figure 9.

.../..

<u>DDH 85-1</u> - 45, 200' az : 060°

Location 14 + 00N, 0 + 40W

0	- 4	Casing (no overburden)
4	- 87	Seritized - silicified basalts
87	- 154	Quartz - feldspar porphyry
154	- 168	Silicified basalts
168	- 200	Sericitized - silicifed basalts
	200	END OF HOLE.

<u>Features</u> - disseminated sulphides in sil + ser. zone and QFP section of 0.017 oz Au/t/45 feet from 96 to 131 feet; hosted in an altered pyrite bearing quartz feldspar porphyry QFP.

<u>DDH - 85-2</u> - 065°, 300' az : 090°

Location L 14 + 00N, 0 + 40W

0	- 3	Casing
3	- 72	Silicified - sericitized basalts
72	- 184	Quartz - feldspar porphyry
184	- 212	Silicified - sericitized basalts
212	- 219	QFP
219	- 266	Silicified - sericitized basalts
266	- 300	Ultramafic volcanics
	300	END OF HOLE

<u>Features</u> - from 77' - 104' alterated, chloritized QFP + 1-3% disseminated pyrite in some sections resulted in values of 0.021 oz Au/t over 27' from 77 to 104'. Also lower section below QFP in sil + ser. basalts 1-3% dis. pyrite gave results of 0.032 oz. Au/t over a width of 18 feet from 185 to 203'. In the ultramafics at 273 to 278', 0.04 oz Au/t over a width of 5 feet.

.../..

<u>DDH - 85-8,</u> -60^{o}, 488' az : 060^{o}

Location L14 + 00N, 3 + 50W

0 - 10	Overburden
10 - 40	Basalts - relatively unaltered
40 -140	Silicified - sericitized basalts
140 -326	Quartz - feldspar porphyry
326 -420	Silicified - sericitized basalts
420 -440	Fuchsite alteration zone
440 -460	Basalts - carbonatized
460 -488	Ultramafic flows
488	END OF HOLE

<u>Features</u> - disseminated sulphides in ser. + sil. unit @ 49 - 63' @ 334 - 359' @ 371-412' @ 412-420' and in fuchsite zone @ 420-440'. Best results in intensely veined QFP with QV - 1-5^{o}/pyrite @ 170-186' zone Au values of 0.044 oz Au/t over a width of 16 feet.

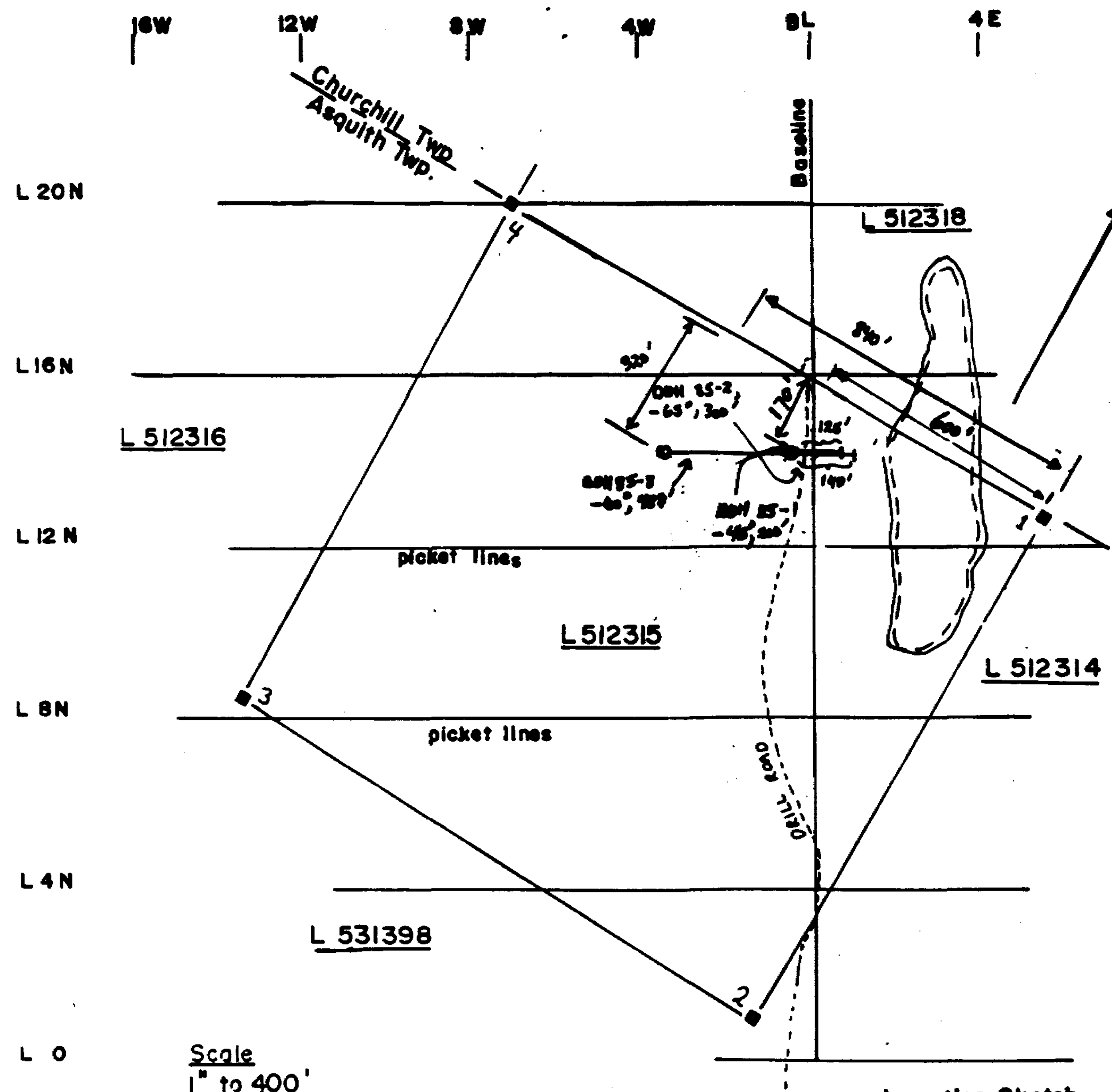
<u>SUMMARY</u>:

The location of the drill holes are given in the following sketch (fig. 8).

Also the geological cross-section (L14 + 00N) is given in Fig. 9 with holes 85-1, 85-2 and 85-8 as well as Tribudge ddh T-2 in section 14 + 00N. The Onitap holes were drilled to confirm results given in ddh T-2 by Tribudge of .02 oz Au/t over 30 feet and .052 oz Au/t over 55 feet. The former was definitely confirmed, while the latter remains a possibility due to the erratic native mineralization in the QFP. Porphyry DDH T-2 is parallel and 10 feet below ddh 85-1.

The results from the drilling are encouraging. In this section (14 + 00N) a zone with an average thickness of 30 feet over a distance of at least 400 feet contains approximately 100,000 tons of 0.03 oz Au/t of possible reserves was outlined. This represents the upper zone of the chloritized quartz-feldspar porphyry with about 1-3% disseminated pyrite.

.../..



Location Sketch
Diamond Drill Holes
85-1, 85-2, 85-8

Asquith Twp. Ont.

Fig. 8

NAREX Ore Search Consultants Inc.

ONITAP RESOURCES INC.

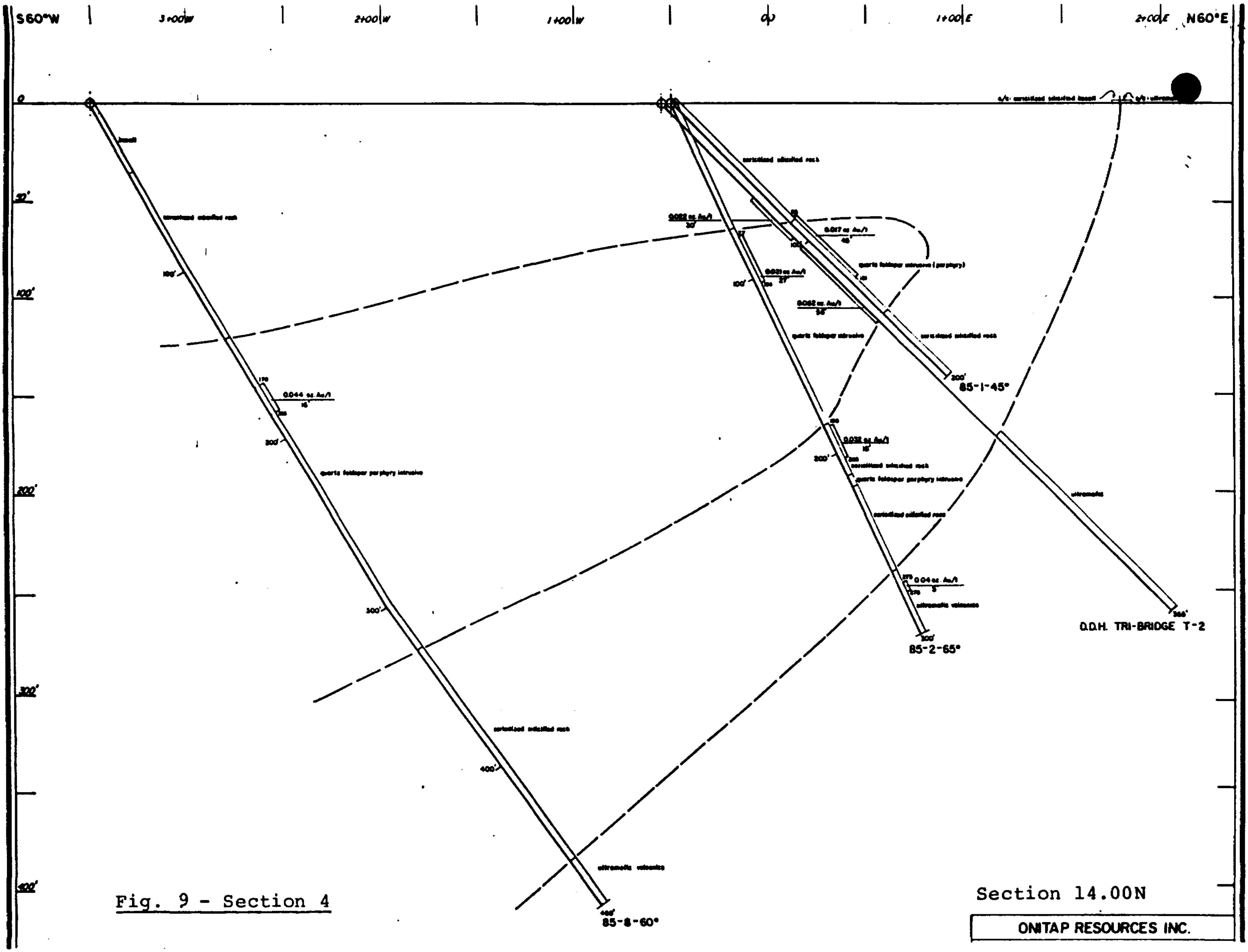


Fig. 9 - Section 4

A lower zone of .032 oz Au/t over a width of 18 feet was intersected in ddh 85-2 but not in 85-1 or 85-8. Thus this is a smaller lower zone with about 18000 tons of .032 Au/t of possible reserves. This zone could of course be of greater signifiquance laterally on other sections both to the north and south of section L14 + 00N.

The width of the upper zone appears to decrease from east to west but the grades becomes correspondingly higher with a value of .044 oz Au/t. over 16 feet in ddh 85-8.

Since the surface of the section east of the collar of 85-1 and 2 was stripped and sampled the extent of the mineralization is limited to the east where the quartz-feldspar porphyry is not exposed at surface. The QFP zone is open however to the west in areas west of ddh 85-8 and as such has good potential for more tonnage and/or higher grade of Au mineralization.

I. CONCLUSIONS AND RECOMMENDATIONS

A diamond drill program consisting of a series of holes 85-1, 85-2 and 85-8 comprising a total of 988 feet was completed in February 1985 by NAREX on the Gosselin claims held by Onitap Resources Inc. near Shining Tree, Ontario. The drilling together with a previously drilled hole T-2 outlined a sequence of silicified and sericitized, pyrite-bearing altered basalts, carbonate-fuchsite alteration zones, ultra-mafic flows and a large quartz-feldspar porphyry sill. The drilling also outlined (1) a zone of low grade Au-mineralization in the altered pyrite-bearing quartz - feldspar porphyry near its upper contact (fig. 8). This zone contains approximately 100,000 tons of 0.03 Au/t of possible reserves.

(2) A lower zone of 18,000 tons of 0.032 oz Au/t was intersected in hole 85-2. This zone is hosted in a pyrite - bearing sericite & silicified alteration zone (altered basalts).

.../..

The generalized geological interpretation (fig.3) also suggests that these are several other main target areas for possible Au mineralization on the Gosselin property, namely the eastern anticline where an identical geological environment exists with the carbonate alteration zones. Another similar situation exists east of the most easterly syncline where well developed carbonate alteration zones are observed, adjacent to a faulted anticlinal structure in which one limb is faulted and displaced.

The alteration zones are interpreted as representing permeable rocks through which large volumes of both syngenetic and epigenetic fluids passed during depositional hiatuses and as such concentrated the Au mineralization. The middle, interviewing syncline has the tholeiite to calc-alkaline suite transition exposed. Several Au-bearing quartz veins (.43 oz Au/t, 2 oz Ag) are associated with this transition although no major alteration zones appear to be associated with the mineralization. This Au-mineralization could represent the suite II to III transition or possible reflects Au-mineralization in the underlying suite I to II contact zone but which has been remobilized in epigenetic quartz veins found at surface.

The area of greatest interest is still however the western anticline with the komatiite to tholeiite transition and the quartz-feldspar porphyry with low grade Au-mineralization in some disseminated pyrite zones. These pyrite zones may represent low grade enveloped for higher grade Au zone. Given the presence of disseminated sulphides, it is recommended that an I.P. (induced polarization) survey be carried out over the length of the alteration zone at a spacing of 200 feet for a total of 20 line miles. Any good targets which resulted from this survey should be drill tested.

.../..

The initial recommended drill program would consist of

(1) to drill section 16 + 00N and 12 + 00W two hundred feet on either side of the low grade section on L14 + 00N. This represents almost 2000 feet of drilling.

(2) To drill the best I.P. target estimated at 5 holes @ 500' each : 2,500 feet.

Therefore the initial program would consist of 4500-5000 feet of diamond drilling.

If results warrant then an expanded drill program of 15,000-20,000 feet could be undertaken to intersect the main alteration zone associated with the western anticlinal structure and outline the extent of the Au mineralization.

At that point, the other possible Au mineralization zones should also undergo same diamond drilling. This would represent a third phase in the drilling program of about 5000 of drilling.

If the results are encouraging then a seperate drill program would have to be set-up to delinate each of the alteration Au-mineralization zones.

PROPOSED BUDGET

Phase I

I.P. survey (20 miles @ $1,000/mile	$20,000.00
diamond drilling & associated costs (assays, core logging, supervision) 5,000 ft @ $25.00	$125,000.00
Contingencies -	$ 21,750.00
TOTAL COST OF PHASE I EXPENDITURES:	$166,750.00

Phase II

Diamond drilling plus ass. costs	
15,000 X $25.00	$375,000.00
Contingencies (15%)	56,250.00
TOTAL PHASE II EXPENDITURES:	$431,250.00

PHASE III

Diamond drilling plus ass. costs	
5,000 feet @ $25.00	$125,000.00
Contingencies	18,750.00
TOTAL PHASE III EXPENDITURES:	$143,750.00

Respectfully submitted,

Peter Born, M.Sc.
Project Geologist

PB/cb

NAREX

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MERQ-OGS

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All Authors- Ontario Ministry of Natural Resources, Division of Mines, Work Assessment Files

All Years - Northern Miner Press

APPENDIX B

ASSAY RESULTS

N.B. : Gosselin property samples denotes by numbers 100 - 256

ASSAYERS (ONTARIO) LIMITED
33 CHAUNCEY AVENUE TORONTO, ONTARIO M8Z 2Z2 · TELEPHONE (416) 239-3527

Certificate of Analysis

Certificate No. NX-30 /#3789 Date: January 31, 1984

Received 11 Samples of Drill core

Submitted by Narex Ore search Consultants Inc. Att'n: Mr. Karl A. Naert
Mr. P. Born

Sample No.	Au ppb	Ag ppm
100	28	<.1
101	153	<.1
102	24	<.1
103	147	<.1
104	59	<.1
105	49	<.1
106	323	<.1
107	301	<.1
108	231	<.1
109	444	<.1
110	219	<.1

ASSAYERS (ONTARIO) LIMITED

Per J. van Engelen
J. van Engelen Mgr.

ASSAYERS (ONTARIO) LIMITED

33 CHAUNCEY AVENUE TORONTO, ONTARIO M8Z 2Z2 · TELEPHONE (416) 239-3527

Certificate of Analysis

Certificate No. NX-31 /#3789 Date: January 31, 1985

Received 47 Samples of Drill core

Submitted by Narex Ore Search Consultants Inc. Att'n: Mr. Karl A. Naert

Sample No.	Au ppb	Ag ppm	Sample No.	Au ppb	Ag ppm
111	146	.1	131	237	.3
112	252	<.1	132	192	.3
113	419	.8	133	262	<.1
114	521	.7	134	119	.8
115	465	.8	135	1120	.5
116	682	.7	136	487	.5
117	802	.7	137	285	.5
118	368	.5	138	177	.6
119	608	.6	139	1640	.9
120	74	.6	140	132	.4
121	80	.2	141	47	.3
122	72	<.1	142	41	.6
123	676	.1	143	76	<.1
124	101	<.1	144	134	.2
125	165	<.1	145	370	<.1
126	333	<.1	146	521	<.1
127	150	.6	147	944	<.1
128	120	<.1	148	296	<.1
129	140	<.1	149	2152	.1
130	250	<.1	150	370	<.1

	Au oz/ton
117	.026
135	.027
139	.047
147	.023
149	.048

ASSAYERS (ONTARIO) LIMITED

Per J. van Engelen B.

J. van Engelen Mgr.

ASSAYERS (ONTARIO) LIMITED
33 CHAUNCEY AVENUE TORONTO, ONTARIO M8Z 2Z2 · TELEPHONE (416) 239-3527

Certificate of Analysis

Certificate No. NX-31 /#3789 Date: January 31, 1985

Received 47 Samples of Drill core

Submitted by Narex Ore Search Consultants Inc. Att'n: Mr. Karl A. Naert

Sample No.	Au ppb	Ag ppm
151	254	.8
152	242	.8
153	285	.6
154	153	.4
155	74	.5
156	95	1.7
157	304	1.3

ASSAYERS (ONTARIO) LIMITED

Per J. van Engelen

J. van Engelen Mgr.

VI.

ASSAYERS (ONTARIO) LIMITED

33 CHAUNCEY AVENUE TORONTO, ONTARIO M8Z 2Z2 · TELEPHONE (416) 239-3527

Certificate of Analysis

Certificate No. NX-32/ #3813 Date: February 15, 1985

Received Feb. 12/85 52 Samples of Drill Core

Submitted by Narex Ore Search Consultants Inc. Att'n: Dr. K. Naert

Sample No.	Au ppb	Sample No.	Au ppb	Sample No.	Au ppb
158	1240 *	178	170	1011	<5
159	221	179	75	1012	21
160	105	180	63	1013	33
161	51	181	21	1014	67
162	54	182	206	1015	<5
163	46	183	374	1016	16
164	130	184	46	1017	12
165	145	185	429	1018	<5
166	<5	186	33	1019	33
167	86	187	28	1020	39
168	57	1001	14	1021	23
169	12	1002	19	1022	9
170	560	1003	<5		
171	105	1004	19		
172	57	1005	28		
173	81	1006	26		
174	12	1007	33		
175	340	1008	21		
176	61	1009	28		
177	700	1010	16		

*158 - .039 oz/ton

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Per ____

J. van Engelen Mgr.

ASSAYERS (ONTARIO) LIMITED
33 CHAUNCEY AVENUE TORONTO, ONTARIO M8Z 2Z2 · TELEPHONE (416) 239-3527

Certificate of Analysis

Certificate No. NX-33/ #3821 Date: February 21, 1985

Received Feb. 18/85 54 Samples of Drill Core

Submitted by Narex Ore Search Consultants Inc. Att'n: Dr. K. Naert

Sample No.	Au ppb	Sample No.	Au ppb	Sample No.	Au ppb
188	65	208	52	228	30
189	10	209	36	229	10
190	30	210	3000*	230	7
191	17	211	1292**	232	14
192	119	212	486	233	<5
193	156	213	48	234	13
194	55	214	134	235	7
195	44	215	112	236	<5
196	563	216	168	237	<5
197	47	217	11	238	<5
198	75	218	<5	239	<5
199	56	219	<5	240	14
200	40	220	<5	241	<5
201	108	221	22	242	14
202	24	222	<5		
203	20	223	32		
204	18	224	57		
205	79	225	11		
206	338	226	7		
207	15	227	<5		

*210 .088 oz/ton Au
**211 .039 oz/ton Au

ASSAYERS (ONTARIO) LIMITED

Per ________________

J. van Engelen Mgr.

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Certificate of Analysis

Certificate No. NX-34/ #3833 Date: February 27, 1985

Received Feb 26/85 14 Samples of Drill Core

Submitted by Narex Ore Search Consultants Inc. Att'n: Mr. Peter Born

21-01-109

Sample No.	Au ppb
243	<5
244	7
245	<5
246	47
247	7
248	49
249	433
250	11
251	7
252	<5
253	15
254	<5
255	805
256	769

ASSAYERS (ONTARIO) LIMITED

Per ______________________

J. van Engelen Mgr.

Title: The Use of the Induced Polarization Method To Locate Gold-Bearing Sulphide Mineralization

Author: Philip G. Hallof*, Ph.D., P.Eng.

and

Mitsuru Yamashita*, M.Sc., P.Eng.

Abstract:

Many, perhaps even most, of the gold deposits discovered in Canada in recent years are associated with metallic sulphide mineralization. This is certainly true of the new ore zones located in the Hemlo Area of Ontario and the Val D'Or Area of Quebec. The metallic mineral zone itself, will almost always have a true IP effect. Upon rare occassions, it is possible that no IP effect will be detectable, if intense, late silicification has taken place. The detectability of a zone that is anomalous, by surface induced polarization and resistivity measurements is determined by the following factors:

i) The width and lateral extent of the Zone.

ii) The thickness and resistivity of the covering layer.

iii) The resistivity of the surrounding rocks.

iv) The background IP effect in the surrounding rocks.

v) The electrode configuration and the electrode interval employed for the survey.

INTRODUCTION

Many, perhaps even most, of the gold deposits discovered in Canada in recent years are associated with metallic sulphide mineralization. This is certainly true of the new orebodies located in the Hemlo Area of Ontario. It is also true for many of the more traditional types of gold deposits such as those in quartz veins or those contained within swarms of quartz veinlets.

* Phoenix Geophysics Limited

S.V. 15-10-84

TRUE IP EFFECT WITHIN ZONE

In recent years we have made considerable progress in our understanding of the induced polarization phenomena (Pelton, et al 1978; Hallof and Klein, 1982; Hallof, 1983). We can now make rough predictions as to the magnitude of the IP effect, and more importantly the shape of the phase vs frequency curve, for a well documented zone of metallic mineralization. We know that the concentrations of metallic minerals present, and also the texture of the mineralization, determine the induced polarization response.

The induced polarization and resistivity response from within a potentially gold-bearing zone of mineralization will be little affected by the presence, or absence, of gold. As mentioned previously, there is a true IP effect within almost all gold-bearing sulphide zones; the difficulty encountered in the detection of some zones of ore-grade mineralization, in some geologic environments, is a direct result of the high value mankind has placed upon the noble metal.

I can think of no other exploration problem in which a steeply dipping mineralized zone with a width of two to three meters, a sulphide content of two to four percent pyrite, under twenty meters of glacial till, would be considered an important target. Yet, in the Hemlo Area of Ontario some of the newly discovered ore zones have exactly this description; they also contain 0.25 to 0.35 oz. of gold per ton. Much of the ore at Hemlo is present in greater widths, and contains greater concentrations of pyrite. However, it is also true that in places the favourable quartz-sericite schist host rock is a poorer geophysical target than this, particularly if little or no gold is present.

The fact that makes geophysical exploration for gold such a tricky enterprise is the high value of gold itself. A zone ten meters in width and containing ten percent pyrite may contain no gold, or one-half ounce of gold per ton; in neither case will the gold be visible. Such a zone could be one to two meters in width and still be of immense geologic and economic interest.

Such a small, weakly mineralized zone is rarely of interest in exploration for a massive, volcanogenic sulphide deposit. Some "porphyry copper" deposits may contain only a few percent sulphide phase-IP measurements with the frequency in the vicinity of 1.0 Hz would be optimum.

The data shown on Figure 3 and Figure 4 demonstrate the use of computer generated, forward problem solutions to obtain an estimate of the electrical parameters of the source of an IP anomaly. The field data (Figure 3) was measured using X = 50 meters over the up-dip edge of the mineralized zone at the Golden Sceptre property at Hemlo, Ontario. At surface on Line 16W, the favourable schist is weakly pyritized and only low gold values are present. However, an ore-grade zone of gold-bearing sulphide mineralization begins at a depth of a few tens to a hundred meters. The IP anomaly measured using X = 50 meters is low in magnitude.

The weakly mineralized rock unit is about ten meters thick at Line 16W. Therefore, it is possible to use a forward problem solution to obtain an estimate of the electrical parameters of the source. (Figure 4). The electrical parameters necessary in a source with a width of ten meters are much the same as those measured using X = 1.0 meters over the outcrop of the Corona Orebody.

The computer generated, forward problem solution shown on Figure 4 is typical of those that will be employed in interpretational solutions and problems throughout this paper. The finite element matrix solution is for a two-dimensional geometry, with the survey line perpendicular to the strike of the earth geometry. Although we shall present only dipole-dipole electrode configuration data in this paper, the results for any electrode configuration may be calculated. Because a finite element matrix solution is employed, the subsurface modelled may have any number of rock types (electrical parameter variations) with any shape.

A recent improvement in the software permits a random error to be added to the parameter values for each finite element. For the solution on Figure 4, the maximum random error was ± 20%; however, any error magnitude may be used. The use of this software formulation results in pseudo-sections which are somewhat irregular; therefore, they are more easily identified with actual field data.

the situation above, the anomaly from a source 10 meters in width and containing 5% to 6% sulphide mineralization will look very much like the anomaly from a rock unit that is 60 meters in width and containing a much lower concentration of metallic minerals.

The usual result of the factors outlined above is that if a reconnaissance IP and resistivity survey is planned using very large electrode intervals, two things will happen! There will be some small sources that will not be detected by the survey, even if they are at zero depth. Secondly, there will be a great many one-station and two-station anomalies that could be due to a narrow, shallow, weak source of the type being sought. Detailed measurements with shorter electrode intervals will, of course, help to sort out the problem.

However, the detailed measurements will require survey time and therefore add to the cost of the survey. Some of the cost benefit arising from the use of the large electrode interval will be lost in the requirement for a greater amount of detailed survey time needed to completely evaluate, and better locate, the sources of all of the reconnaissance anomalies.

The cost of not detecting a few very small, very weak sources can, of course, not be evaluated since they may never be tested. This latter concern can be very real, once the geophysicist and the geologist realize that the weak, narrow anomaly shown on Figure 3 and Figure 4 is all that we can expect to detect from a narrow band of mineralized quartz-sericite schist that contains the up-dip end of a previously unknown zone of gold-bearing sulphide mineralization at a depth of less than 100 meters. As we shall see, if X = 100 meters, or even X = 75 meters, were used for the reconnaissance survey, the resulting apparent anomaly might not be interpretable.

Even if the conditions are fairly ideal for the application of the IP method, a reconnaissance survey using large electrode intervals may not definitely detect the source that is the target of the survey. The theoretical results shown on Figure 5 are those that would be measured, from a fairly typical source, using X = 75 meters.

detail at the time of the first interpretation; it was chosen for detail during a review of the reconnaissance data several months later.

THICKNESS AND CONDUCTIVITY OF COVERING LAYER

Even for detailed measurements with a small electrode interval, the geologic environment, and the electrical parameters of that environment have a profound effect upon the IP anomaly to be detected from a small zone of weak mineralization. We will first examine the influence of the thickness, and the conductivity of the material that lies between the top of the anomalous zone and the surface on which the measurements are made.

In these forward problem solutions we have used X = 25 meters and used a width of the source of W = 7.5 meters. The electrical parameters of the source, and the country rock have been chosen to approximate those in the Hemlo Area. In order to approximate the "real earth" situation, we have introduced a maximum random error of ± 35%.

The data on Figure 9 is that for the case in which the source is at a depth of 19 meters. The overlying layer has a lower resistivity, similar to that for glacial overburden. Even with the introduction of the random errors, the anomalous pattern has a recognizable shape. The maximum apparent phase shift is less than twice background. However, it is important to notice that the anomalous magnitude is 4.0 to 6.0 milliradians above background. This can be achieved.

If we increase the thickness of the overburden to 25 meters (Figure 10), we have altered the non-polarizable conduction path that lies in parallel with the conducting paths that are influenced by the polarizable source. We have also reduced the resistivity of the overburden layer from 300 ohm-meters to 150 ohm-meters. This value is still fairly typical for Canadian Shield glacial overburden. Without delving into the usefulness, or even the validity, of the M.F. (Metal Factor) or M.C.F. (Metallic Conduction Factor) parameter, it should be noted that its magnitude does not change very much. As seen on Figure 10, the $(M.F.)_a$ pseudo-section is much the same. However, since the apparent resistivities must be lower, the anomalous apparent phase shifts measured are also lower in magnitude.

The results (X = 25 meters) shown on Figure 11 show a weak, narrow, shallow anomaly that might just be interpretable due to the fact that the anomalous pattern is regular, and easily recognized. However, any interpretation of a narrow, shallow, weak anomaly becomes even more difficult as the background values are made more complex and a greater variability is added (Figure 12). The apparent parameters shown in Figure 12 are variable and complex enough, that the presence of an anomaly may be impossible to interpret.

It is clear from this simple example, that the search for small, weakly mineralized zones, that might contain gold, would be more difficult in a different geologic environment.

ELECTRODE INTERVAL (X) AND MULTIPLE SOURCES

In a reconnaissance induced polarization and resistivity survey with large electrode intervals, a very large volume of rock is averaged into each measurement. Since the potentials must satisfy LaPlace's equation, the apparent effects measured must be very smooth. For X = 75 meters, n = 1, the outside electrodes are 225 meters apart. It is not surprising that very little detail concerning the internal character of a bedrock source can be interpreted from a reconnaissance anomaly.

The results shown on Figure 13 are those measured with X = 75 meters over two sources that have a width of 10 meters and a separation of 45 meters. The pseudo-section indicates only a single, simple anomalous pattern, centered at station 0+00. The results are almost exactly like those shown on Figure 4 or Figure 9, from a single source.

There are several comments that should be made concerning the difficulties that might be encountered in determining the nature of the source of the anomaly outlined on Figure 13.

1) A vertical drill hole spotted near the center of the anomalous pattern (i.e., near station 0+00) would not intersect either source.

anomalies are due to pyritic mineralization within the favourable metamorphic rocks. The three sources located by the reconnaissance data (Figure 15) do not contain significant gold values. The narrow source centered at 0+35S to 0+25S, detected only by the detailed, X = 10 meter measurements, does in fact contain some gold values.

CONCLUSIONS

With very few exceptions, the zones of weak to moderate concentrations of sulphide mineralization that sometimes contain gold, can be expected to have a significant true induced polarization effect. The amount of gold present does not appear to be related to the sulphide concentration in the zone. Therefore, a zone can be a few meters in width, contain a few percent sulphide mineralization and be an extremely rich orebody because it also contains a third of an ounce of gold per ton. Much of the ore in the orebodies recently discovered in the Hemlo Area of Ontario has this general description.

In order to specify an induced polarization and resistivity survey to detect this type of mineralized zone, it is necessary to choose the parameters of the survey so that the apparent effects measured at the surface will be interpreted as being anomalous. It is not satisfactory to merely choose a large electrode interval so that the progress of the survey will be rapid and the cost of the survey will be reduced.

A number of factors must be considered in planning a survey for typical gold-bearing sulphide zones. These factors include:

- i) The true IP effect and resistivity within the sources that are the the target of the exploration program
- ii) The electrode configuration to be used for the IP Survey
- iii) The electrode interval to be used relative to the expected source width
- iv) Thickness and Conductivity of the Surface Layer
- v) Background IP Effects and their Variability
- vi) The necessity to detect multiple sources

From a practical point of view, it is usually necessary to execute a reconnaissance survey using as large an electrode interval as is practical. Then, it is necessary to check a large number of weak, The metallic sulphide mineral is often pyrite or frequently arsenopyrite. However, sometimes chalcopyrite and/or other base metal sulphide minerals are also present. It is the presence of the sulfide minerals that usually result in a true IP effect within the gold ore zone. If free gold is present, it is of course metallic and contributes to the IP effect. However, even in the richest ore zone the gold concentrations are too small to make a significant contribution to the IP effect.

Once in a great while, we have encountered a gold-bearing sulphide zone (usually a quartz vein) in which a late surge of intense silicification has completely eliminated all porosity within the mineralized zone. In this situation the mineralized zone will have an extremely high true resistivity and there will be no true IP effect within the zone. There can be no IP effect, if there are no ionic-metallic interfaces.

However, these situations are rare and it can usually be assumed that a sulphide zone (with or without gold) will have a true IP effect. If the parameters of an induced polarization and resistivity survey are properly determined, such a mineralized zone of significant width and relatively shallow depth can usually, but not always, be detected by surface IP methods.

In this paper we shall try to make clear the considerations that determine the type of IP and resistivity anomaly to be expected from a narrow, weakly anomalous, mineralized zone. It is also very necessary to understand the differences between a reconnaissance survey and a detailed survey. We shall use actual field data, primarily from the Hemlo Area, to demonstrate actual IP anomalies from known mineralized zones, with gold present. We will then employ computer generated, forward problem solutions to demonstrate the variations in the apparent IP anomalies that can be expected with different geologic conditions. It is hoped that from this presentation the field geophysicist will be able to isolate the problems to be expected in using the induced polarization and resistivity techniques, in any given gold exploration problem.

mineralization; however, in order to be of possible geologic or economic interest they must have a considerable lateral extent. It is only in exploration for gold-bearing sulphide orebodies, that very small zones of very weak metallic mineralization can be ore!

Due to the relatively small size of these sources, it is not often possible to measure the true electrical parameters of the source, even with very short electrode intervals. It is usually necessary to measure the apparent anomaly from a known source and then to determine the true effects necessary in a narrow source to create an anomaly of the measured magnitude. Regardless of how it is accomplished, it is always desirable to gather as much information as possible concerning the true IP effect, and other parameters, for the type of target being sought.

The results shown on Figure 1 are the spectral IP data, in pseudo-section format, measured with one meter electrode intervals over the up-dip end of the Corona Orebody at Hemlo, Ontario.

The highest apparent resistivities measured were from the quartzites in the hanging wall and the footwall. The apparent resistivities within the schist host rock are somewhat lower in magnitude, and quite variable.

The apparent IP effects from the pyrite mineralization in the schist are 50 to 80 milliradians; these are fairly typical for the ore mineralization in the Hemlo Area. The anomalous pattern is broad, and nearly uniform; under these conditions the apparent effects measured must be nearly equal to the true effects within the source.

It is of some interest that the time-constant (τ_1) appears to be larger at the eastern edge of the schist rock unit. This is the position of gold values within the pyritic schist. The indication of larger grain-size (larger τ_1) (see Hallof, 1983) for the pyrite with gold present, agrees with petrographic work carried out by the Ontario Geologic Survey. (Springer, J; 1983).

The spectral plot shown on Figure 2 is typical of those from within the anomaly. (see Hallof, 1983). They suggest a relatively small grain-size (τ_1). The spectral plot indicates that exploration using

ELECTRODE INTERVAL (X) vs. SOURCE WIDTH (W)

In all of our exploration work to locate gold-bearing sulphide zones, we have used the dipole-dipole electrode configuration. The electrode interval (X) has varied from X = 100 meters to X = 3.0 meters; the electrode separation (n) has varied from n = 1,2 to n = 1,2,3,4,5,6. We employ the dipole-dipole electrode configuration, because of the second lateral derivative nature of the measurement. The apparent effects measured from a small, local source are larger in magnitude than for other electrode configurations.

For any given survey, planned for any purpose, the choice of the electrode interval (X) is one of the most critical that the geophysicist must make. A larger value of (X) will result in a faster rate of progress (and therefore a lower cost) for the work planned. All things being equal, a larger value of (X) should also result in a greater depth of detection for the survey.

However, in an exploration program to locate the narrow, weak sources described above, there are additional factors that must be taken in account:

a) First and foremost is the fact that measurements with large electrode intervals average a large volume of the subsurface into each measurement. If the anomalous source is small, it will have a small effect on the apparent value measured. It is entirely possible that if the electrode interval is too large, no detectable anomaly will be measured from a small source, regardless of its depth.

b) The exact location of a small source between two widely spaced electrodes cannot be determined. If X = 100 meters is used to locate a source with a width equal to 10 meters, the minimum uncertainty in locating the source is 100 meters; the maximum uncertainty may be 200 meters.

c) In any situation in which the electrode interval is appreciably greater than the width of the source, there is a general ambiguity regarding the parameters of the source. For

In these cases, as in all further cases, the source parameters are set at fairly typical values for the zones at Hemlo, Ontario or for sulphide bearing quartz veins. These parameters of the source are then held constant while the parameters of the survey, or the parameters of the other rocks present, are varied. It is obviously possible in each case to make the reconnaissance anomaly more definite by altering the parameters of the source. However, that is not the point we are trying to make. What we are attempting to demonstrate is how easy it can be to miss a possibly important bedrock source, by a careless choice of survey parameters.

A further, unwelcome conclusion will be that for any given earth geometry there may very well be narrow, weakly mineralized sources at depth that cannot be detected by IP measurements, no matter how carefully the parameters of the survey are chosen.

The maximum random error for the example shown on Figure 5 has been set at ± 35%. For X = 75 meters the anomalous magnitudes are less than twice background. This poorly interpretable anomaly does point out one distinct advantage of the pseudo-section format for plotting dipole-dipole measurements made with multiple (n) values. A low magnitude, anomalous measurement that conforms to a recognizable anomalous pattern, can often be considered to be significant, even if it is not several times background in magnitude.

The results measured for X = 25 meters are shown on Figure 6. In this situation, the anomalous magnitude, as well as the anomalous pattern, can be considered to be anomalous. It should be further noted that the uncertainty of location of the source has been reduced from about 100 to 150 meters to the much smaller distance of 25 meters.

These problems of interpretation are encountered continuously in the field. The results shown on Figure 7 (reconnaissance, X = 50 meters) and on Figure 8 (detail, X = 25 meters) located a pyrite-bearing schist band in the Hemlo Area of Ontario. The zone was five meters in width; it contained a few percent pyrite and a few low gold values. The zone is not ore, but it is of extreme geologic importance. However, the reconnaissance anomaly is not significant enough to have been chosen for

The apparent phase-shift and apparent M.F. anomalous patterns are still fairly definite. However, there is one difference from Figure 9. In order to clearly outline the anomaly, the accuracy in the measurements of the apparent phase-shift must now be 1.0 to 3.0 milliradians. This is considerably more difficult to achieve consistently.

It is this need for extreme accuracy, and sensitivity, that has led us to use the phase IP technique for reconnaissance and detailed surveys in regions such as the Hemlo Area. A system such as the Phoenix IPV-2 Phase IP Prospecting system can use coherent filtering (signal stacking) and extremely accurate crystal clocks to achieve an accuracy of 2.0 to 3.0 milliradians of phase shift, at 1.0 Hz. This is just about an order of magnitude better than previous variable frequency or time-domain IP systems.

The same result can be expected in exploration for Hemlo-type, gold-bearing sulphide zones in geologic regions of thicker, more conductive overburden. The problems of exploration and the need for greater accuracy would be even greater in a geologic environment of deep weathering, which would form a very conductive overburden layer. In this regard, the Hemlo Area of Ontario is just about ideal for the use of IP. There is a thin layer of glacial overburden almost everywhere; this cover confounds the geologist and makes the preparation of electrodes relatively easy. At the same time, the overburden layer is usually thin enough, and has a high enough resistivity, so that the measurement difficulties are not great.

BACKGROUND IP EFFECTS

Another advantage we have found to exploration in the Hemlo Area is that the relatively non-porous, high resistivity, metamorphic rocks that form the host rocks are usually devoid of metallic mineralization. Therefore, the background IP effects measured in reconnaissance surveys are usually low in magnitude and a weak, low magnitude IP anomaly can be interpreted in the data, if it is present.

2) An angled drill hole spotted to either side of the anomaly, would intersect one of the sources but would probably be stopped before it intersected the second source.

3) A trench to bedrock (a depth of 5.0 meters) that was 50 to 60 meters in length, and centered near station 0+00, might expose one source or the other, or just possibly both.

If X = 15 meters are used for the survey (Figure 14) the sources still appear to be shallow (i.e. anomalous for n = 1), since the depth of cover is only 6.0 meters. This electrode interval is appreciably less than the separation of the sources. In these results, the presence of two distinct sources can clearly be interpreted from the pseudo-section.

The problem of missing multiple sources is a continuing problem in interpreting reconnaissance IP data. It is a particular problem in exploration for gold-bearing sulphide zones. Several narrow zones of weak pyritic mineralization may be present; however, while the mineralized zones may all look the same, one may contain significant gold values. If the anomalous zones have been located in a region of geologic interest, there is no way to determine which of the sources may be of the greatest economic importance; they must all be tested. In order to accomplish the testing in an effective manner, it is almost always necessary to make detailed measurements.

The X = 50 meter reconnaissance induced polarization and resistivity data shown on Figure 15 is also from the Hemlo Area. On this pseudo-section, it is possible to interpret three weak, narrow, shallow IP anomalies. The anomaly centered at 1+00S to 0+50S was somewhat more definite and it was detailed first.

The results shown on Figure 16 were measured using X = 10 meters. The anomaly centered at 0+95S is the source of the interpreted reconnaissance anomaly. This source is indicated to have some width. The shallow source centered at 0+35S to 0+25S cannot be interpreted from the reconnaissance results; it is indicated to be quite narrow.

All of the anomalous sources located by the IP results shown on Figure 15 and Figure 16 have been investigated by trenching. All four narrow, shallow reconnaissance anomalies using detailed measurements with shorter electrode intervals. These detailed measurements will confirm the presence of a definite, narrow source, more definitely locate the position of the source and more fully evaluate the nature of the mineralization that is the source of the anomaly.

None of the above will enable the geologist and geophysicist to predict whether significant gold values are present. However, the detail measurements will ensure that only a short drill hole is necessary to confirm that no gold is present.

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It is obvious that this paper could not have been prepared for presentation without the help and permission of the following companies. We owe them our thanks.

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Teck Corporation

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SPECTRAL IP RESULTS HEMLO AREA , ONTARIO

ANOMALY OVER CORONA ORE ZONE AT ZERO DEPTH

LINE – O DIPOLE – DIPOLE ELECTRODE CONFIGURATION X = ONE METER

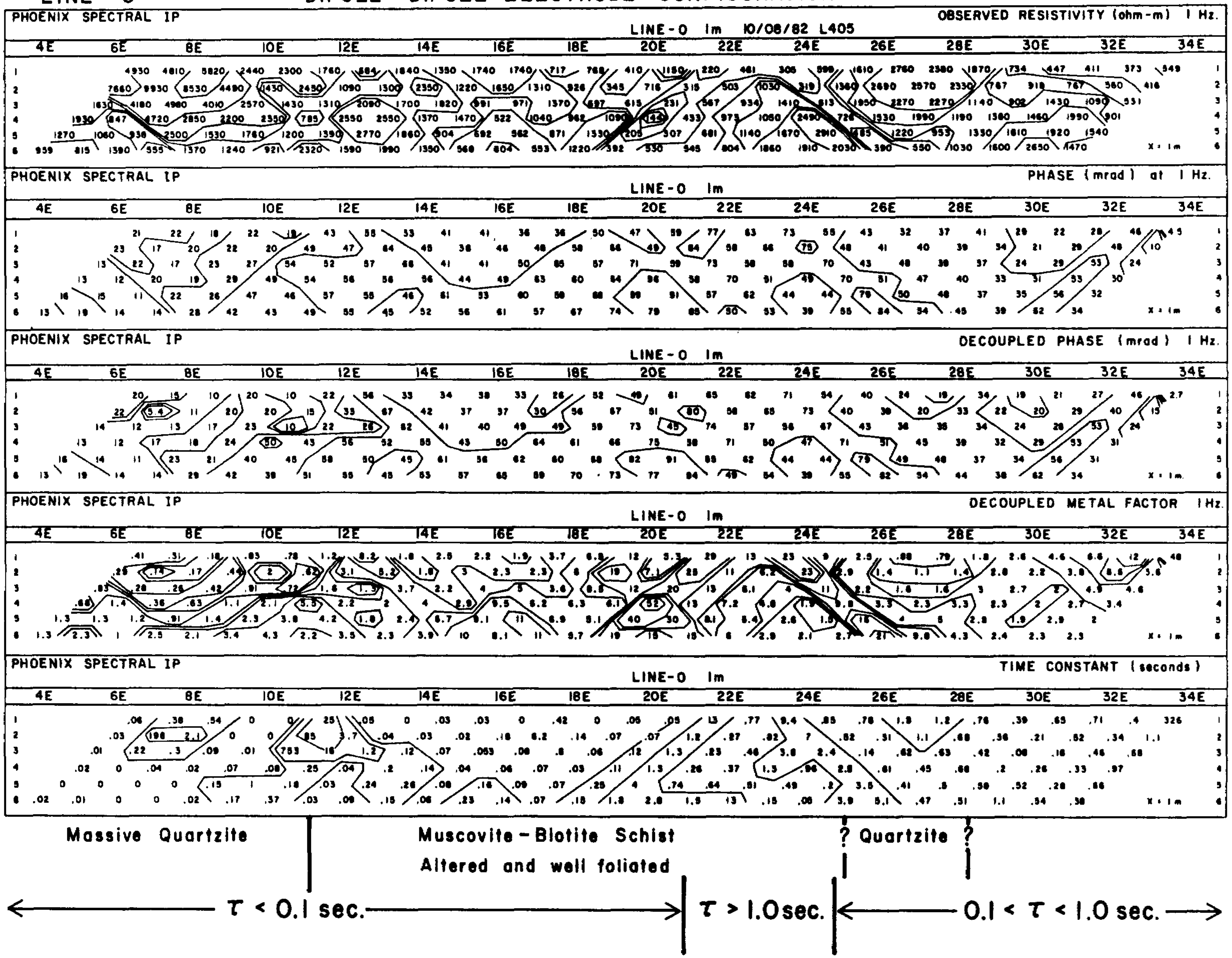
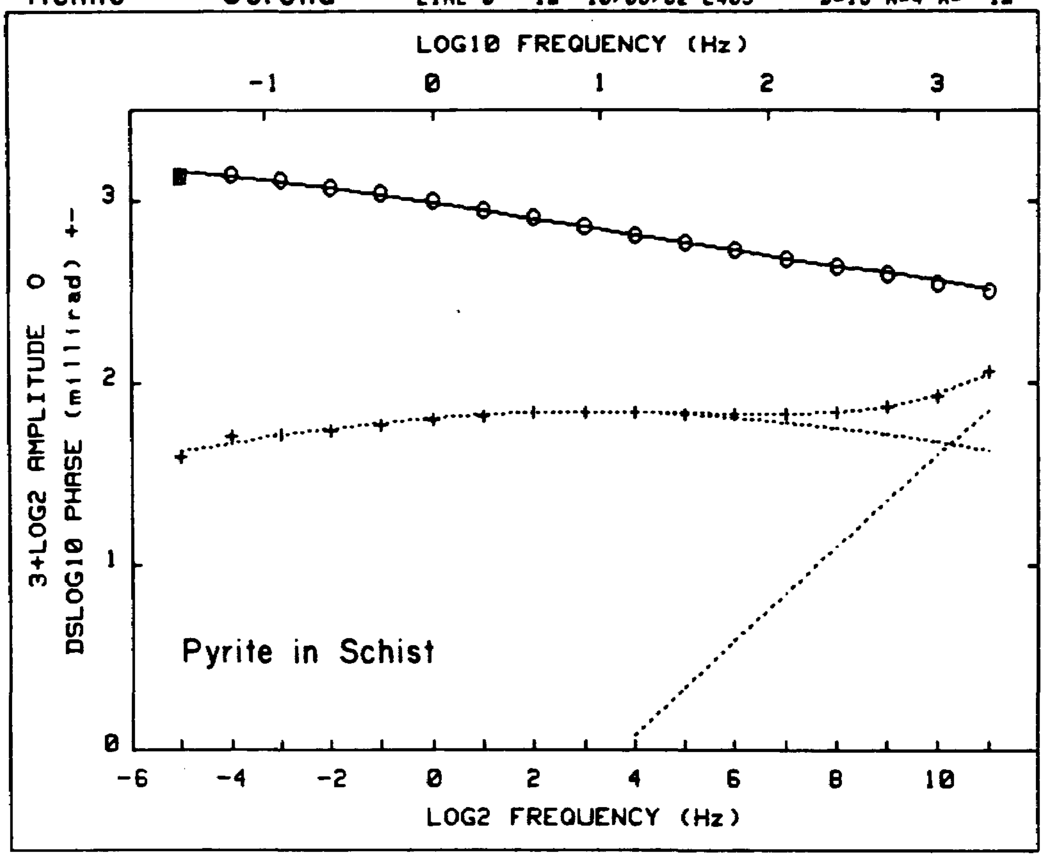


FIGURE 1

SPECTRAL IP PLOT

Hemlo Corona LINE 8 1m 10/08/82 L405 D=13 N=4 X= 1m



CRL: Number of dispersions= 2

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Iter	Lambda	Rchsq	R0	M1	T1	C1	M2	T2	C2
0	1.E-02	.00020	1.253	.446	1.0E-01	.288	.555	5.9E-06	.650
1	1.E-02	.00017	1.259	.458	9.4E-02	.281	.573	5.9E-06	.696
2	1.E-03	.00016	1.268	.483	7.5E-02	.265	.608	5.9E-06	.797
3	1.E-04	.00015	1.270	.488	7.1E-02	.262	.573	7.2E-06	.839
4	1.E-04	.00015	1.270	.489	7.0E-02	.262	.491	9.0E-06	.852
Pct Std Deviations			1.2	5.7	23.7	6.9	633.7	1658.7	25.0
Correlation Matrix			1.000						
			.899	1.000					
			-.556	-.848	1.000				
			-.925	-.981	.769	1.000			
			-.471	-.614	.651	.541	1.000		
			.483	.635	-.673	-.558	-.999	1.000	
			.657	.854	-.871	-.773	-.882	.901	1.000

Apparent Resistivity Measured at 1 Hz is 1045

Apparent Resistivity Calculated from Inductive Coupling is .016

FIGURE 2

HEMLO AREA , ONTARIO

IP ANOMALY OVER UP-DIP END OF MINERALIZED ZONE CONTAINING GOLDEN SCEPTRE GOLD ZONE

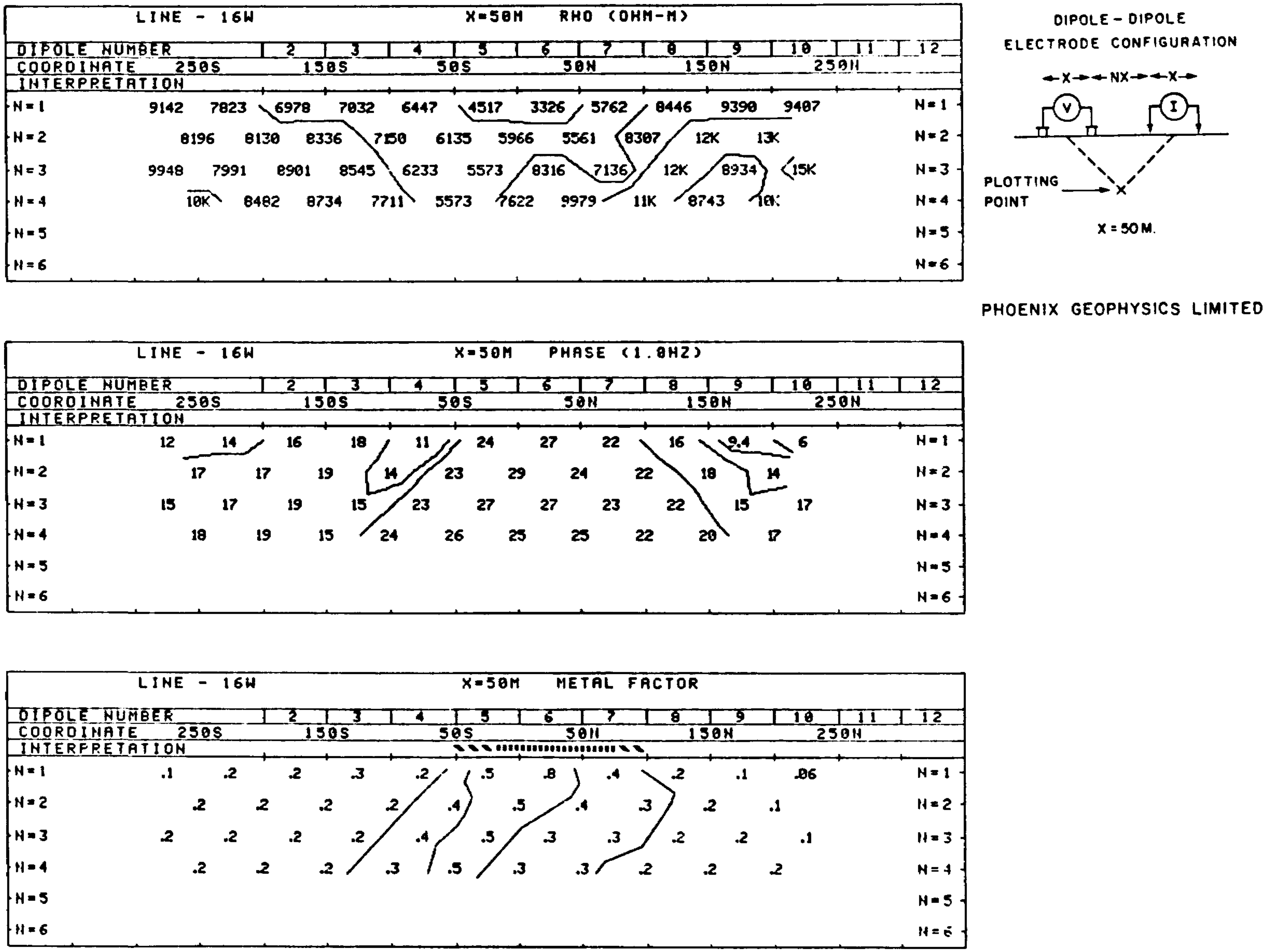
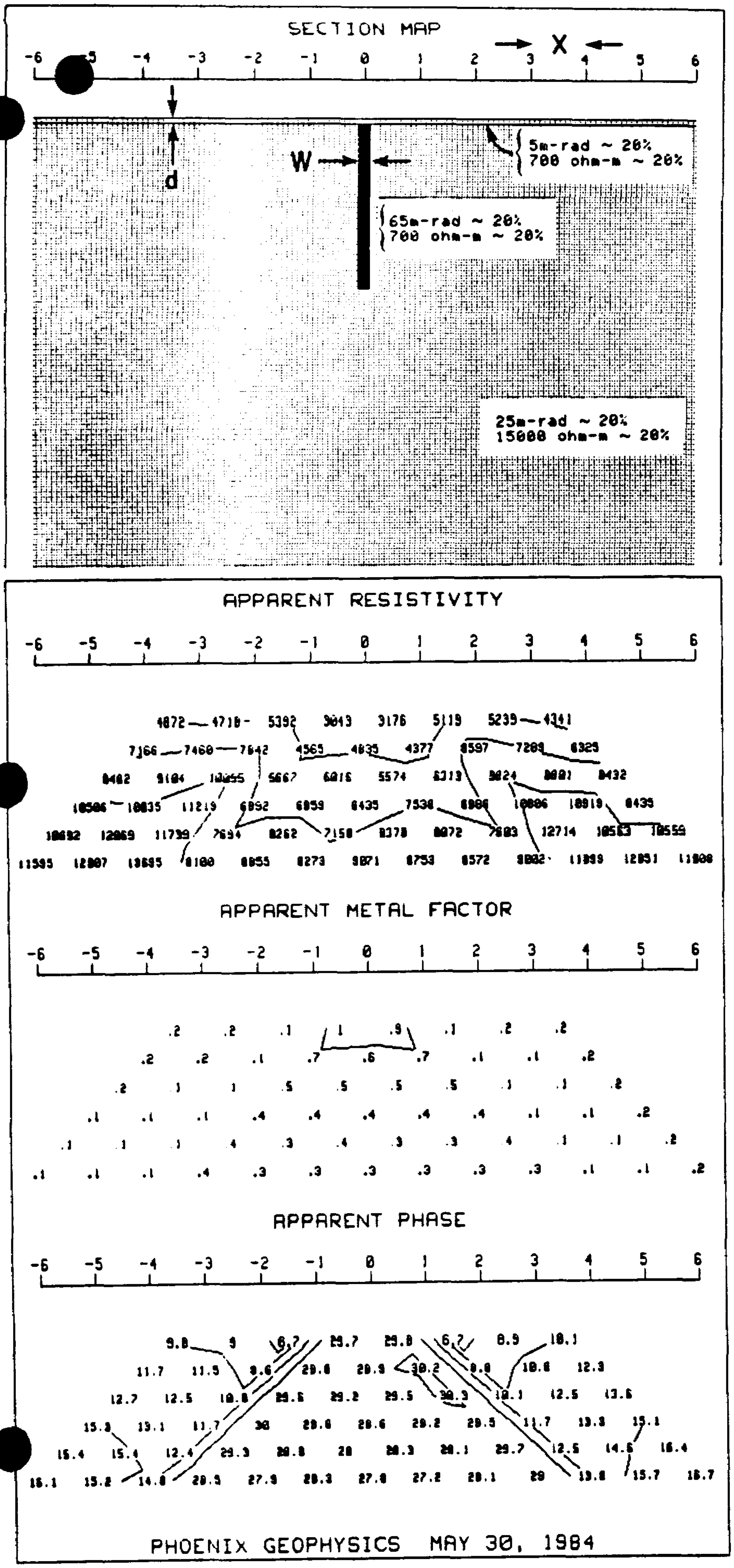


FIGURE 3



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FORWARD PROBLEM SOLUTION

X = 50 meters

W = 10 meters

d = 5.0 meters

DIPOLE - DIPOLE ELECTRODE CONFIGURATION

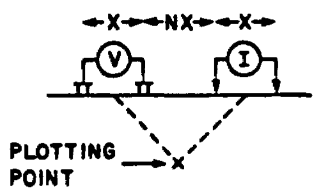
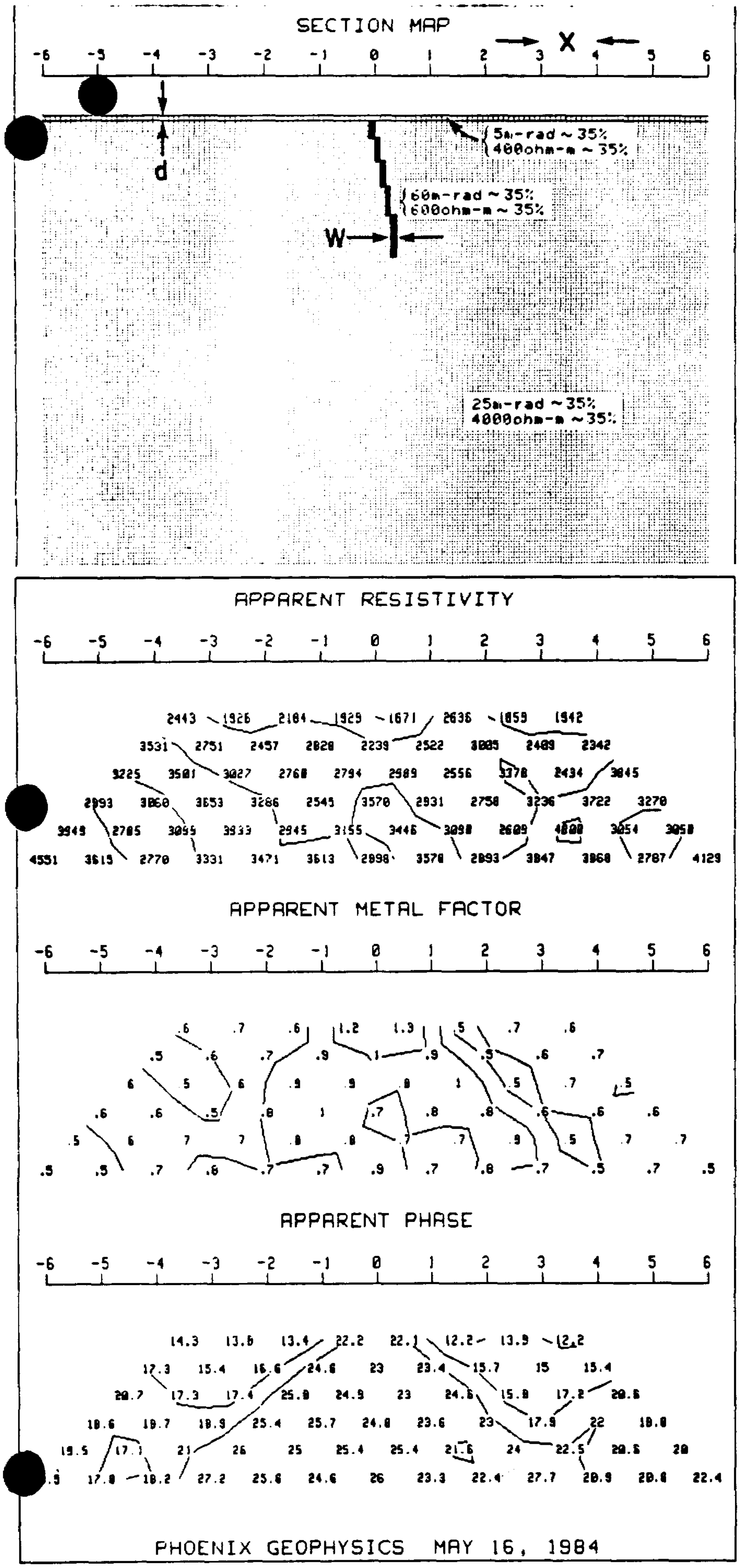


FIGURE 4



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FORWARD PROBLEM SOLUTION

X = 75 meters

W = 7.5 meters

d = 7.5 meters

DIPOLE - DIPOLE ELECTRODE CONFIGURATION

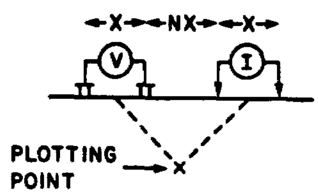
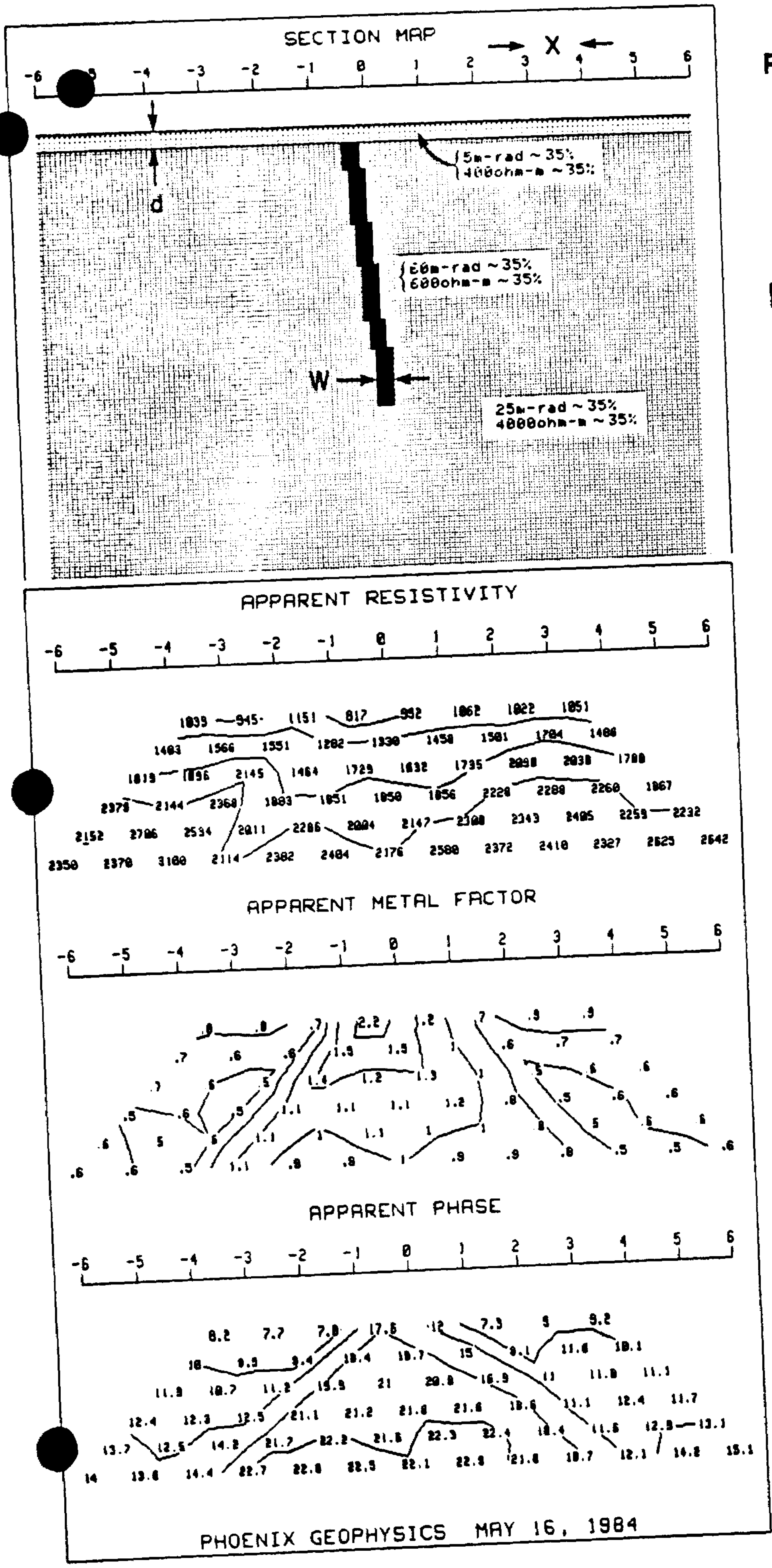


FIGURE 5



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FORWARD PROBLEM SOLUTION

X = 25 meters

W = 7.5 meters

d = 7.5 meters

DIPOLE – DIPOLE ELECTRODE CONFIGURATION

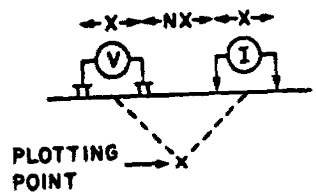


FIGURE 6

HEMLO AREA , ONTARIO

IP and RESISTIVITY SURVEY

RECONNAISSANCE ANOMALY

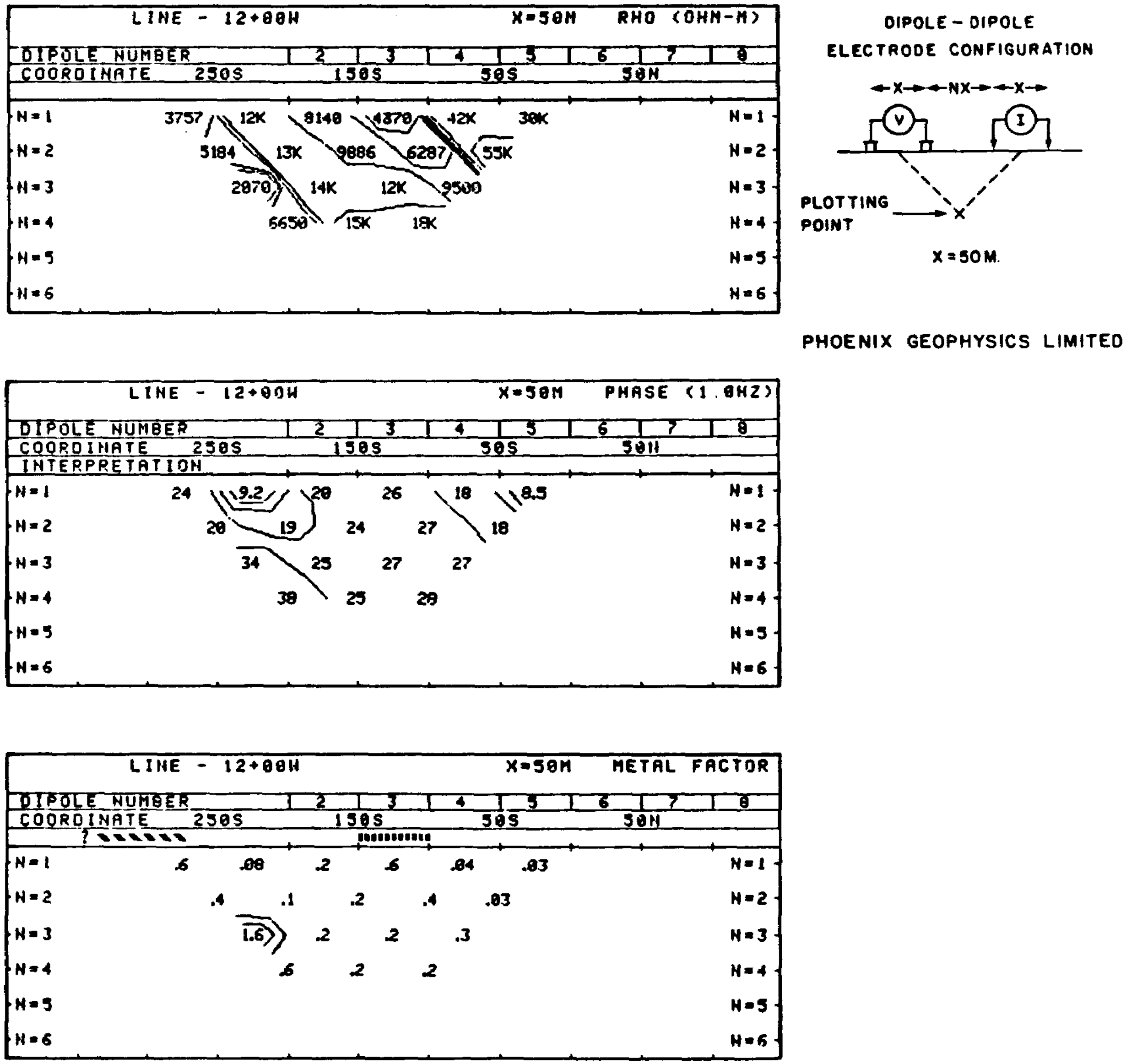
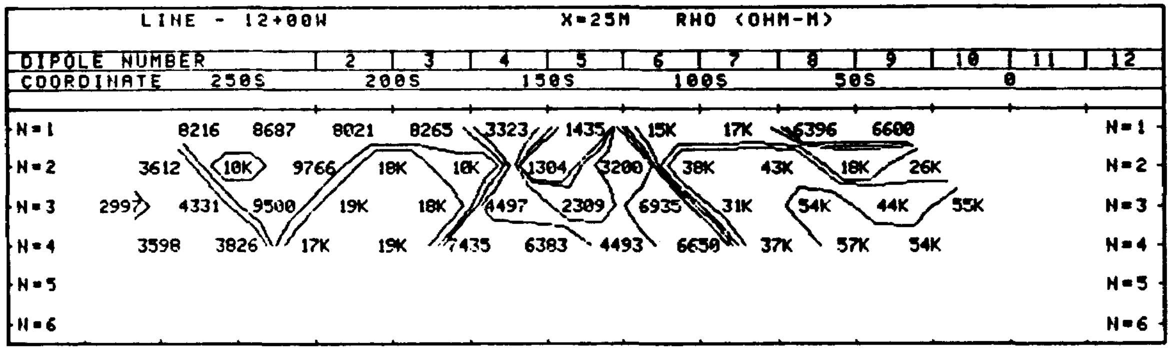
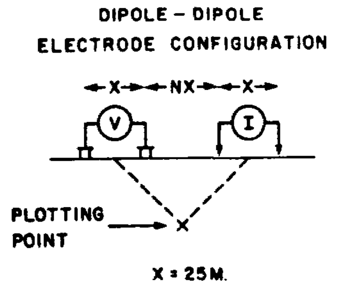


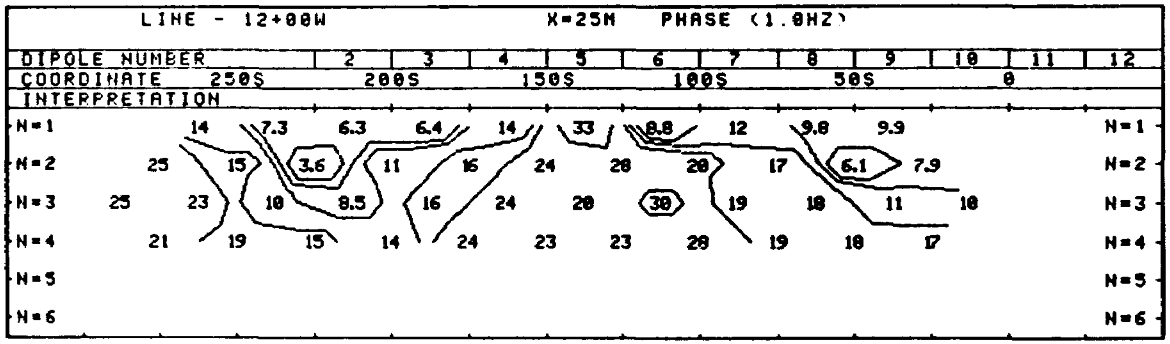
FIGURE 7

HEMLO AREA , ONTARIO
IP and RESISTIVITY SURVEY
DETAILED ANOMALY





PHOENIX GEOPHYSICS LIMITED



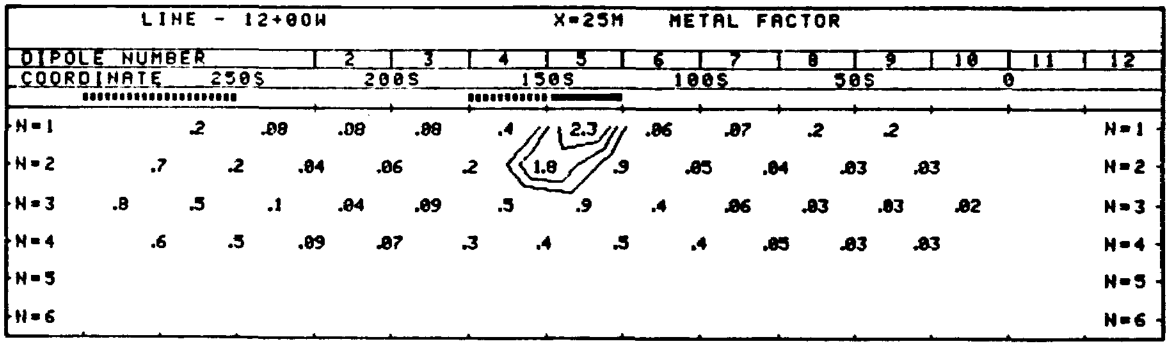
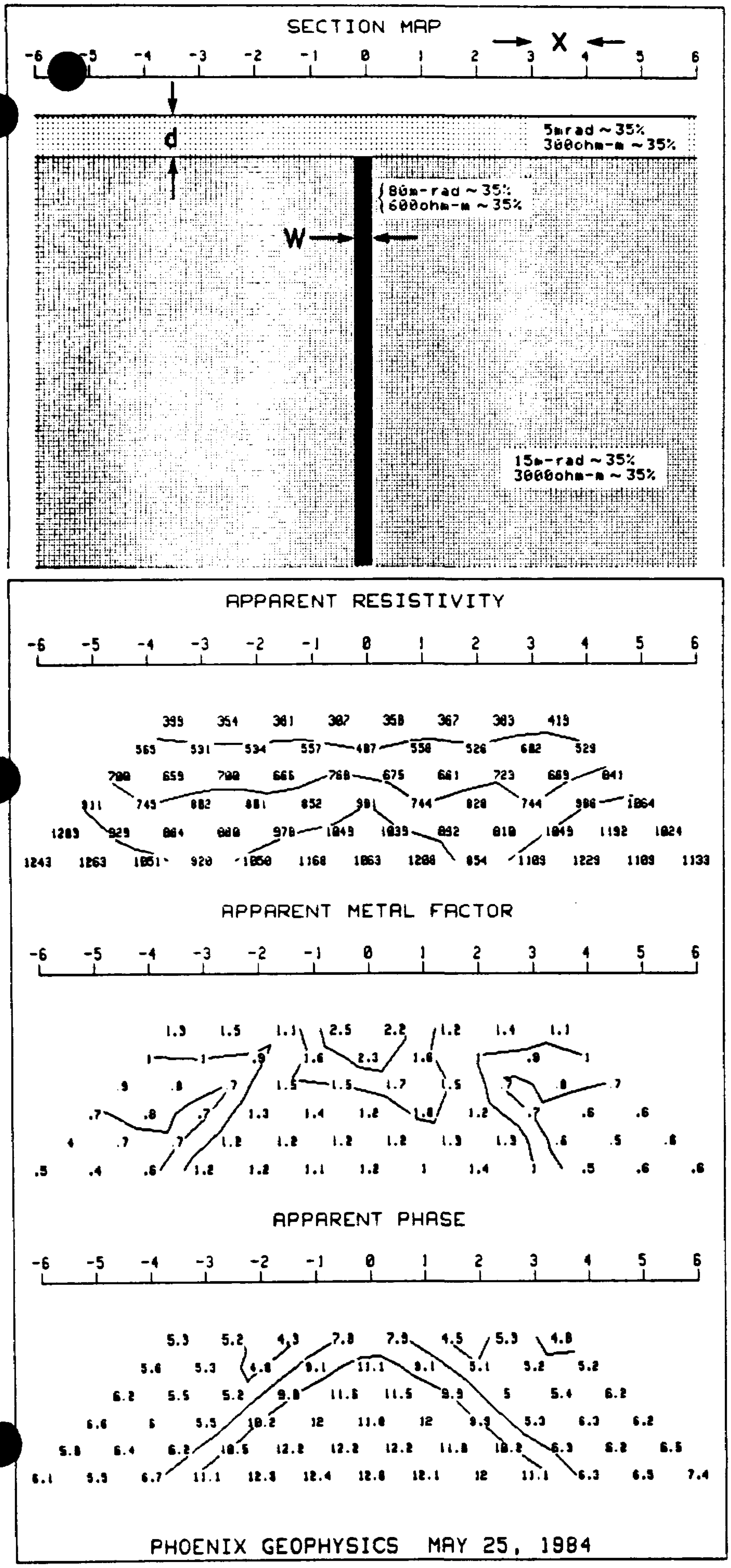


FIGURE 8



PHOENIX GEOPHYSICS LIMITED

FORWARD PROBLEM SOLUTION

X = 25 meters

W = 7.5 meters

d = 19 meters

DIPOLE - DIPOLE ELECTRODE CONFIGURATION

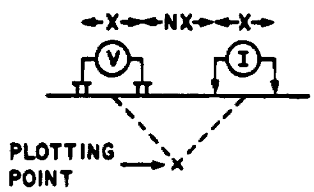
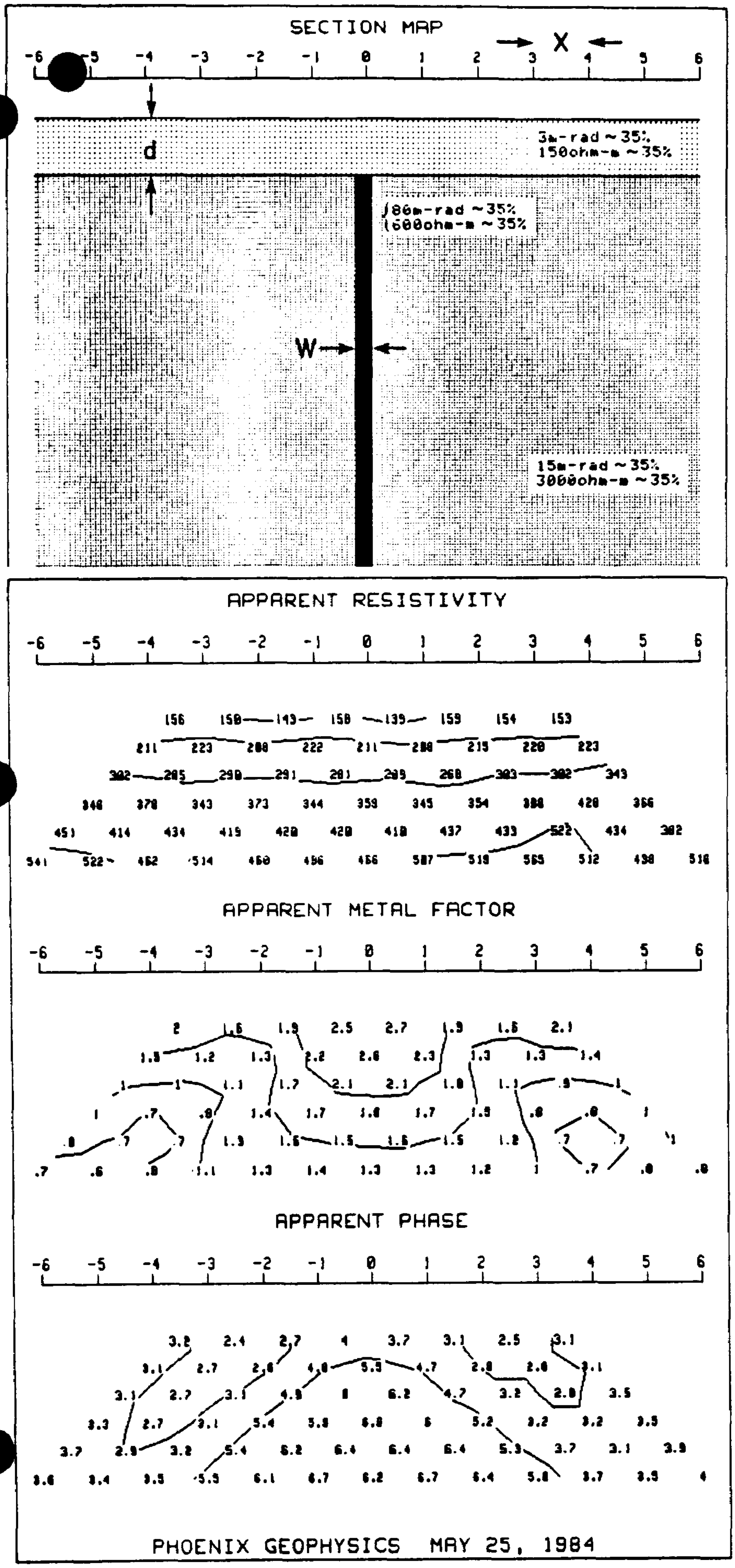


FIGURE 9



PHOENIX GEOPHYSICS LIMITED

FORWARD PROBLEM SOLUTION

X = 25 meters

W = 7.5 meters

d = 25 meters

DIPOLE - DIPOLE ELECTRODE CONFIGURATION

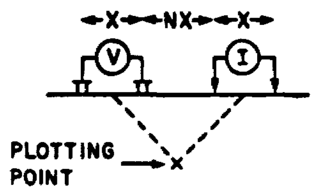
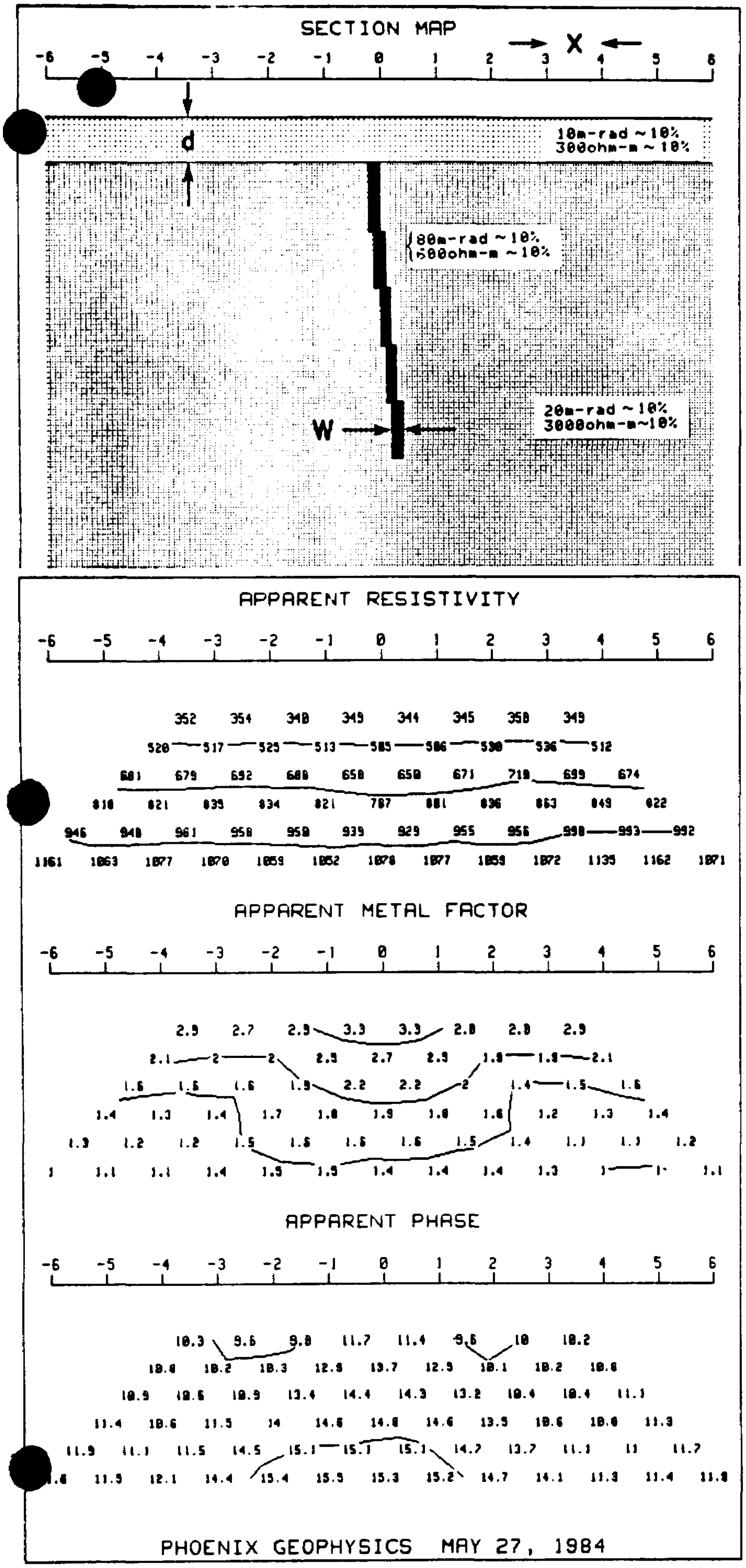


FIGURE 10



PHOENIX GEOPHYSICS LIMITED

FORWARD PROBLEM SOLUTION

X = 25 meters

W = 5.0 meters

d = 19 meters

DIPOLE – DIPOLE ELECTRODE CONFIGURATION

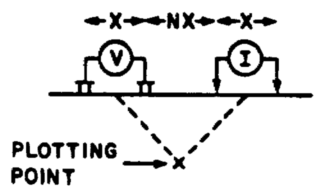
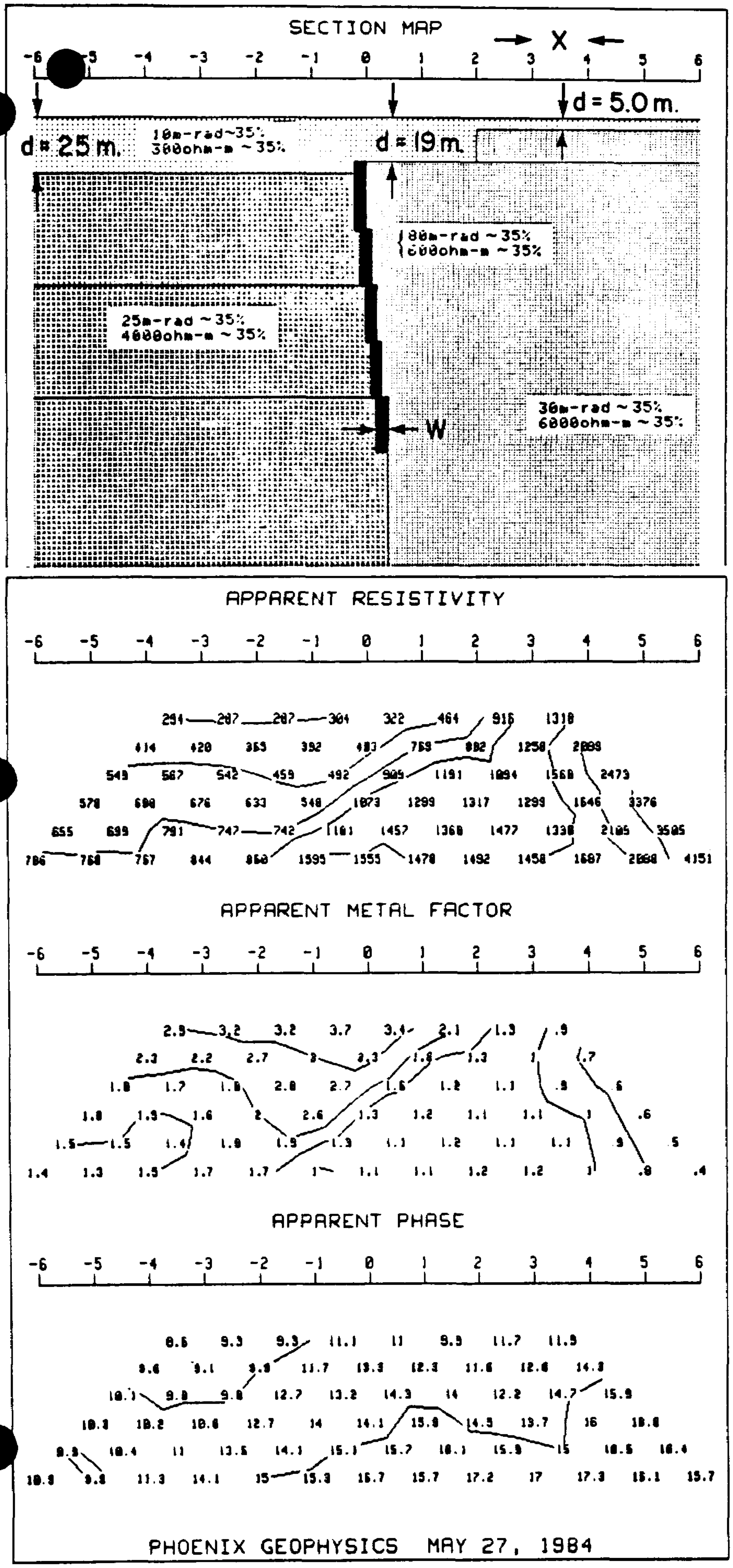


FIGURE 11



PHOENIX GEOPHYSICS LIMITED

FORWARD PROBLEM SOLUTION

X = 25 meters

W = 5.0 meters

DIPOLE - DIPOLE ELECTRODE CONFIGURATION

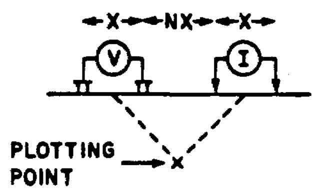
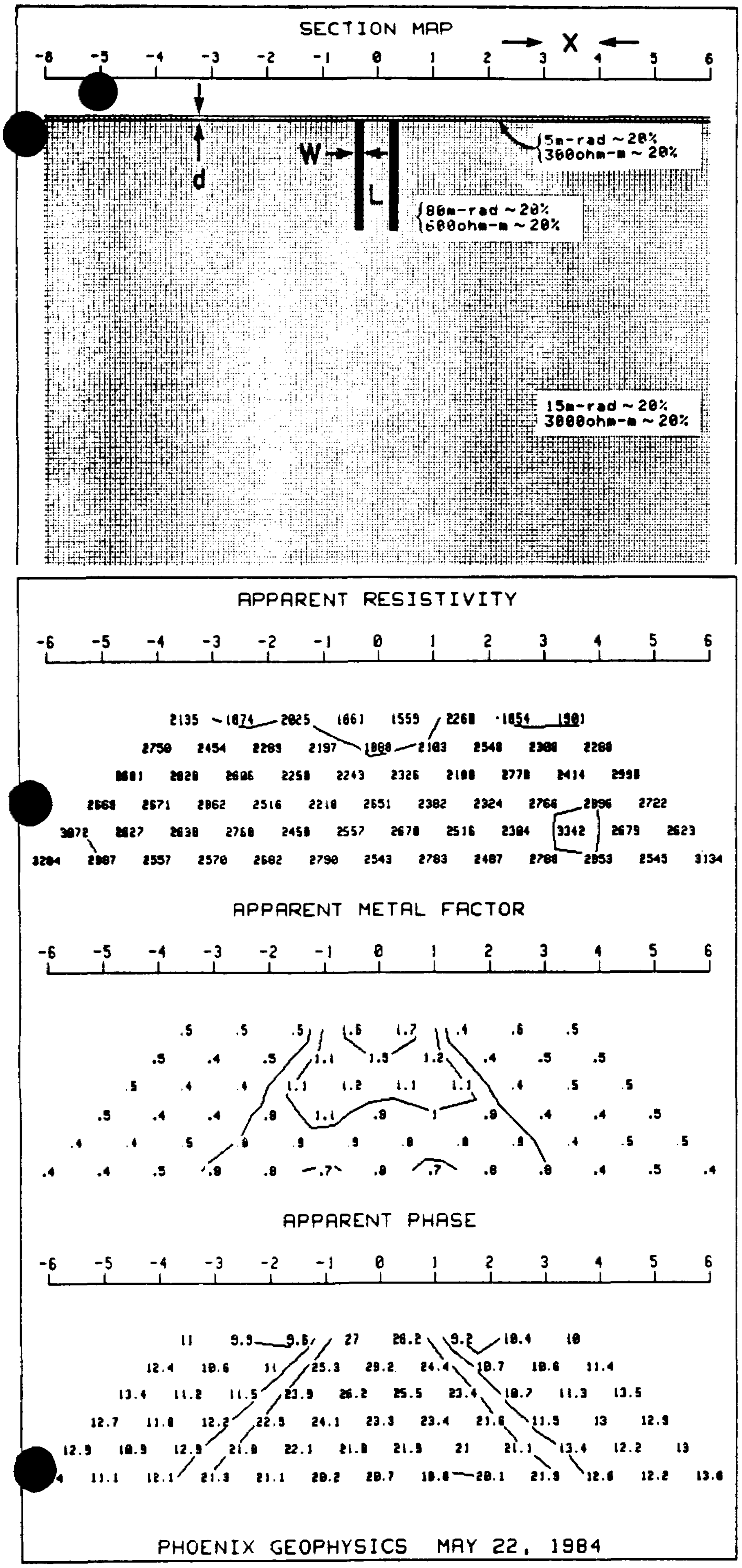


FIGURE 12



PHOENIX GEOPHYSICS LIMITED

FORWARD PROBLEM SOLUTION

X = 75 meters

W = 10 meters

d = 5.0 meters

L = 45 meters

Two Identical Sources

DIPOLE - DIPOLE ELECTRODE CONFIGURATION

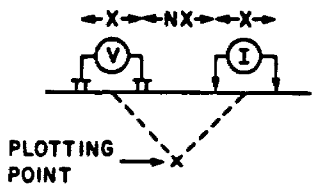
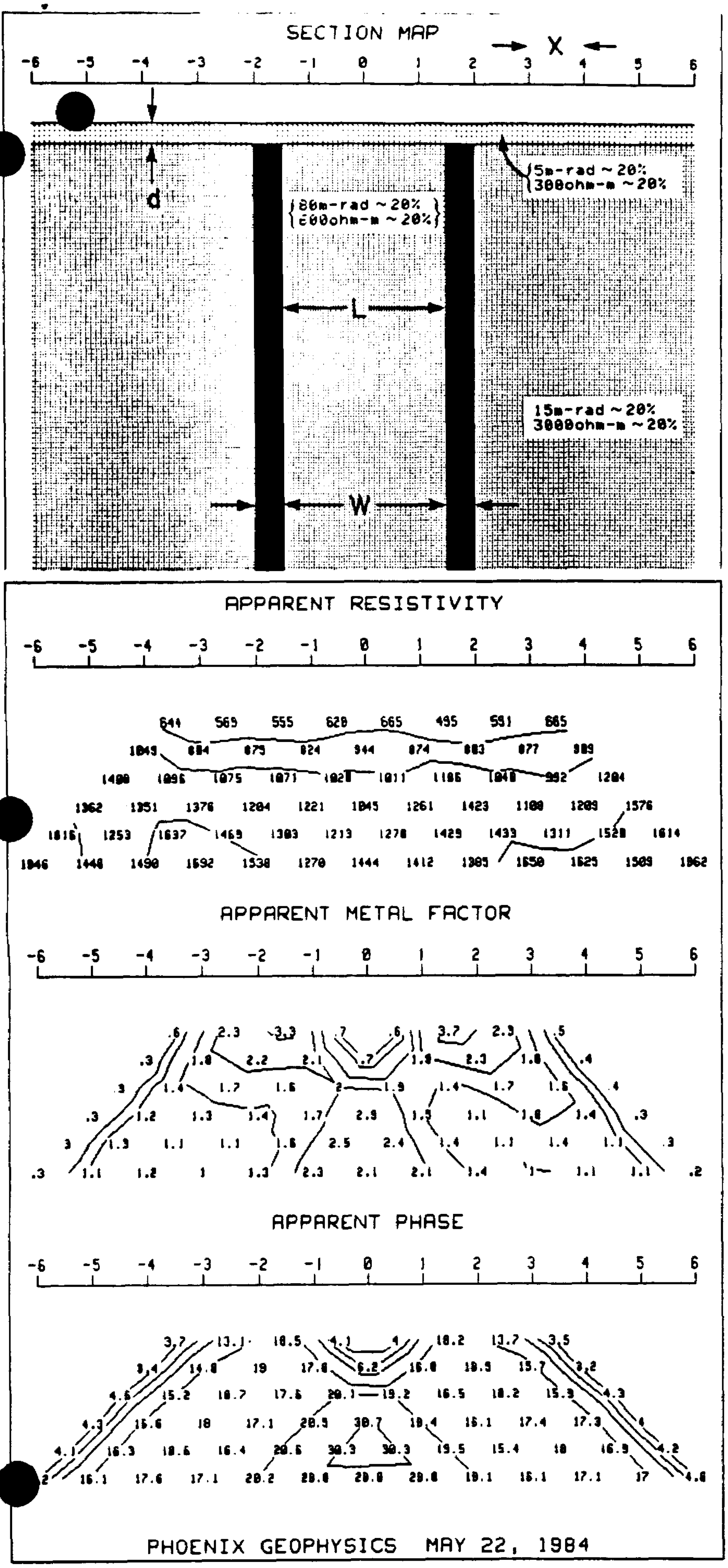


FIGURE 13



PHOENIX GEOPHYSICS LIMITED

FORWARD PROBLEM SOLUTION

X = 15 meters

W = 10 meters

d = 6.0 meters

L = 45 meters

Two Identical Sources

DIPOLE - DIPOLE ELECTRODE CONFIGURATION

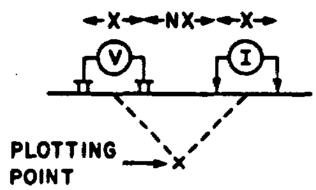
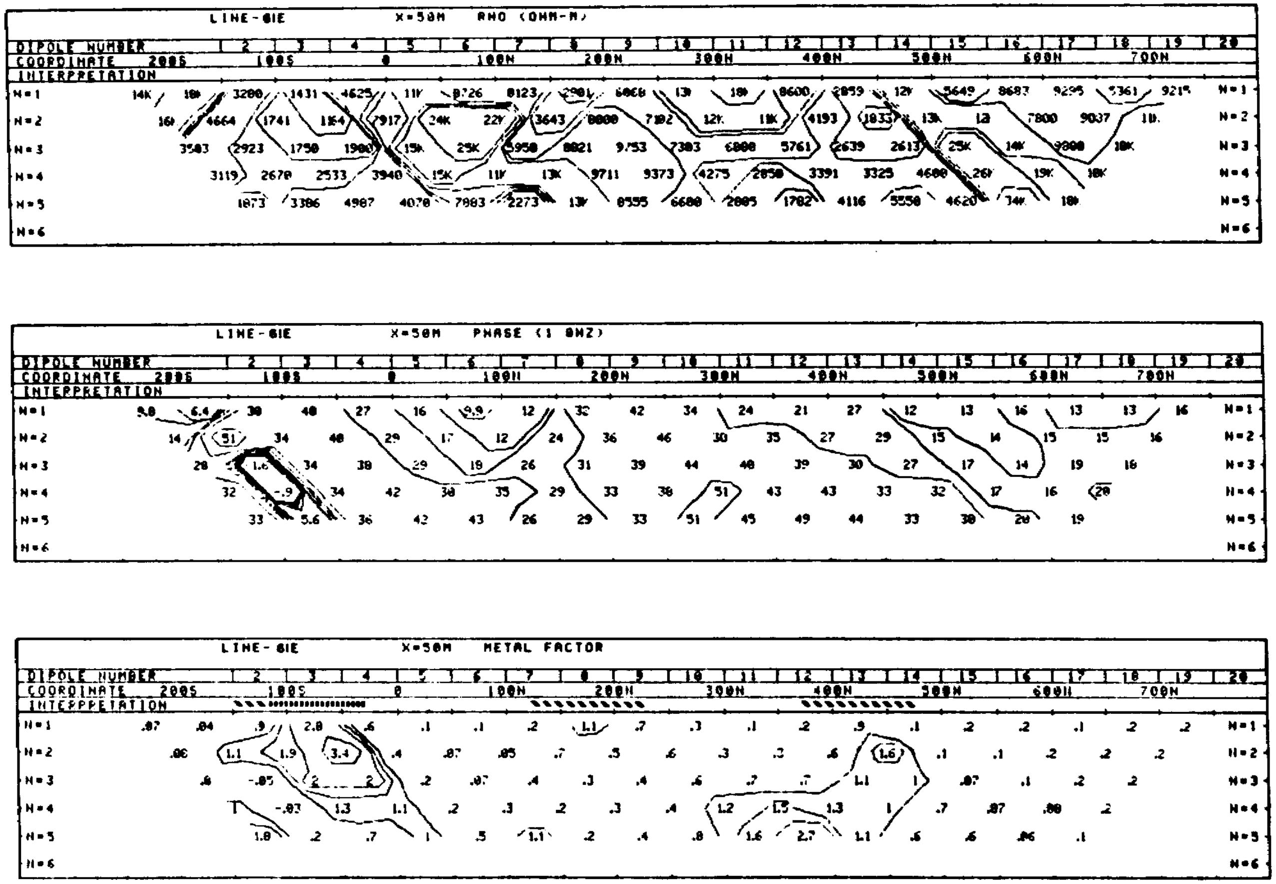


FIGURE 14

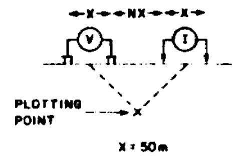


INDUCED POLARIZATION
and
RESISTIVITY RESULTS

HEMLO AREA, ONTARIO

LINE NO. - 6IE

DIPOLE - DIPOLE
ELECTRODE CONFIGURATION

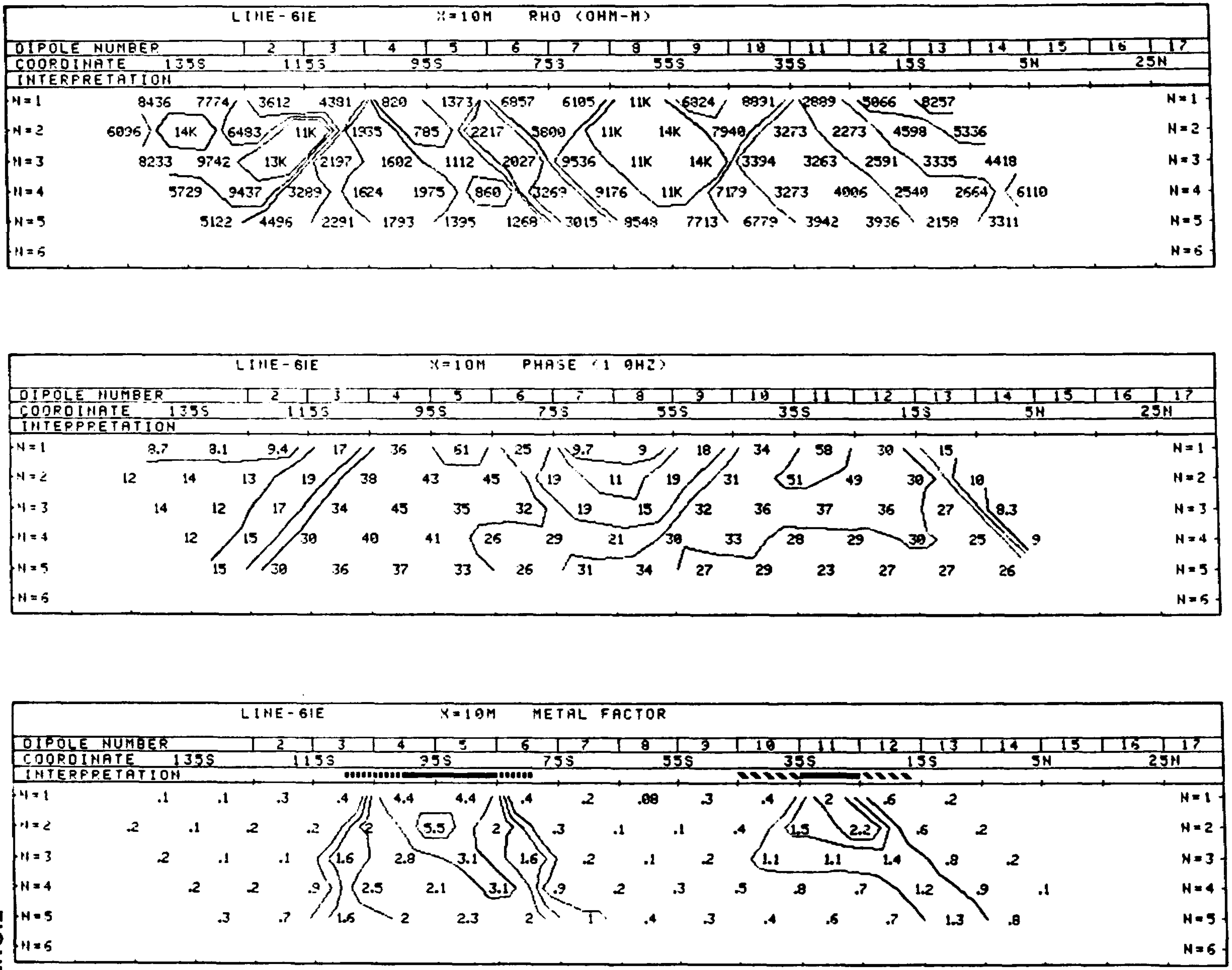


FREQUENCY - 1.0 HZ

NOTE - CONTOURS AT LOGARITHMIC INTERVALS
1, -1.5, -2, -3, -5, -7.5, -10

PHOENIX GEOPHYSICS LIMITED

FIGURE 15

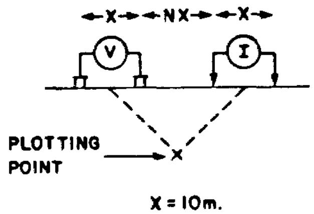


INDUCED POLARIZATION
and
RESISTIVITY RESULTS

HEMLO AREA, ONTARIO

LINE NO.- 61E

DIPOLE - DIPOLE
ELECTRODE CONFIGURATION



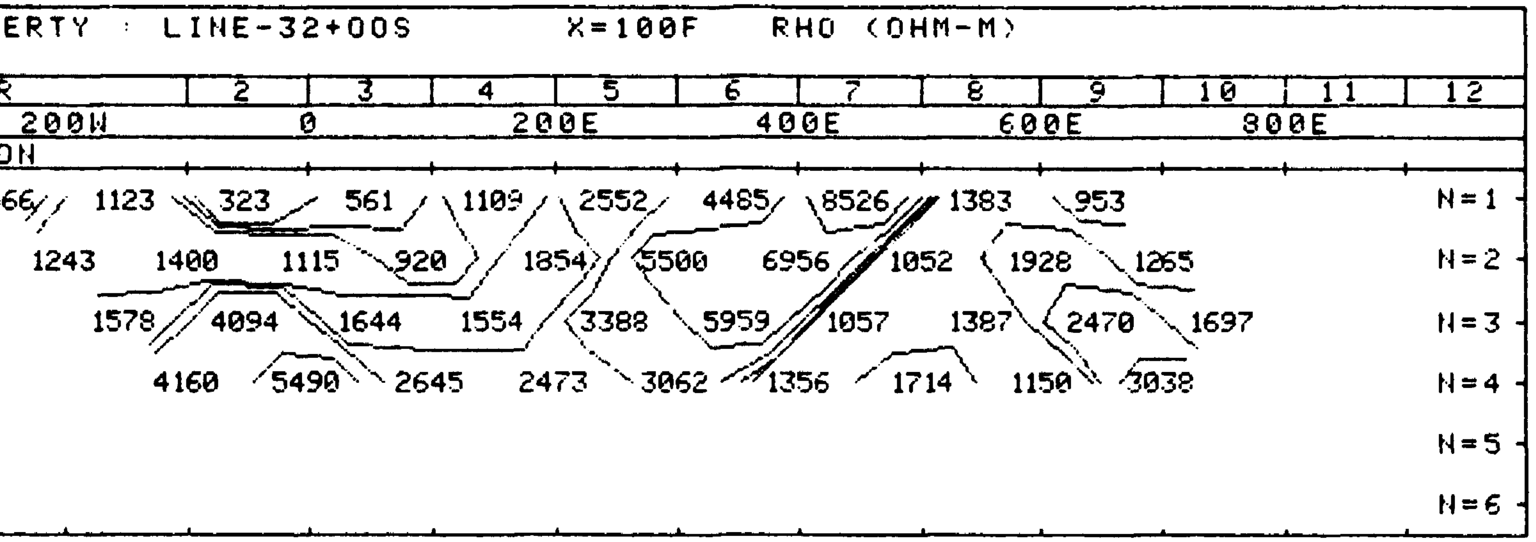
FREQUENCY - 1.0 HZ.

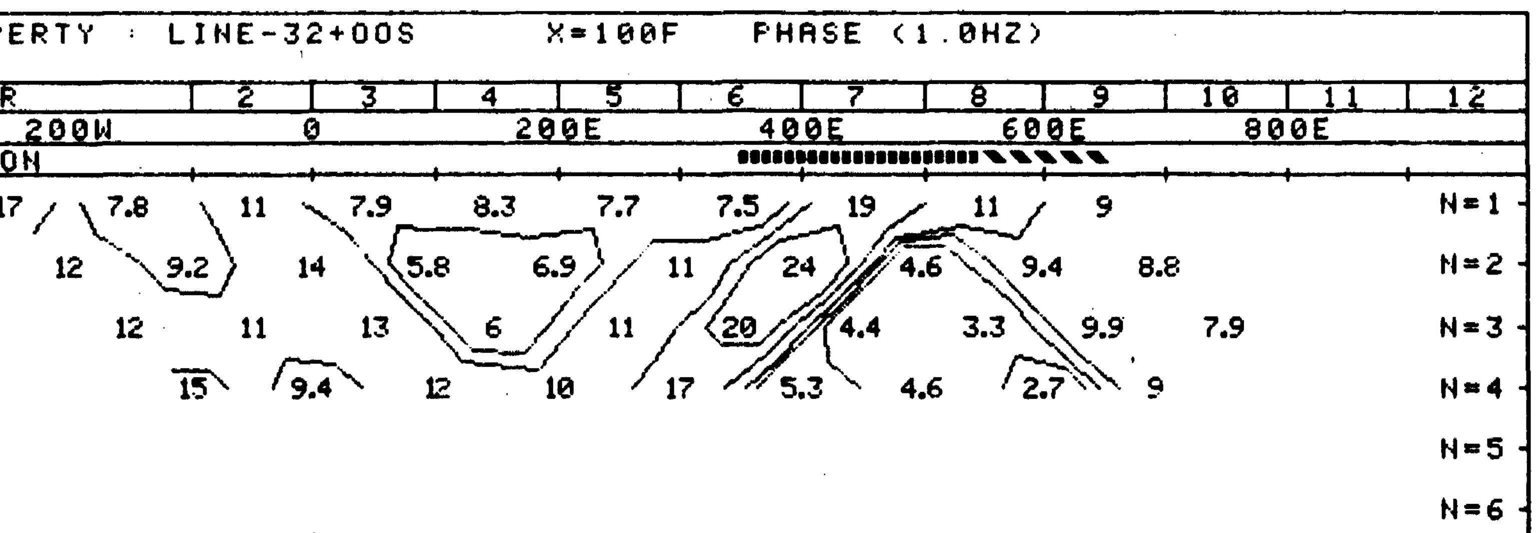
NOTE - CONTOURS AT LOGARITHMIC INTERVALS
1, -1.5, -2, -3, -5, -7.5, -10

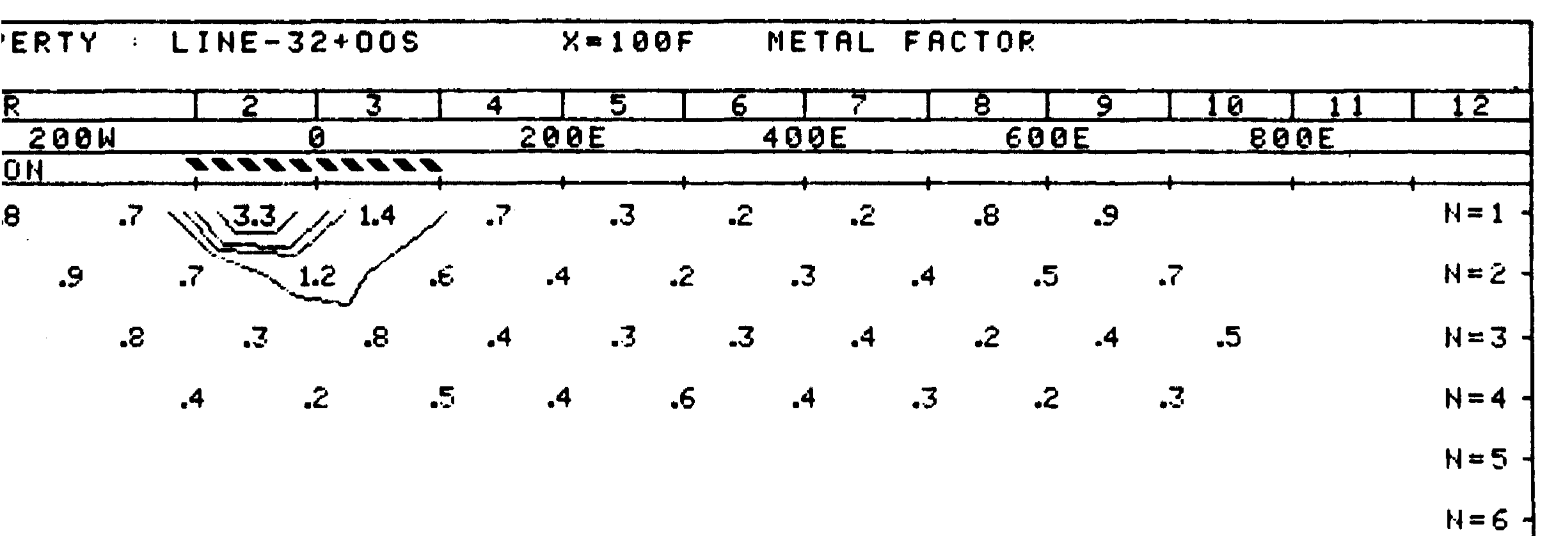
PHOENIX GEOPHYSICS LIMITED

FIGURE 16

DWG. NO -I.P.-5404-16





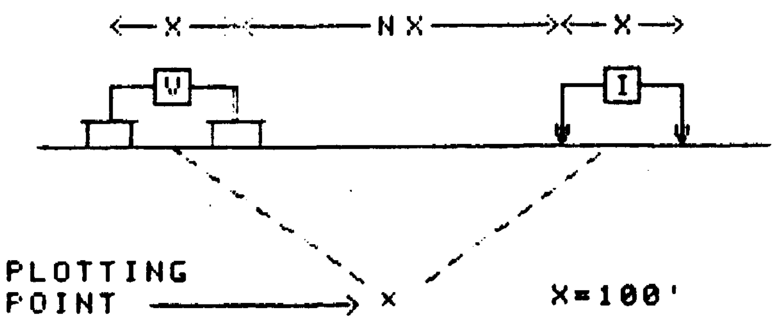


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-32+00S



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

DATE SURVEYED MAY 1985

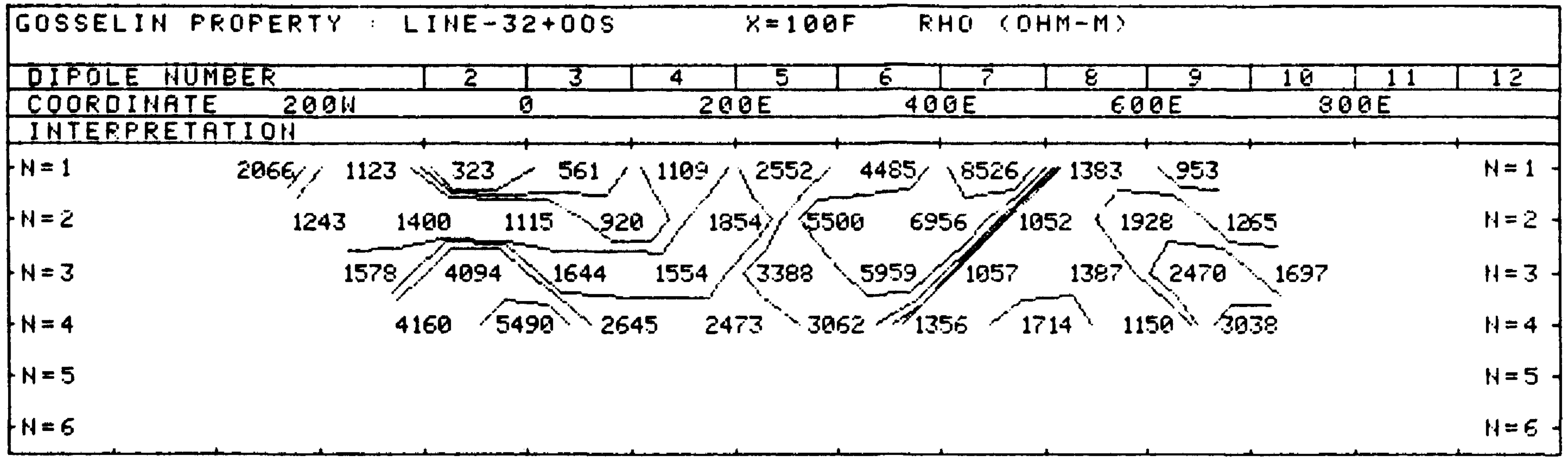
APPROVED P.G. HALLOF

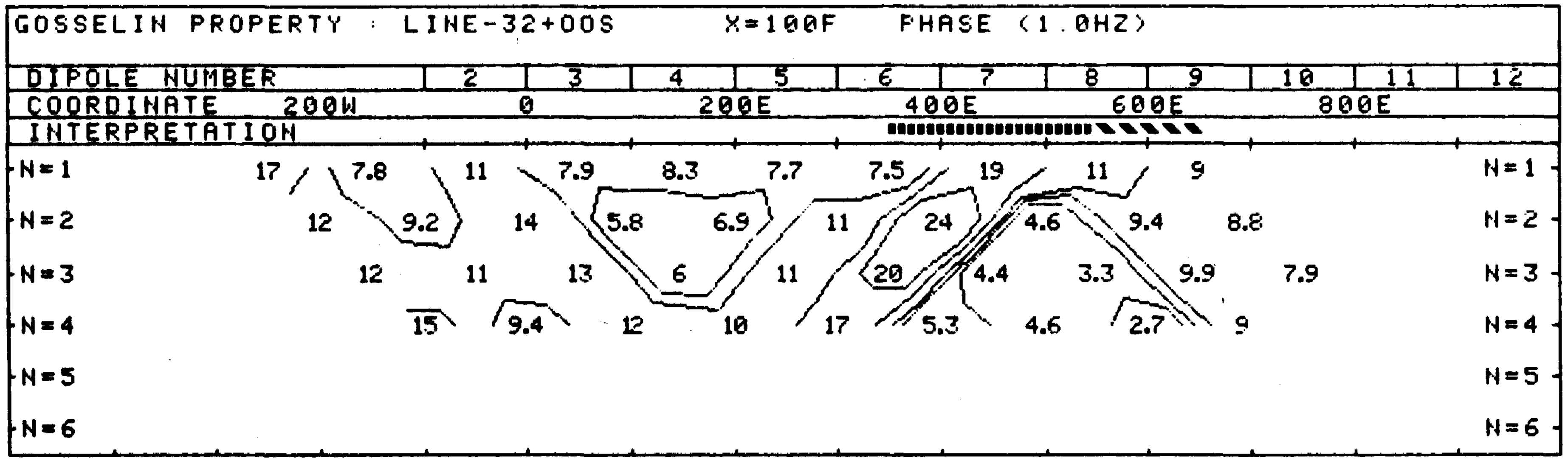
DATE

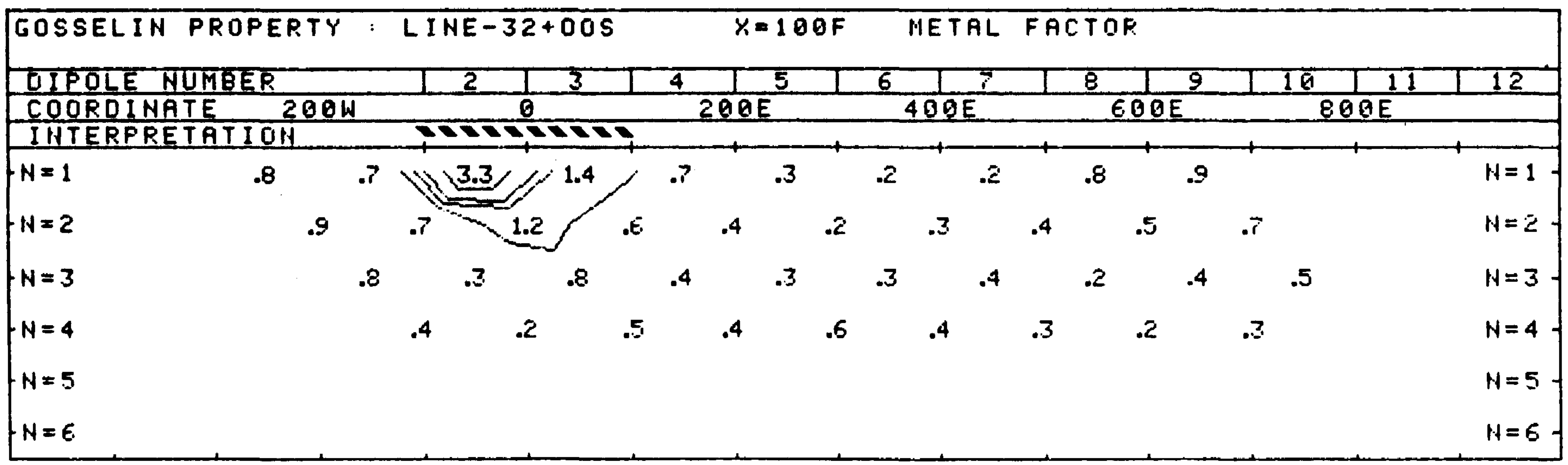
PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

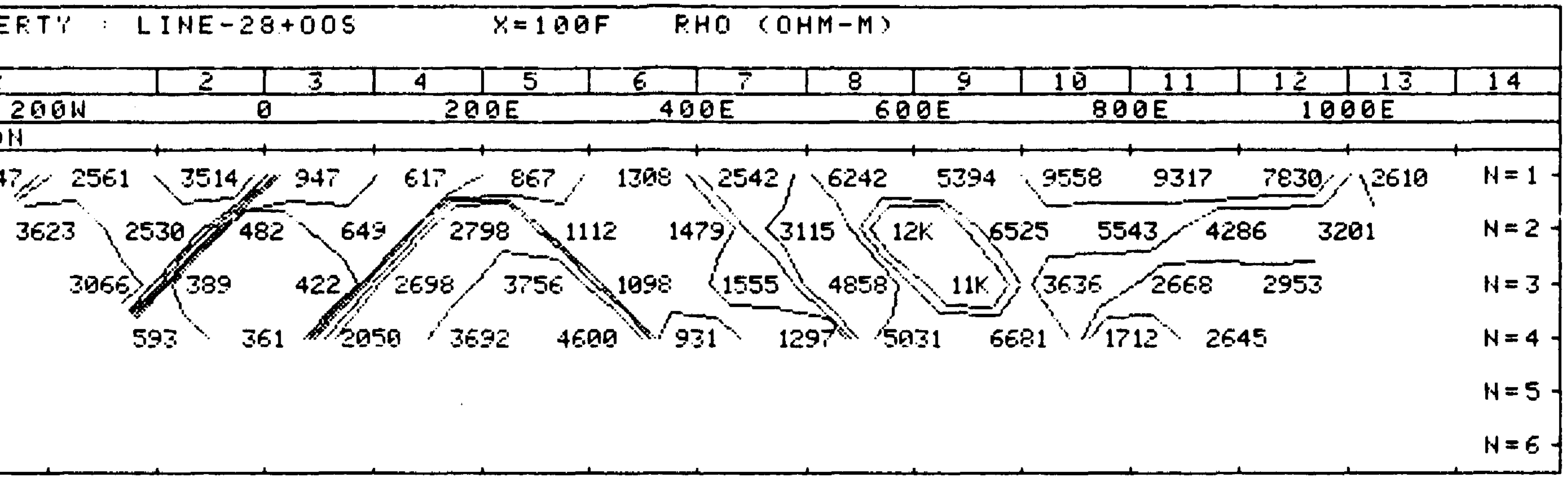
OM 84-357 63.4978

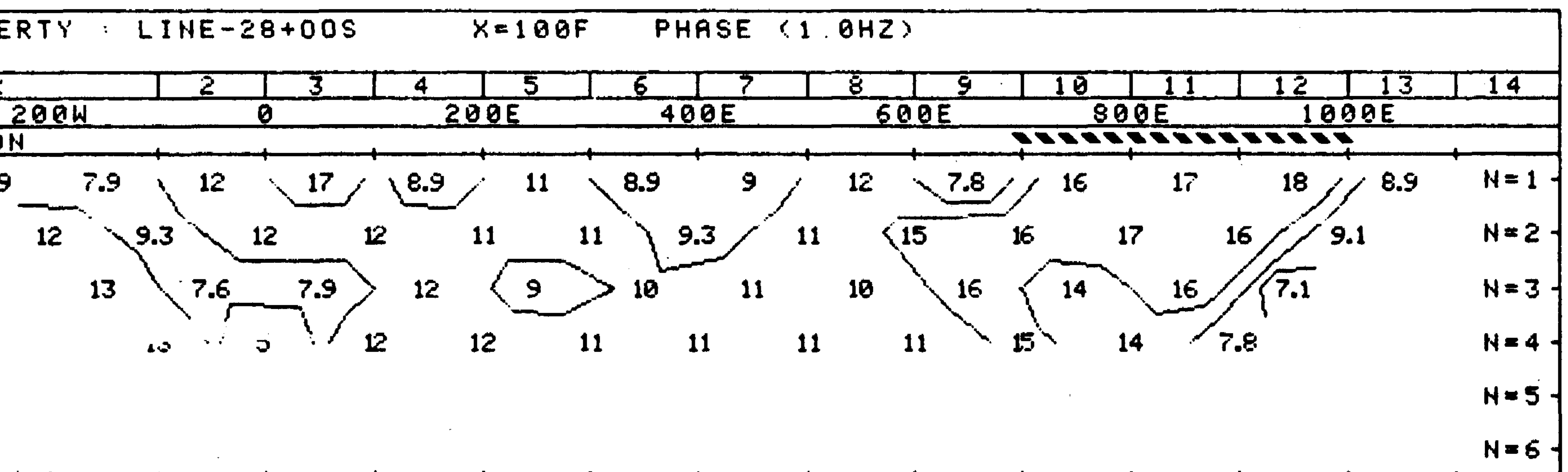

GOSSELIN PROPERTY : LINE-32+00S X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12
COORDINATE 200W 0 200E 400E 600E 800E
INTERPRETATION
N=1 2066 1123 323 561 1109 2552 4485 8526 1383 953 N=1
N=2 1243 1400 1115 920 1854 5500 6956 1052 1928 1265 N=2
N=3 1578 4094 1644 1554 3388 5959 1057 1387 2470 1697 N=3
N=4 4160 5490 2645 2473 3062 1356 1714 1150 3038 N=4
N=5 N=5
N=6 N=6

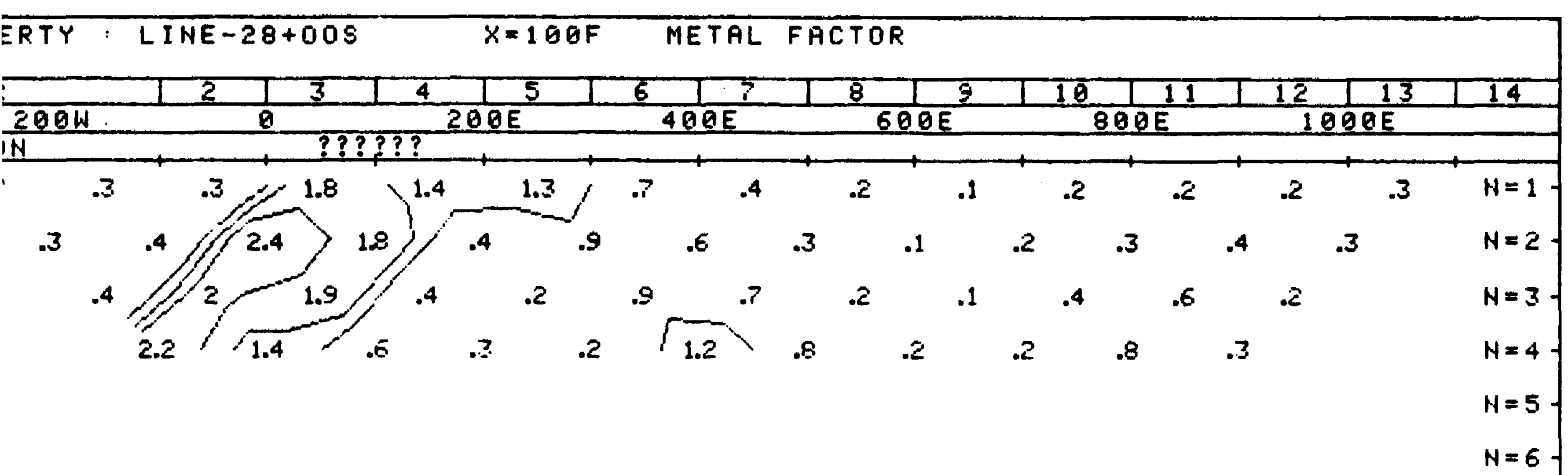

GOSSELIN PROPERTY : LINE-32+00S X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12
COORDINATE 200W 0 200E 400E 600E 800E
INTERPRETATION
N=1 17 7.8 11 7.9 8.3 7.7 7.5 19 11 9 N=1
N=2 12 9.2 14 5.8 6.9 11 24 4.6 9.4 8.8 N=2
N=3 12 11 13 6 11 20 4.4 3.3 9.9 7.9 N=3
N=4 15 9.4 12 10 17 5.3 4.6 2.7 9 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY : LINE-32+00S X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12
COORDINATE 200W 0 200E 400E 600E 800E
INTERPRETATION
N=1 .8 .7 3.3 1.4 .7 .3 .2 .2 .8 .9 N=1
N=2 .9 .7 1.2 .6 .4 .2 .3 .4 .5 .7 N=2
N=3 .8 .3 .8 .4 .3 .3 .4 .2 .4 .5 N=3
N=4 .4 .2 .5 .4 .6 .4 .3 .2 .3 N=4
N=5 N=5
N=6 N=6

DWG. NO.-I.P.-5404-15





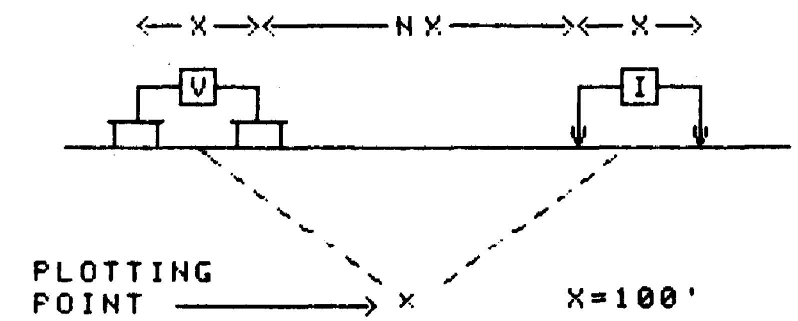


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-28+00S



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS, 1,-1.5 -2,-3,-5,-7.5,-10

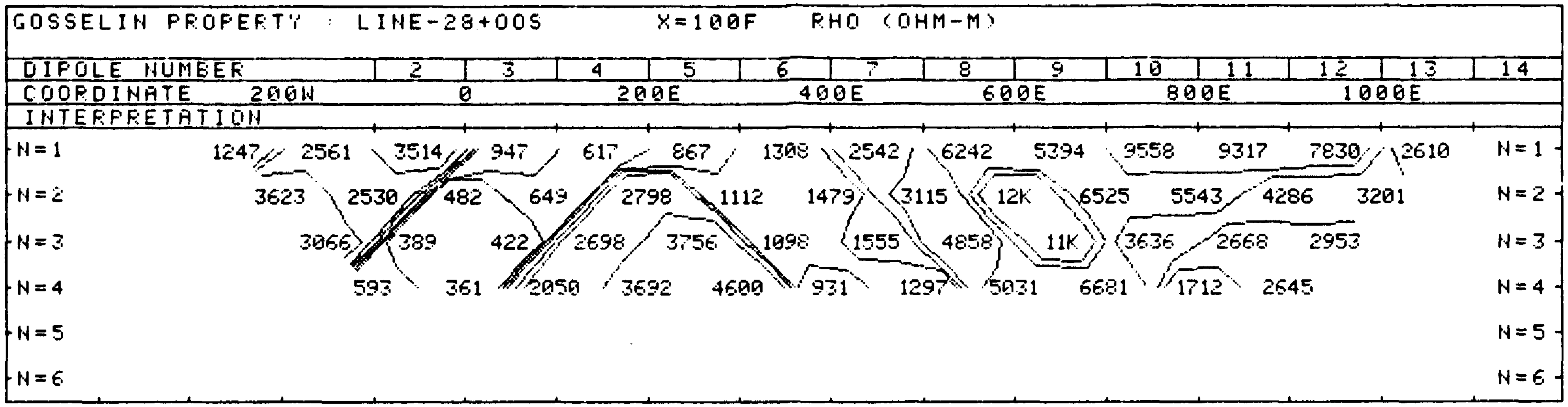
DATE SURVEYED: MAY 1985
APPROVED
DATE

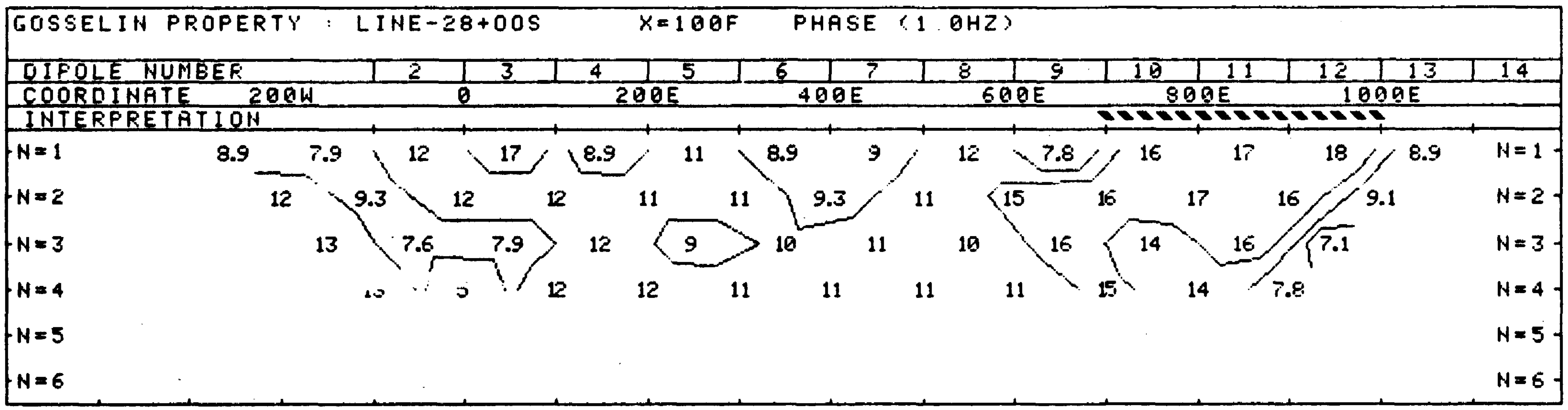
PHOENIX GEOPHYSICS LTD.

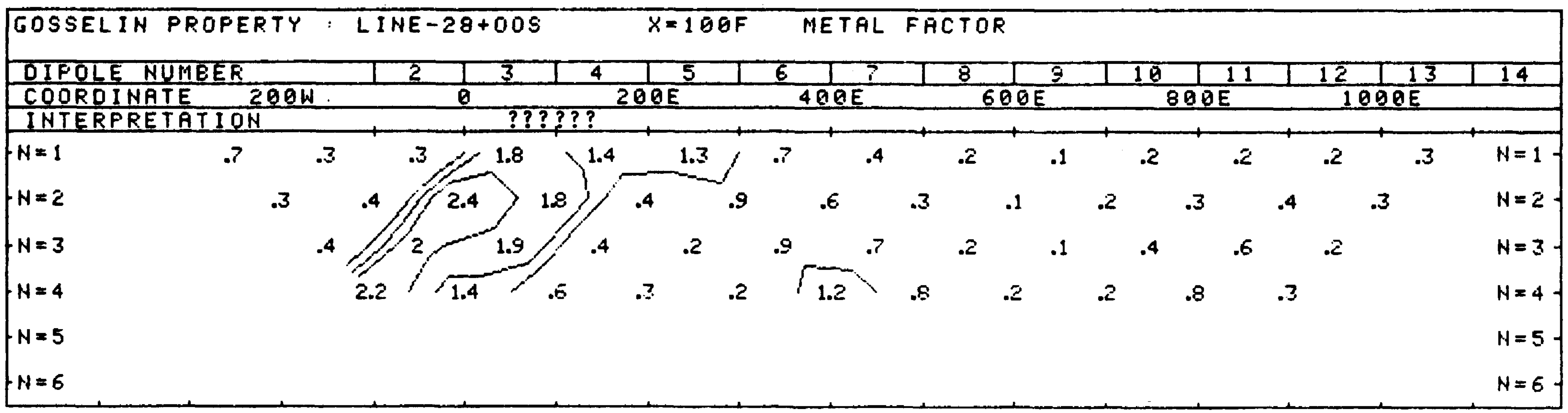
INDUCED POLARIZATION AND RESISTIVITY SURVEY

OM 84-357

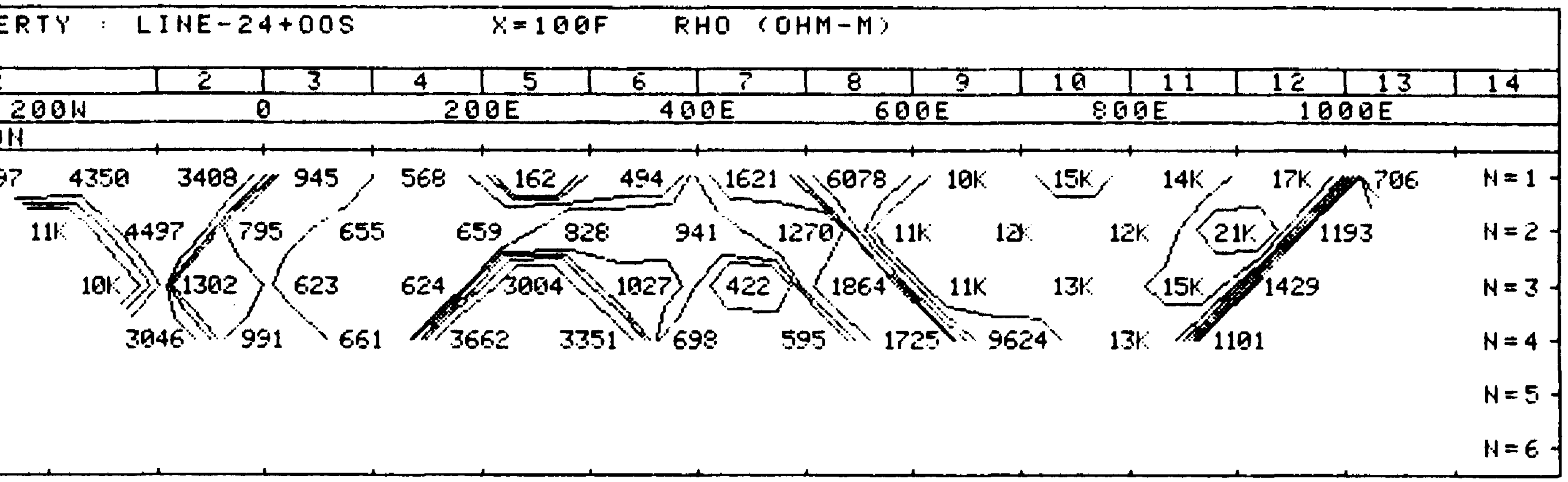
63.4978

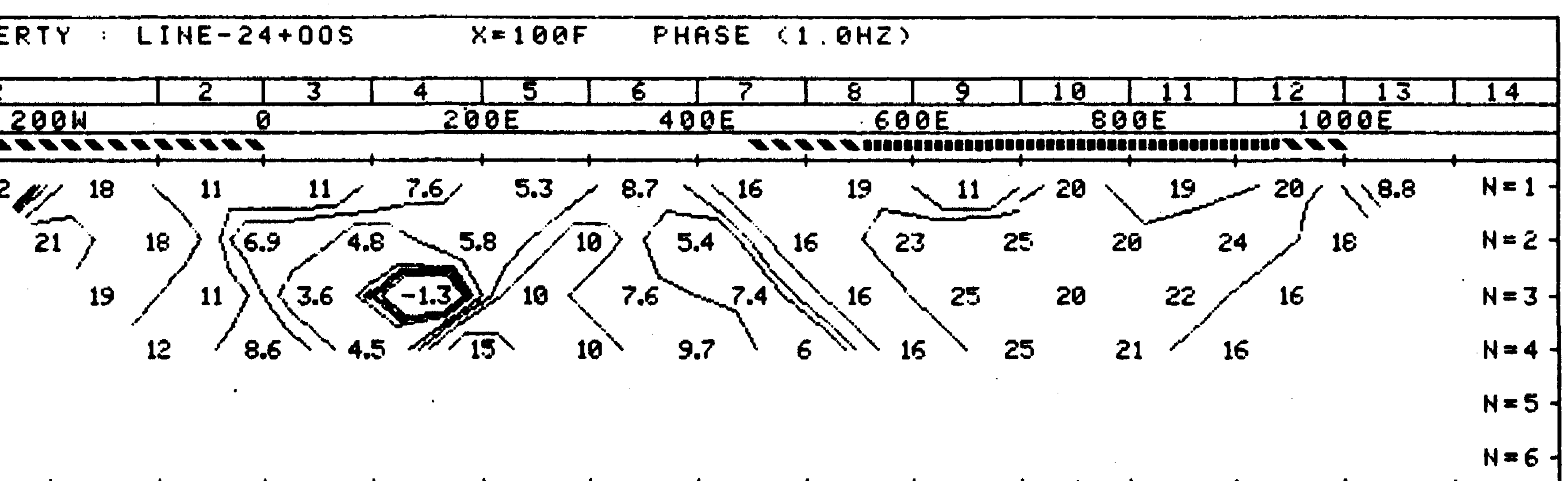

GOSSELIN PROPERTY : LINE-28+00S X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 200W 0 200E 400E 600E 800E 1000E
INTERPRETATION
N=1 1247 2561 3514 947 617 867 1308 2542 6242 5394 9558 9317 7830 2610
N=2 3623 2530 482 649 2798 1112 1479 3115 12K 6525 5543 4286 3201
N=3 3066 389 422 2698 3756 1098 1555 4858 11K 3636 2668 2953
N=4 593 361 2050 3692 4600 931 1297 5031 6681 1712 2645
N=5
N=6

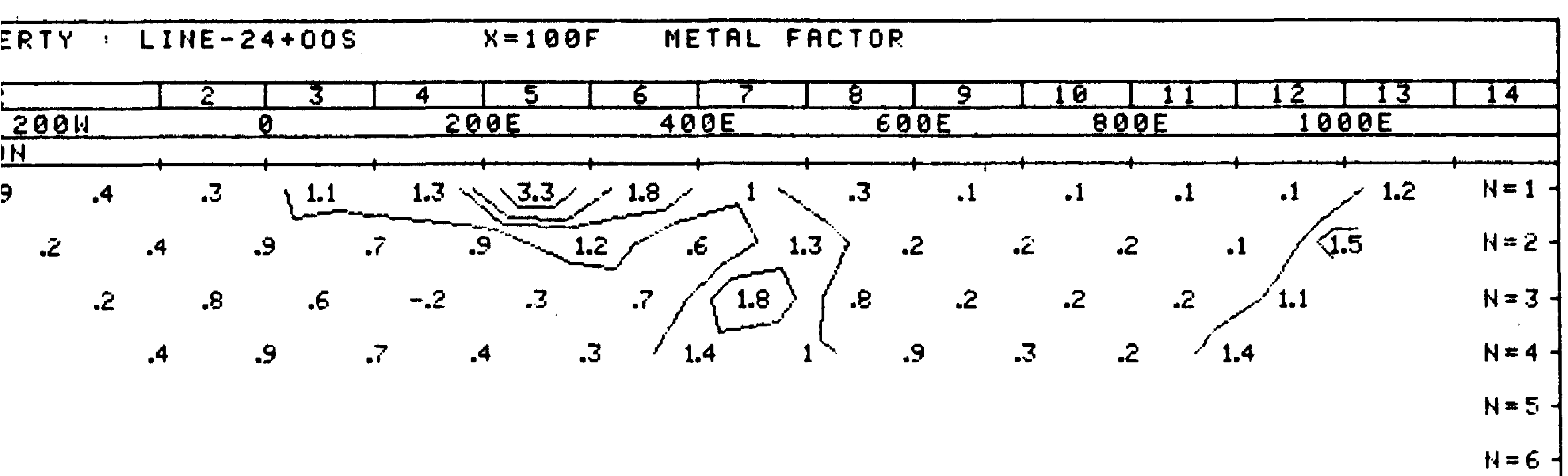

GOSSELIN PROPERTY : LINE-28+00S X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 200W 0 200E 400E 600E 800E 1000E
INTERPRETATION
N=1 8.9 7.9 12 17 8.9 11 8.9 9 12 7.8 16 17 18 8.9
N=2 12 9.3 12 12 11 11 9.3 11 15 16 17 16 9.1
N=3 13 7.6 7.9 12 9 10 11 10 16 14 16 7.1
N=4 13 5 12 12 11 11 11 11 15 14 7.8
N=5
N=6


GOSSELIN PROPERTY : LINE-28+00S X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 200W 0 200E 400E 600E 800E 1000E
INTERPRETATION ??????
N=1 .7 .3 .3 1.8 1.4 1.3 .7 .4 .2 .1 .2 .2 .2 .3
N=2 .3 .4 2.4 1.8 .4 .9 .6 .3 .1 .2 .3 .4 .3
N=3 .4 2 1.9 .4 .2 .9 .7 .2 .1 .4 .6 .2
N=4 2.2 1.4 .6 .3 .2 1.2 .8 .2 .2 .8 .3
N=5
N=6

DWG. NO.-I.P.-5404-14





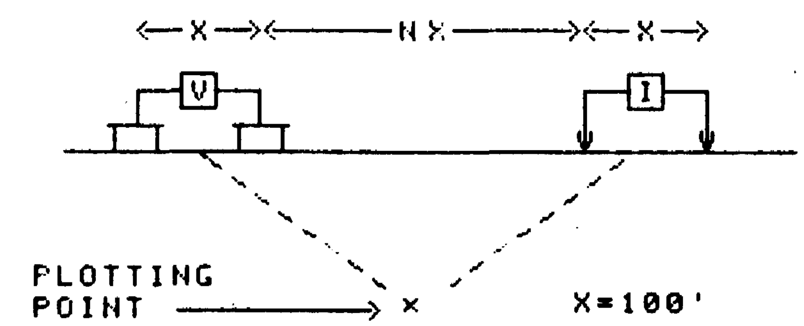


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-24+00S



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS
AT LOGARITHMIC
INTERVALS. 1,-1.5
-2,-3,-5,-7.5,-10

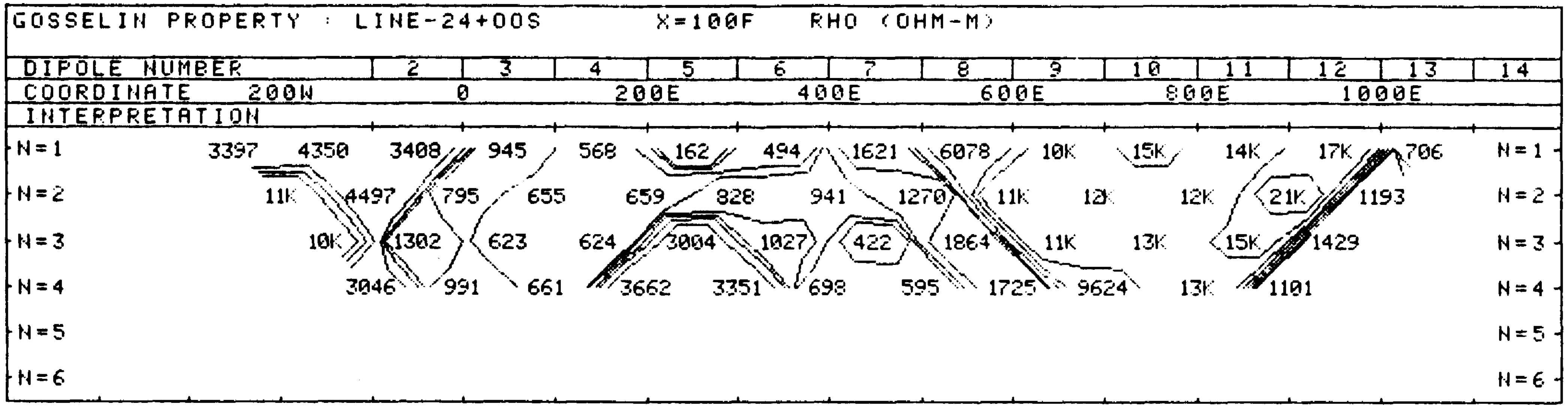
DATE SURVEYED MAY 1985
APPROVED
P. G. HALLOF
DATE

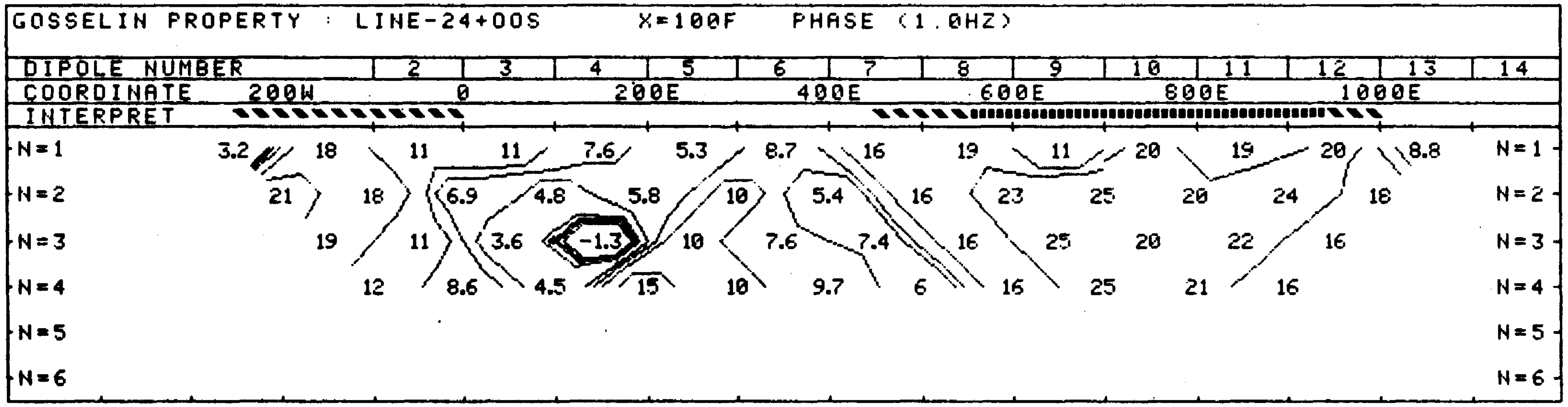
PHOENIX GEOPHYSICS LTD.

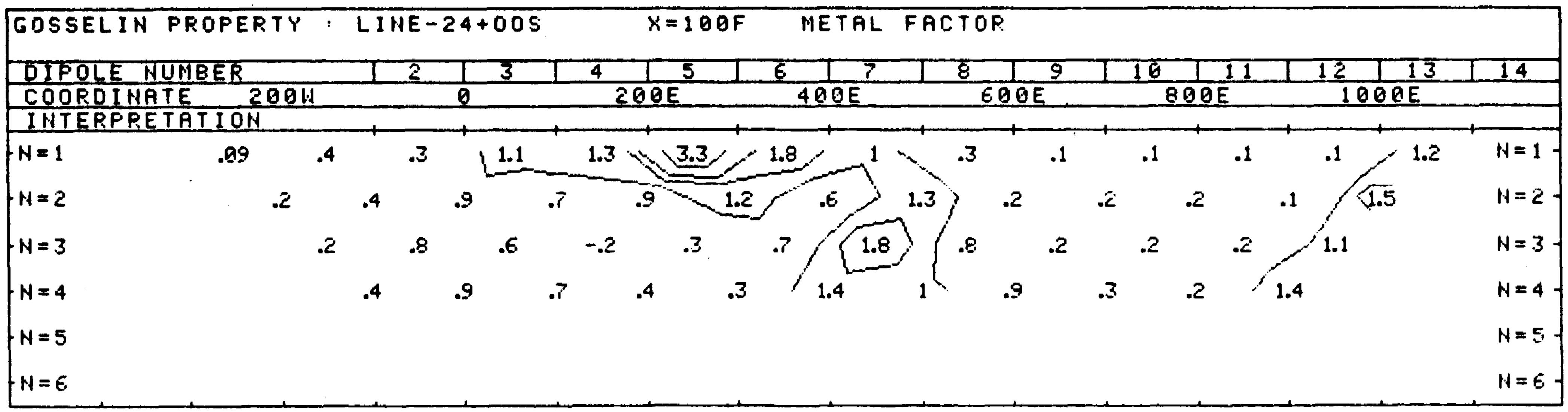
INDUCED POLARIZATION AND RESISTIVITY SURVEY

OM 84-337

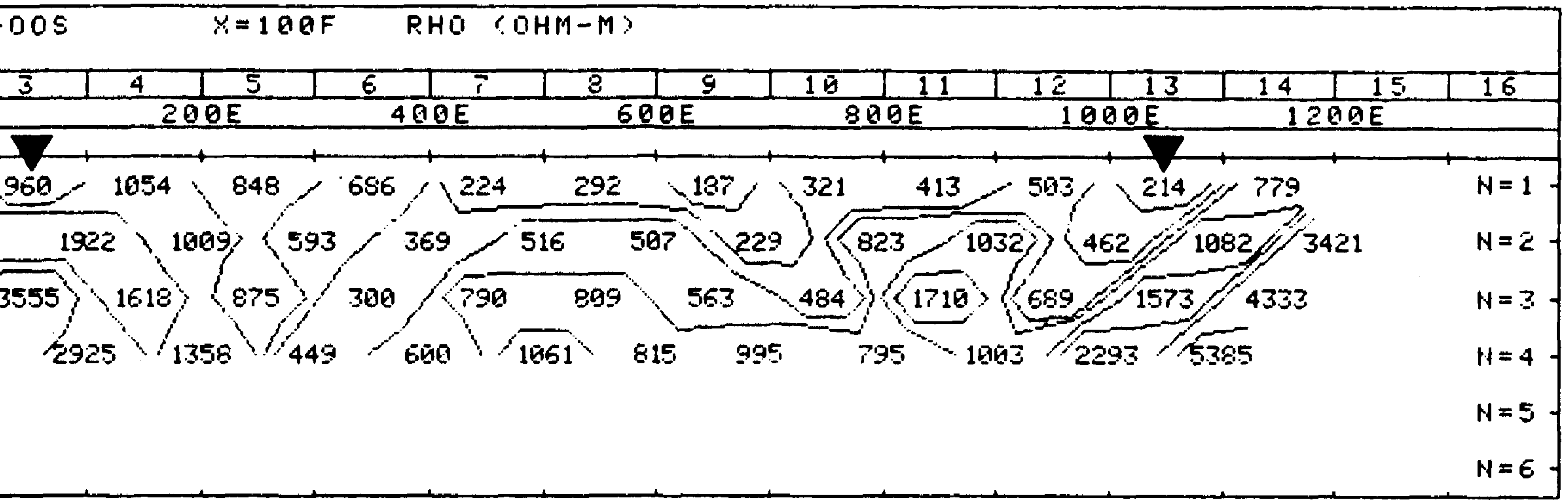
63.4978

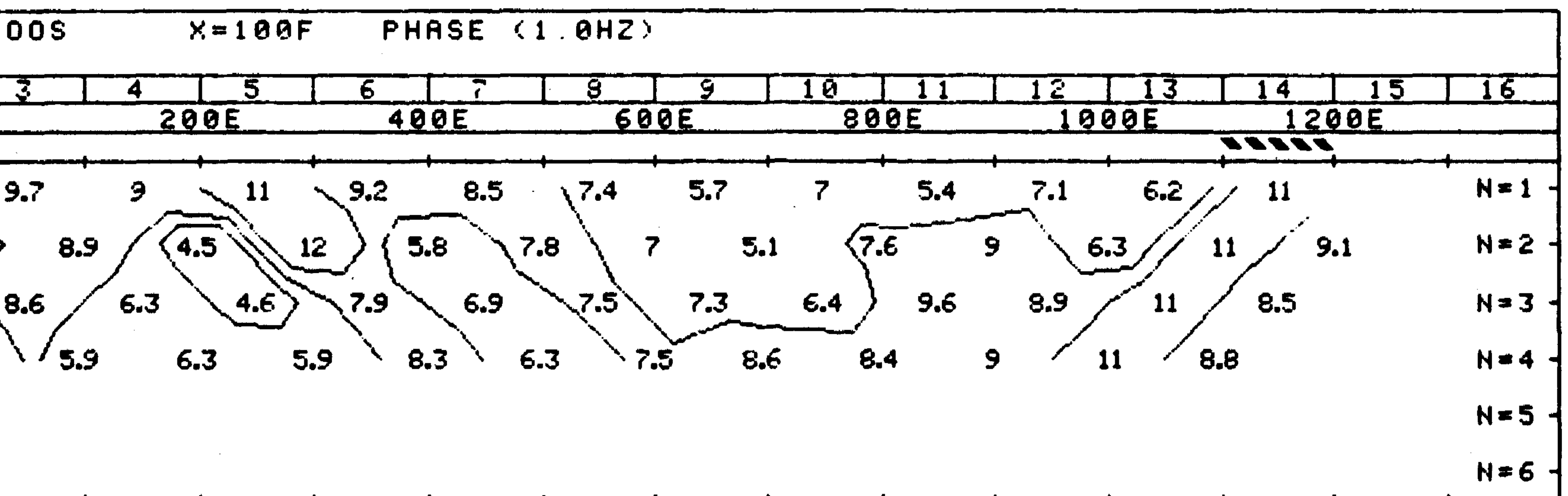

GOSSELIN PROPERTY : LINE-24+00S X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 200W 0 200E 400E 600E 800E 1000E
INTERPRETATION
N=1 3397 4350 3408 945 568 162 494 1621 6078 10K 15K 14K 17K 706 N=1
N=2 11K 4497 795 655 659 828 941 1270 11K 12K 12K 21K 1193 N=2
N=3 10K 1302 623 624 3004 1027 422 1864 11K 13K 15K 1429 N=3
N=4 3046 991 661 3662 3351 698 595 1725 9624 13K 1101 N=4
N=5 N=5
N=6 N=6

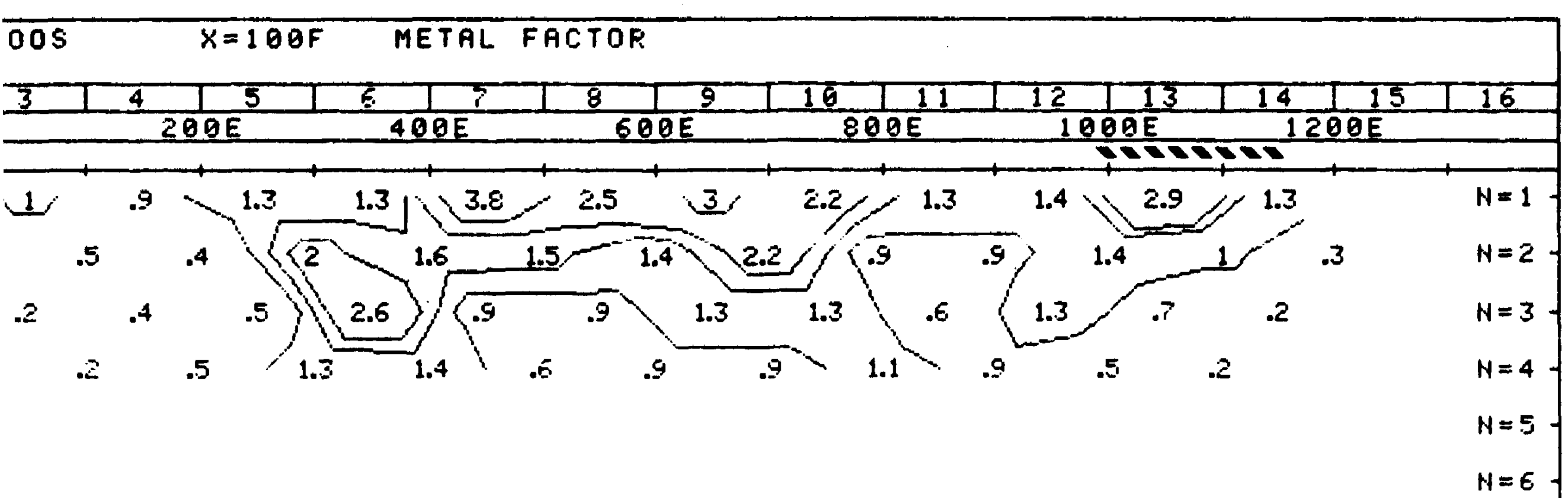

GOSSELIN PROPERTY : LINE-24+00S X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 200W 0 200E 400E 600E 800E 1000E
INTERPRET
N=1 3.2 18 11 11 7.6 5.3 8.7 16 19 11 20 19 20 8.8 N=1
N=2 21 18 6.9 4.8 5.8 10 5.4 16 23 25 20 24 18 N=2
N=3 19 11 3.6 -1.3 10 7.6 7.4 16 25 20 22 16 N=3
N=4 12 8.6 4.5 15 10 9.7 6 16 25 21 16 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY : LINE-24+00S X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 200W 0 200E 400E 600E 800E 1000E
INTERPRETATION
N=1 .09 .4 .3 1.1 1.3 3.3 1.8 1 .3 .1 .1 .1 .1 1.2 N=1
N=2 .2 .4 .9 .7 .9 1.2 .6 1.3 .2 .2 .2 .1 1.5 N=2
N=3 .2 .8 .6 -.2 .3 .7 1.8 .8 .2 .2 .2 1.1 N=3
N=4 .4 .9 .7 .4 .3 1.4 1 .9 .3 .2 1.4 N=4
N=5 N=5
N=6 N=6

DWG. NO.-I.P.-5404-13





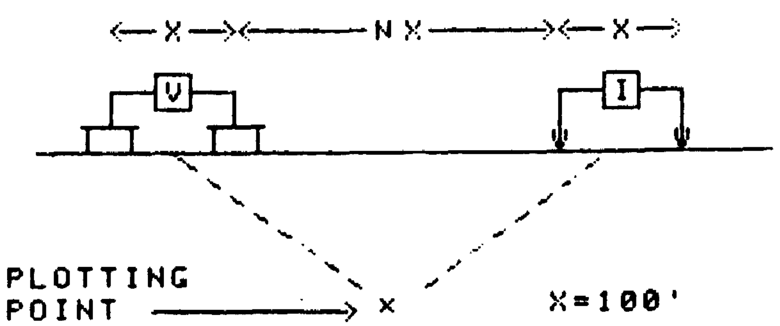


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-20+00S



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

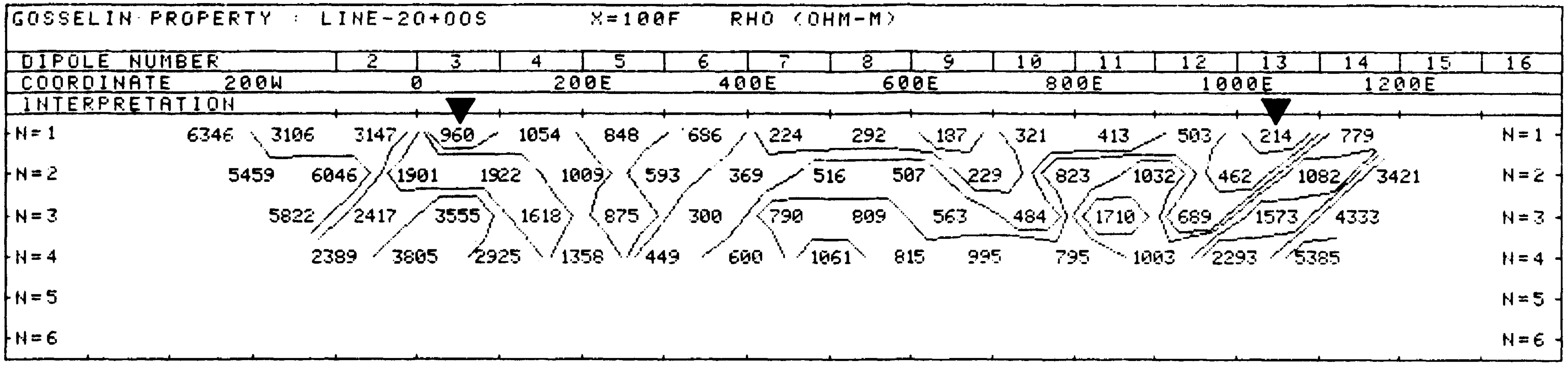
NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

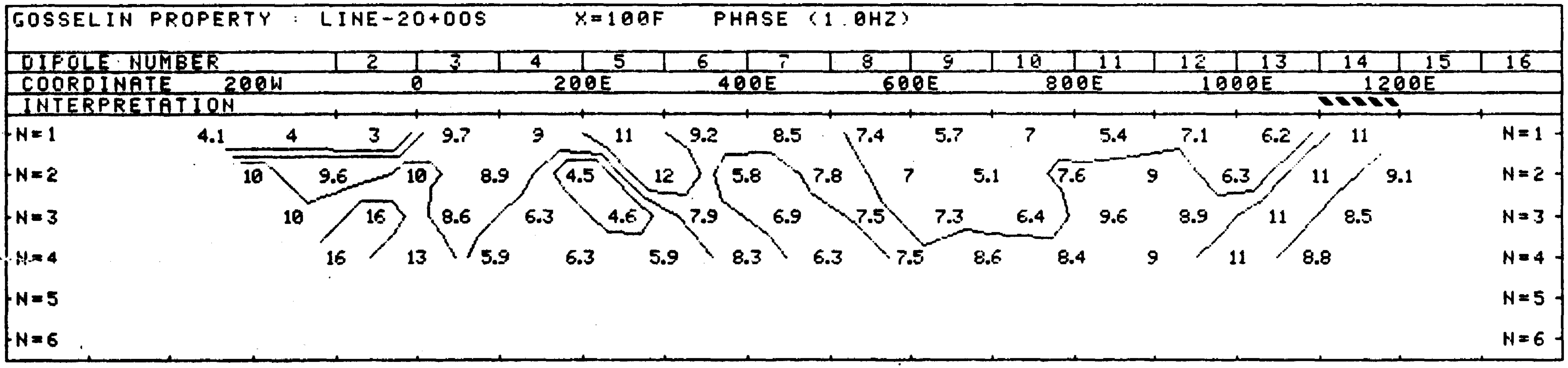
DATE SURVEYED MAY 1985
APPROVED
P. G. HALLOF
DATE 5/7/85

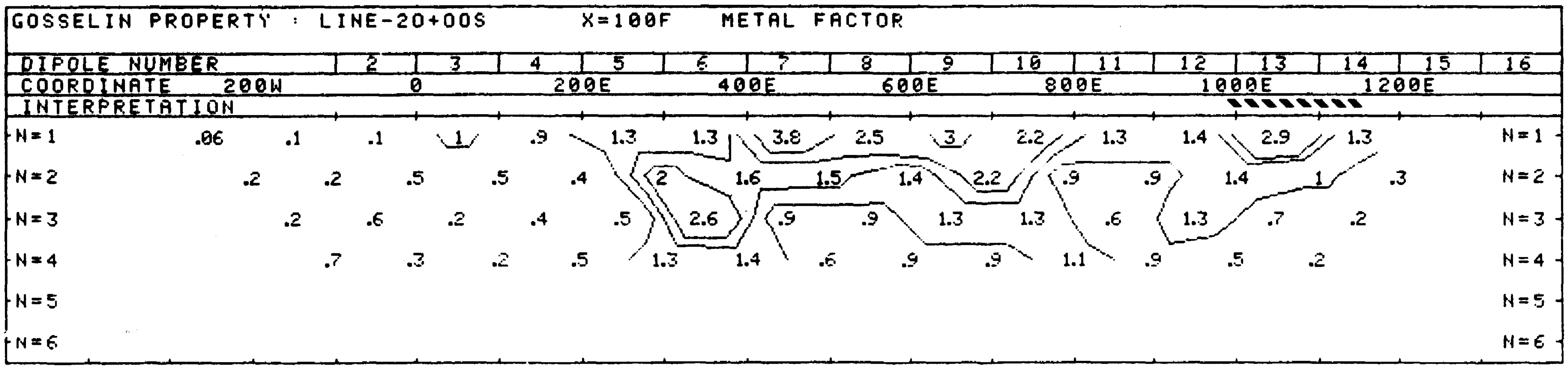
PHOENIX GEOPHYSICS LTD.

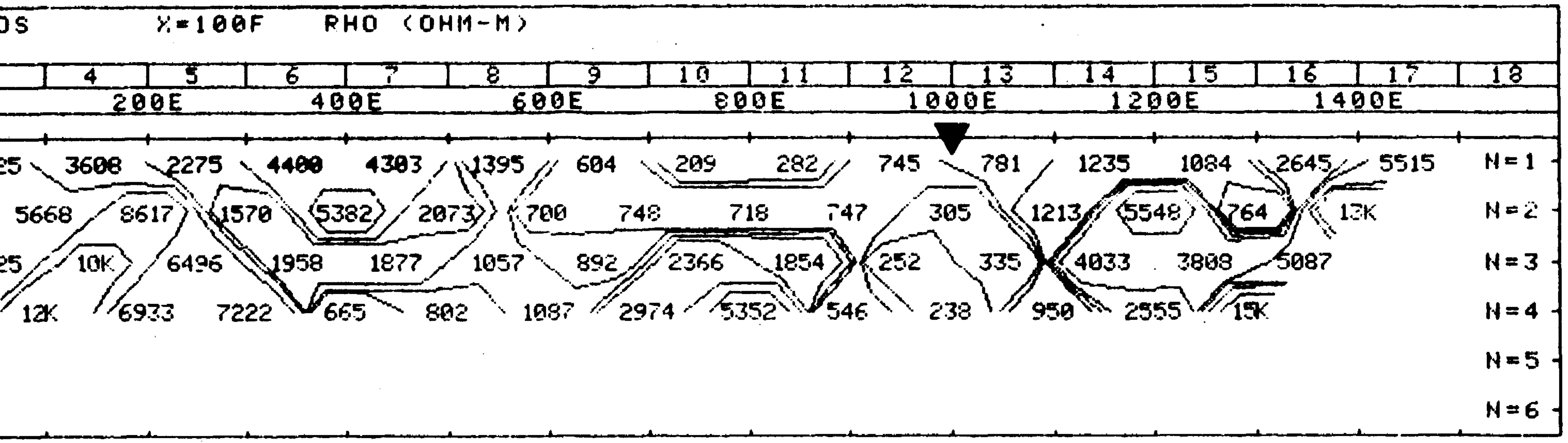
INDUCED POLARIZATION AND RESISTIVITY SURVEY

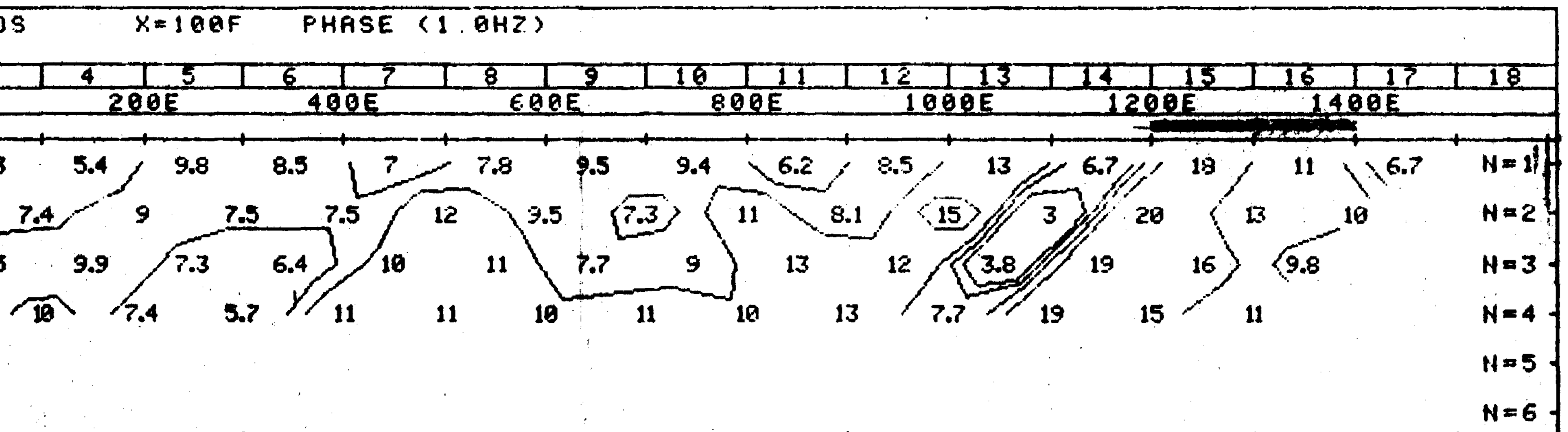
OM 84-357 63.4978

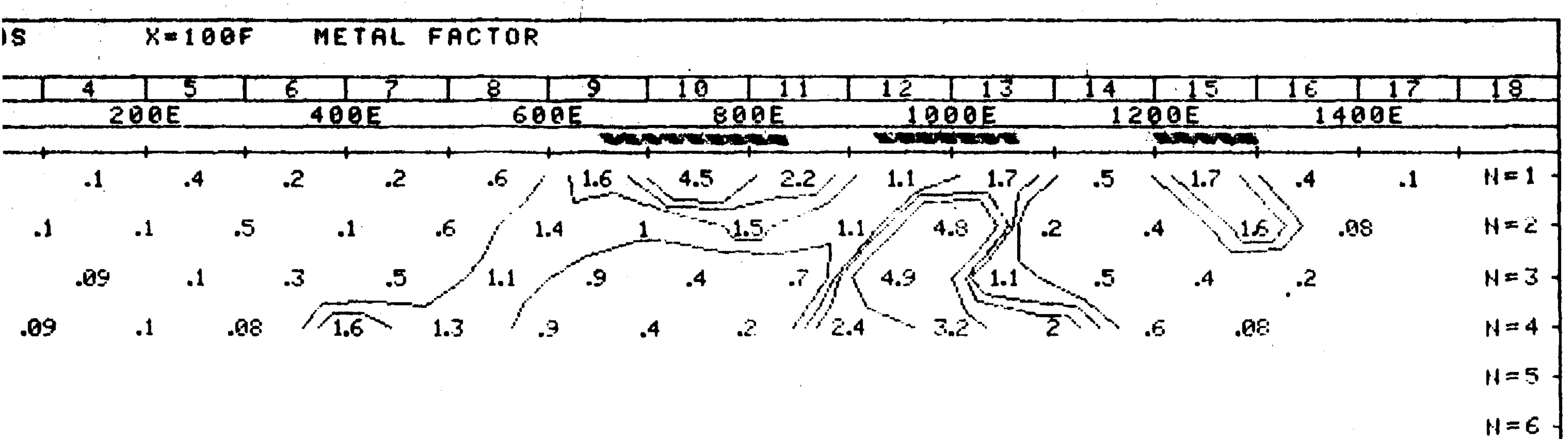

GOSSELIN PROPERTY : LINE-20+00S X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
COORDINATE 200W 0 200E 400E 600E 800E 1000E 1200E
INTERPRETATION
N=1 6346 3106 3147 960 1054 848 686 224 292 187 321 413 503 214 779 N=1
N=2 5459 6046 1901 1922 1009 593 369 516 507 229 823 1032 462 1082 3421 N=2
N=3 5822 2417 3555 1618 875 300 790 809 563 484 1710 689 1573 4333 N=3
N=4 2389 3805 2925 1358 449 600 1061 815 995 795 1003 2293 5385 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY : LINE-20+00S X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
COORDINATE 200W 0 200E 400E 600E 800E 1000E 1200E
INTERPRETATION
N=1 4.1 4 3 9.7 9 11 9.2 8.5 7.4 5.7 7 5.4 7.1 6.2 11 N=1
N=2 10 9.6 10 8.9 4.5 12 5.8 7.8 7 5.1 7.6 9 6.3 11 9.1 N=2
N=3 10 16 8.6 6.3 4.6 7.9 6.9 7.5 7.3 6.4 9.6 8.9 11 8.5 N=3
N=4 16 13 5.9 6.3 5.9 8.3 6.3 7.5 8.6 8.4 9 11 8.8 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY : LINE-20+00S X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
COORDINATE 200W 0 200E 400E 600E 800E 1000E 1200E
INTERPRETATION
N=1 .06 .1 .1 1 .9 1.3 1.3 3.8 2.5 3 2.2 1.3 1.4 2.9 1.3 N=1
N=2 .2 .2 .5 .5 .4 2 1.6 1.5 1.4 2.2 .9 .9 1.4 1 .3 N=2
N=3 .2 .6 .2 .4 .5 2.6 .9 .9 1.3 1.3 .6 1.3 .7 .2 N=3
N=4 .7 .3 .2 .5 1.3 1.4 .6 .9 .9 1.1 .9 .5 .2 N=4
N=5 N=5
N=6 N=6





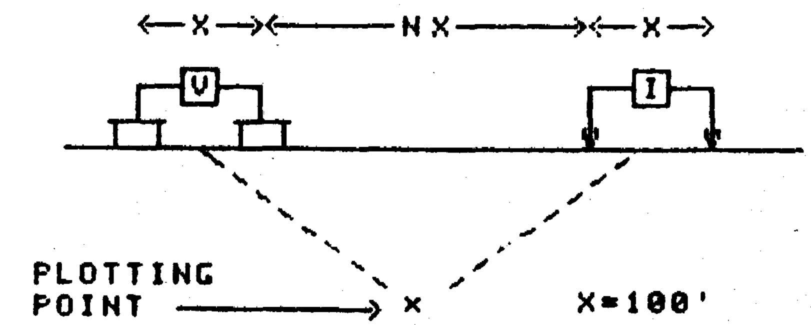


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-16+00S



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

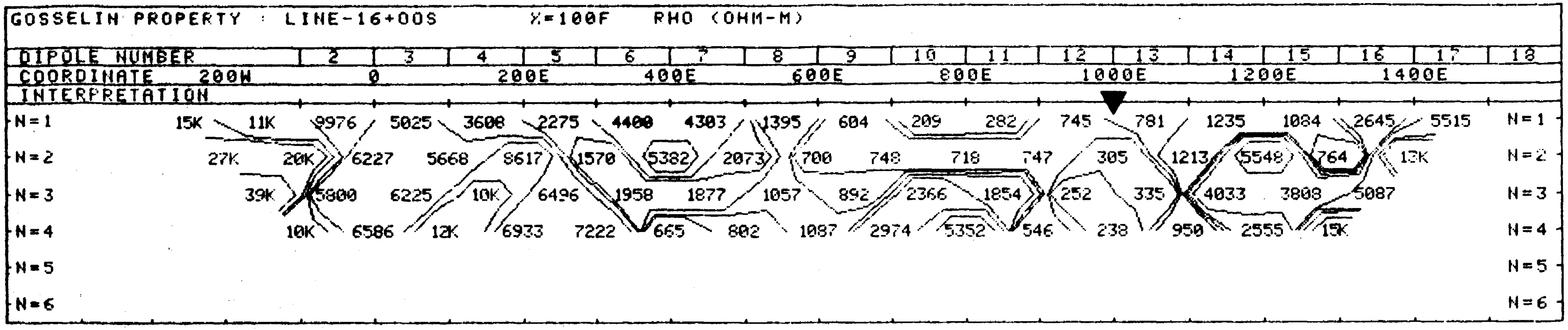
NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

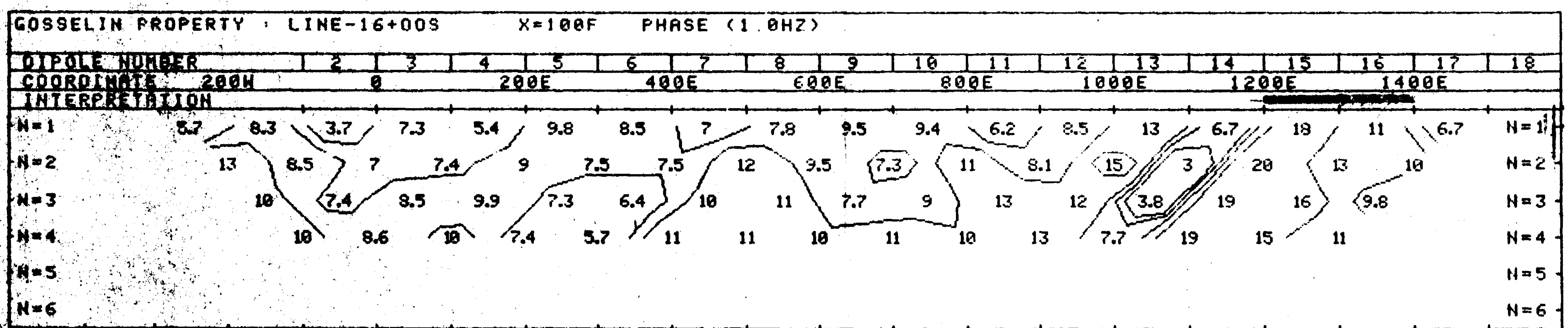
DATE SURVEYED: MAY 1985
APPROVED
P. G. HALLOF
DATE

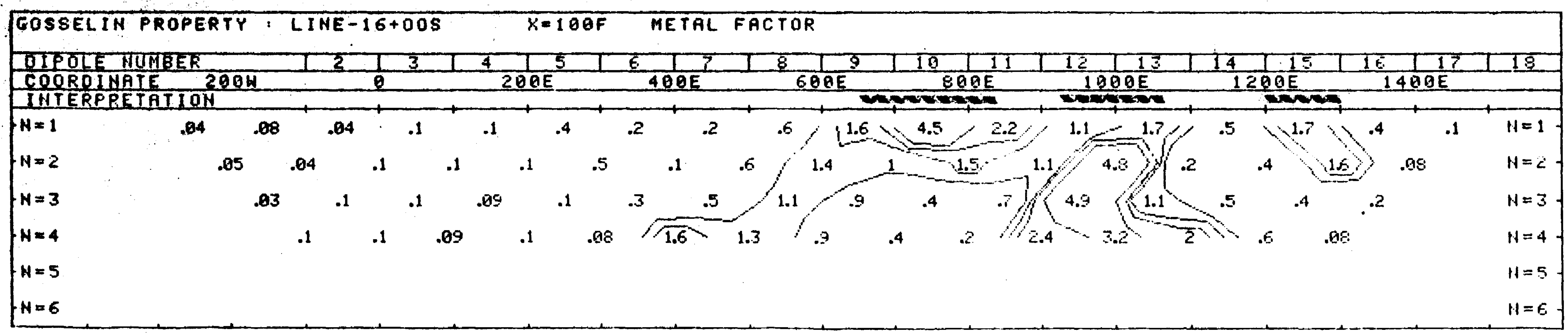
PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

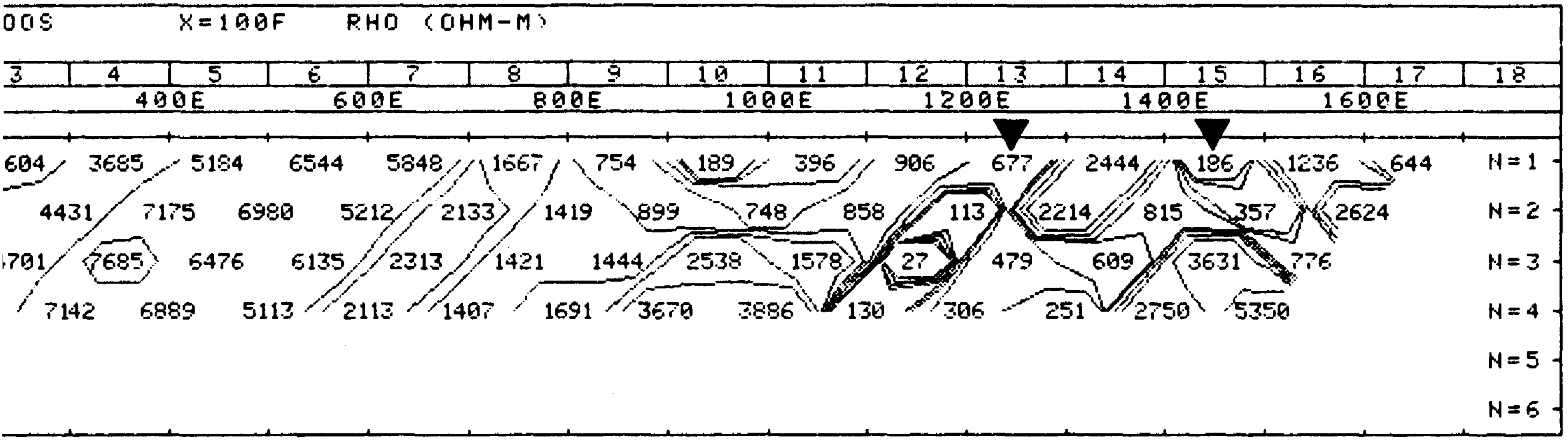
om 84-357 63.4978

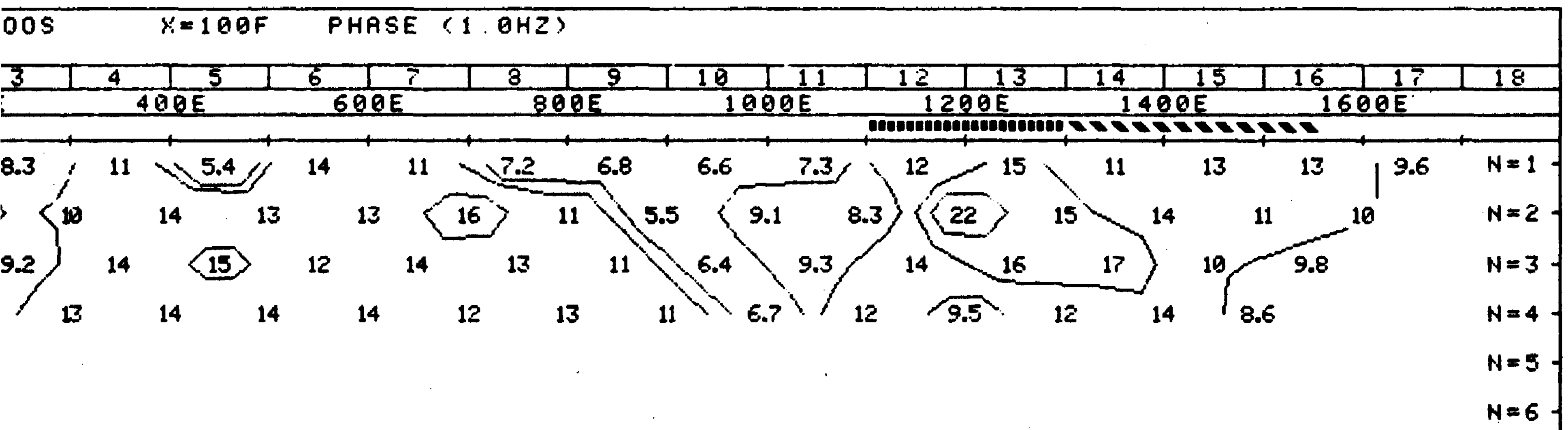

GOSSELIN PROPERTY : LINE-16+00S X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 200W 0 200E 400E 600E 800E 1000E 1200E 1400E
INTERPRETATION
N=1 15K 11K 9976 5025 3608 2275 4400 4303 1395 604 209 282 745 781 1235 1084 2645 5515 N=1
N=2 27K 20K 6227 5668 8617 1570 5382 2073 700 748 718 747 305 1213 5548 764 13K N=2
N=3 39K 5800 6225 10K 6496 1958 1877 1057 892 2366 1854 252 335 4033 3808 5087 N=3
N=4 10K 6586 12K 6933 7222 665 802 1087 2974 5352 546 238 950 2555 15K N=4
N=5 N=5
N=6 N=6

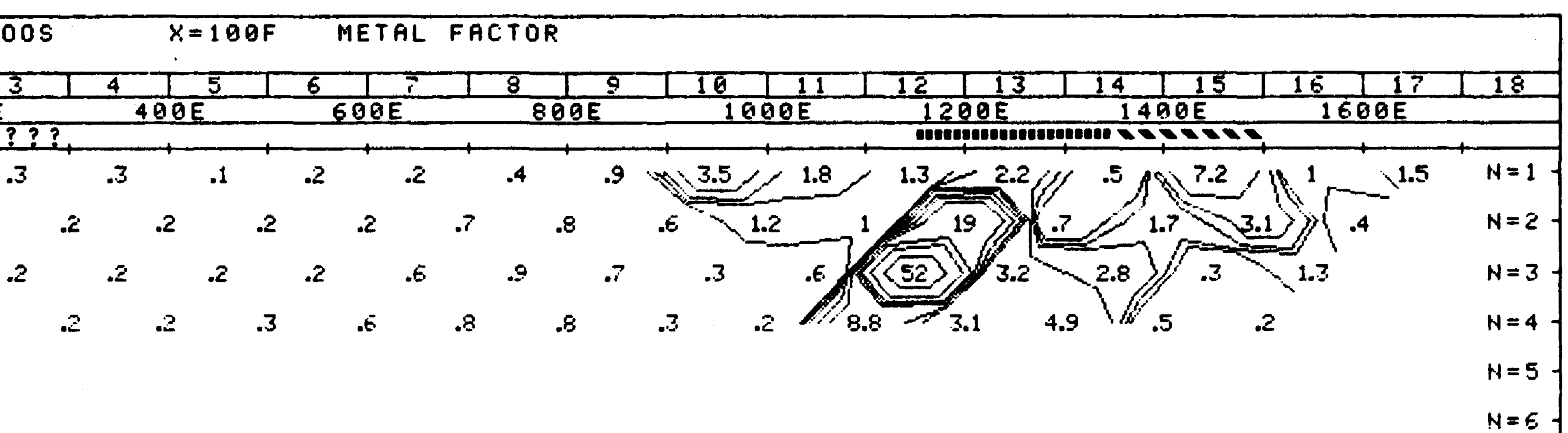

GOSSELIN PROPERTY : LINE-16+00S X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 200W 0 200E 400E 600E 800E 1000E 1200E 1400E
INTERPRETATION
N=1 8.7 8.3 3.7 7.3 5.4 9.8 8.5 7 7.8 9.5 9.4 6.2 8.5 13 6.7 18 11 6.7 N=1
N=2 13 8.5 7 7.4 9 7.5 7.5 12 9.5 7.3 11 8.1 15 3 20 13 10 N=2
N=3 10 7.4 8.5 9.9 7.3 6.4 10 11 7.7 9 13 12 3.8 19 16 9.8 N=3
N=4 10 8.6 10 7.4 5.7 11 11 10 11 10 13 7.7 19 15 11 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY : LINE-16+00S X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 200W 0 200E 400E 600E 800E 1000E 1200E 1400E
INTERPRETATION
N=1 .04 .08 .04 .1 .1 .4 .2 .2 .6 1.6 4.5 2.2 1.1 1.7 .5 1.7 .4 .1 N=1
N=2 .05 .04 .1 .1 .1 .5 .1 .6 1.4 1 1.5 1.1 4.8 .2 .4 1.6 .08 N=2
N=3 .03 .1 .1 .09 .1 .3 .5 1.1 .9 .4 .7 4.9 1.1 .5 .4 .2 N=3
N=4 .1 .1 .09 .1 .08 1.6 1.3 .9 .4 .2 2.4 3.2 2 .6 .08 N=4
N=5 N=5
N=6 N=6

DWG. NO.-I.P.-5404-11





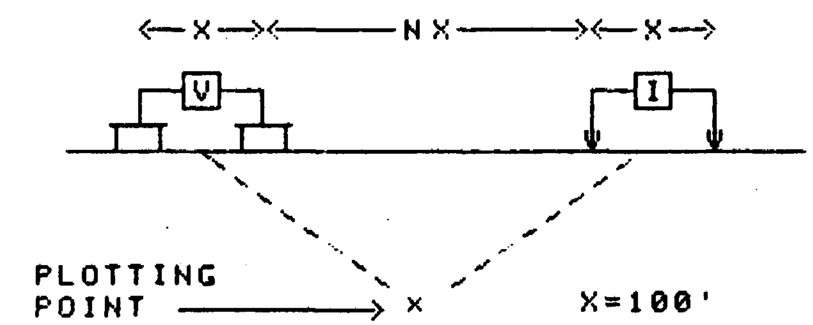


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-12+00S



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

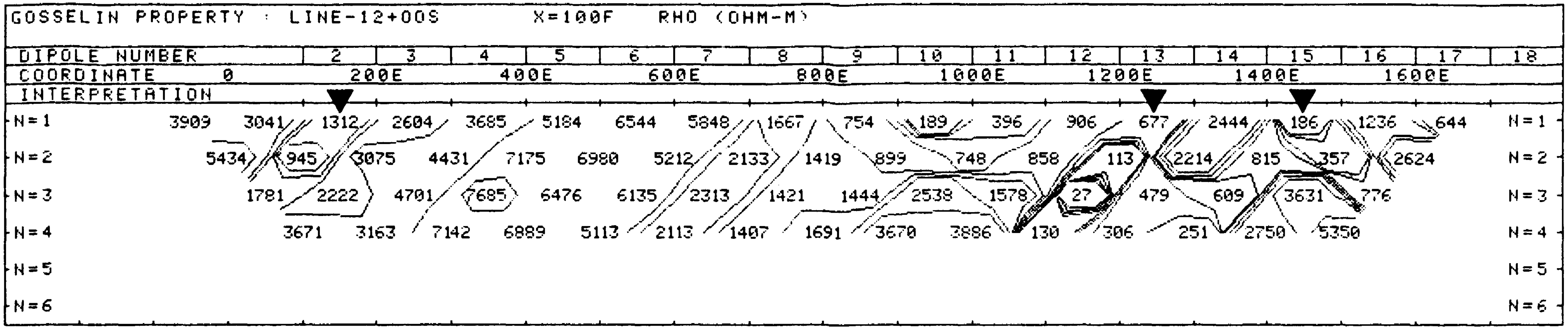
NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

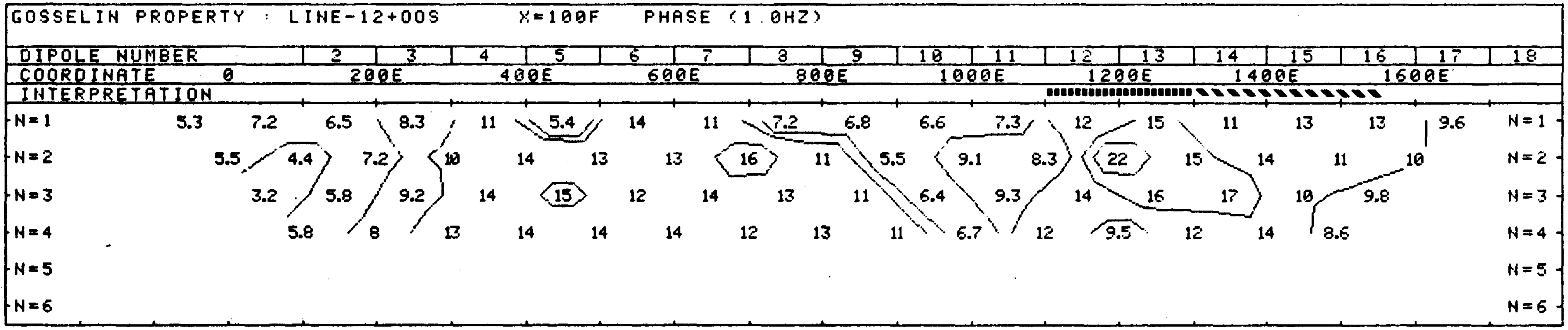
DATE SURVEYED: MAY 1985
APPROVED: Philip G. Hallof
P. G. HALLOF
DATE

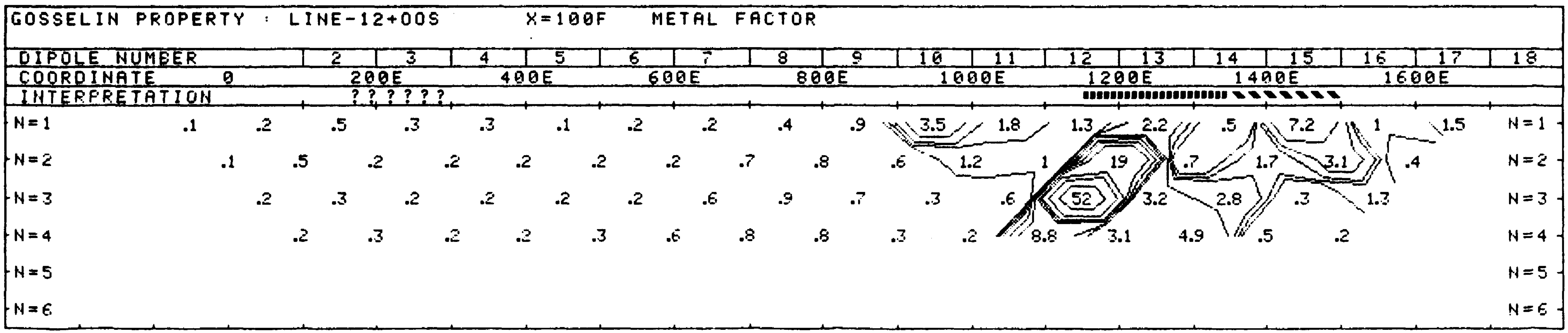
PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

0M84-378 63.4978


GOSSELIN PROPERTY : LINE-12+00S X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 0 200E 400E 600E 800E 1000E 1200E 1400E 1600E
INTERPRETATION
N=1 3909 3041 1312 2604 3685 5184 6544 5848 1667 754 189 396 906 677 2444 186 1236 644 N=1
N=2 5434 945 3075 4431 7175 6980 5212 2133 1419 899 748 858 113 2214 815 357 2624 N=2
N=3 1781 2222 4701 7685 6476 6135 2313 1421 1444 2538 1578 27 479 609 3631 776 N=3
N=4 3671 3163 7142 6889 5113 2113 1407 1691 3670 3886 130 306 251 2750 5350 N=4
N=5 N=5
N=6 N=6

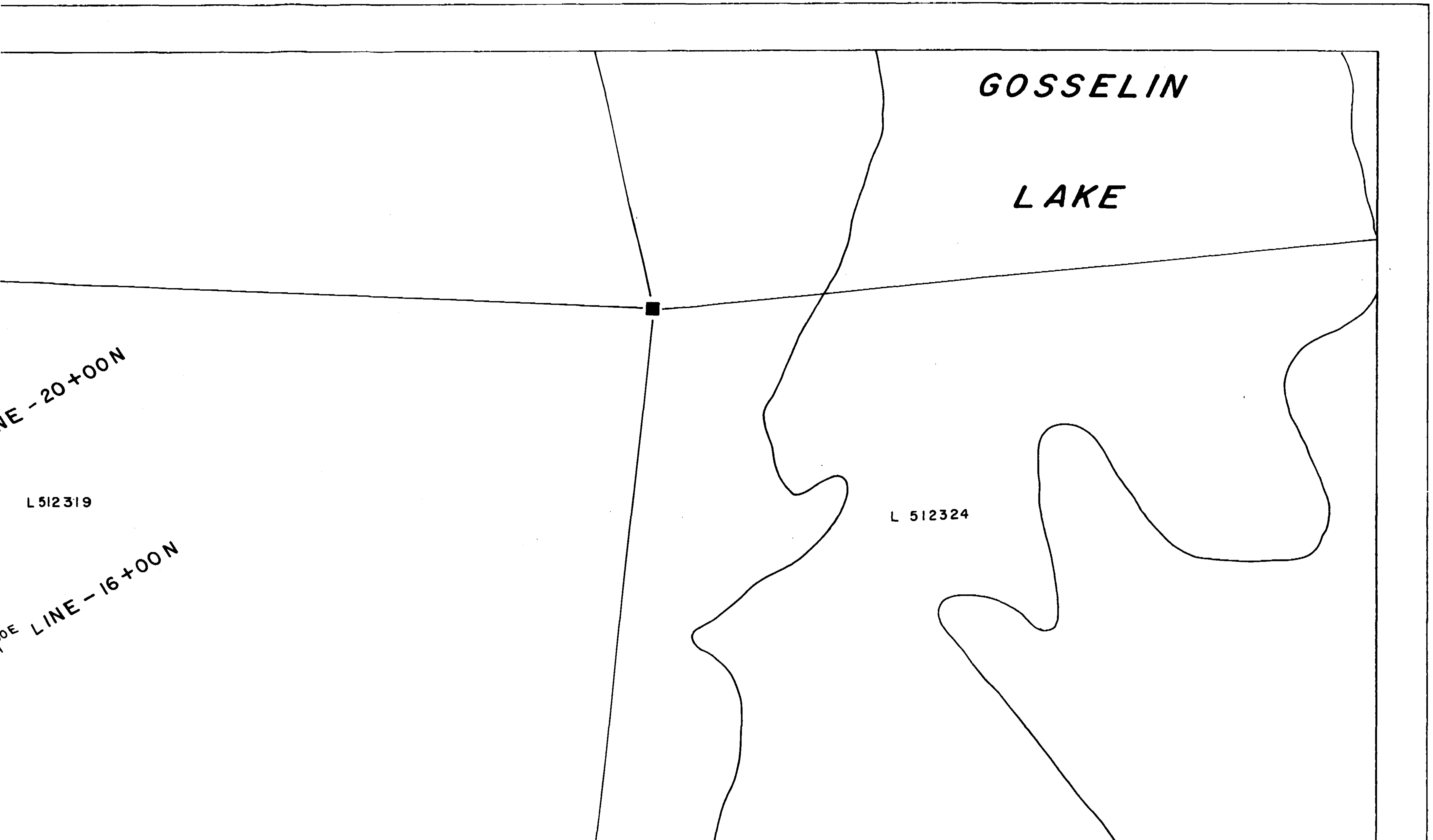

GOSSELIN PROPERTY : LINE-12+00S X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 0 200E 400E 600E 800E 1000E 1200E 1400E 1600E
INTERPRETATION
N=1 5.3 7.2 6.5 8.3 11 5.4 14 11 7.2 6.8 6.6 7.3 12 15 11 13 13 9.6 N=1
N=2 5.5 4.4 7.2 10 14 13 13 16 11 5.5 9.1 8.3 22 15 14 11 10 N=2
N=3 3.2 5.8 9.2 14 15 12 14 13 11 6.4 9.3 14 16 17 10 9.8 N=3
N=4 5.8 8 13 14 14 14 12 13 11 6.7 12 9.5 12 14 8.6 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY : LINE-12+00S X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 0 200E 400E 600E 800E 1000E 1200E 1400E 1600E
INTERPRETATION ??????
N=1 .1 .2 .5 .3 .3 .1 .2 .2 .4 .9 3.5 1.8 1.3 2.2 .5 7.2 1 1.5 N=1
N=2 .1 .5 .2 .2 .2 .2 .2 .7 .8 .6 1.2 1 19 .7 1.7 3.1 .4 N=2
N=3 .2 .3 .2 .2 .2 .2 .6 .9 .7 .3 .6 52 3.2 2.8 .3 1.3 N=3
N=4 .2 .3 .2 .2 .3 .6 .8 .8 .3 .2 8.8 3.1 4.9 .5 .2 N=4
N=5 N=5
N=6 N=6

YSICS LIMITED

ND RESISTIVITY SURVEY

MAP

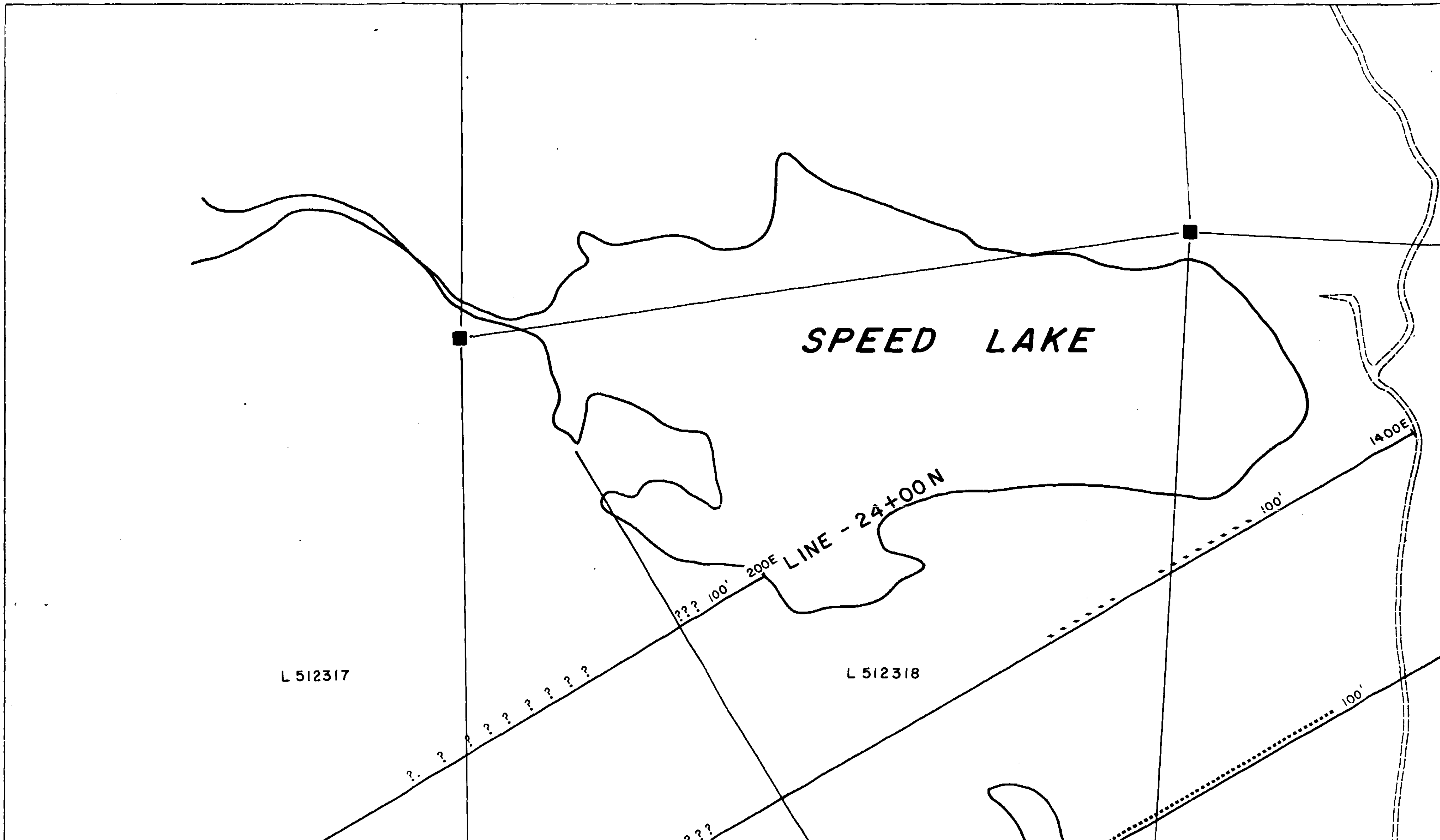


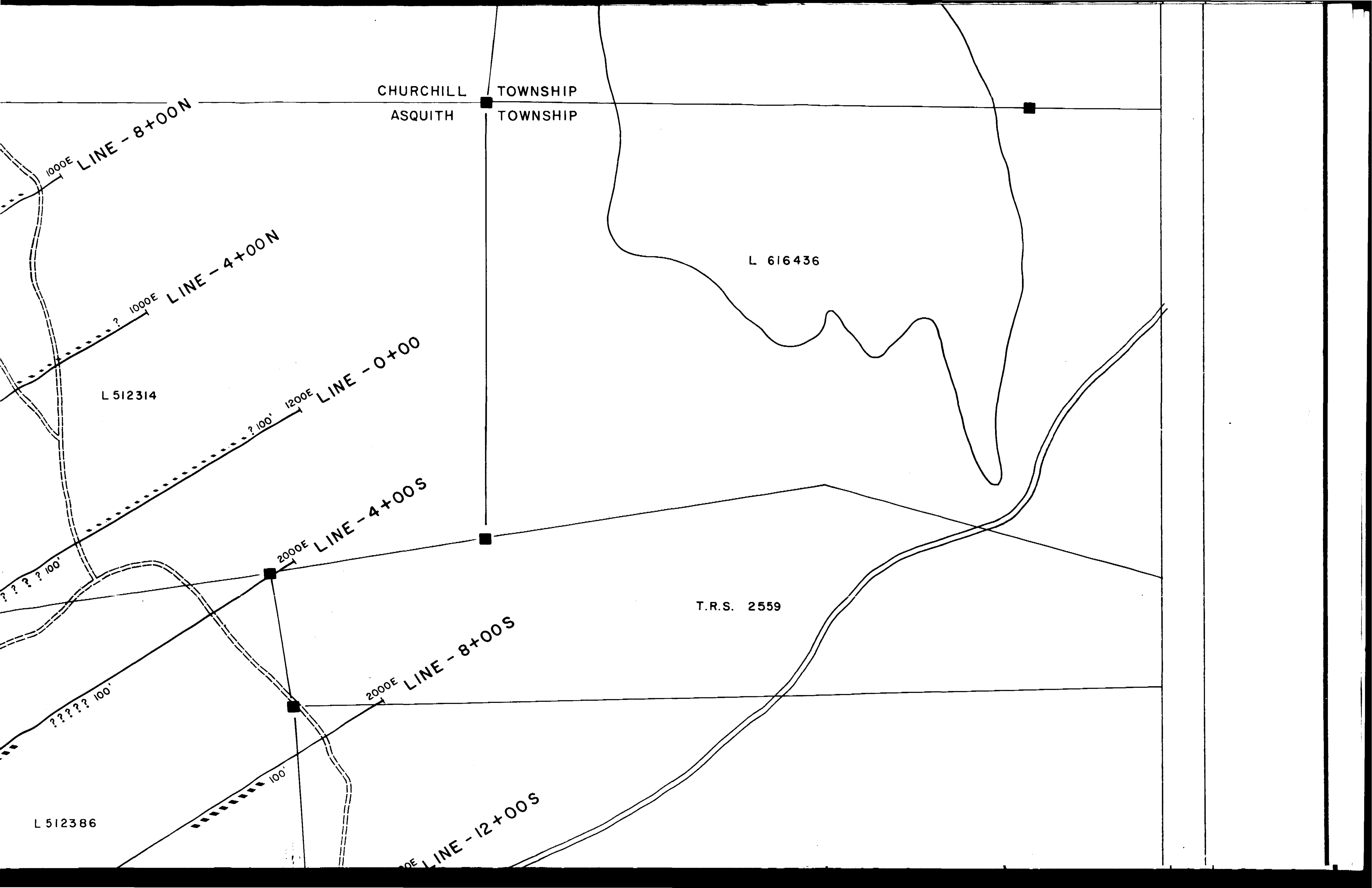
DWG. NO. - I.P.P. - 4139

PHOENIX GEOP

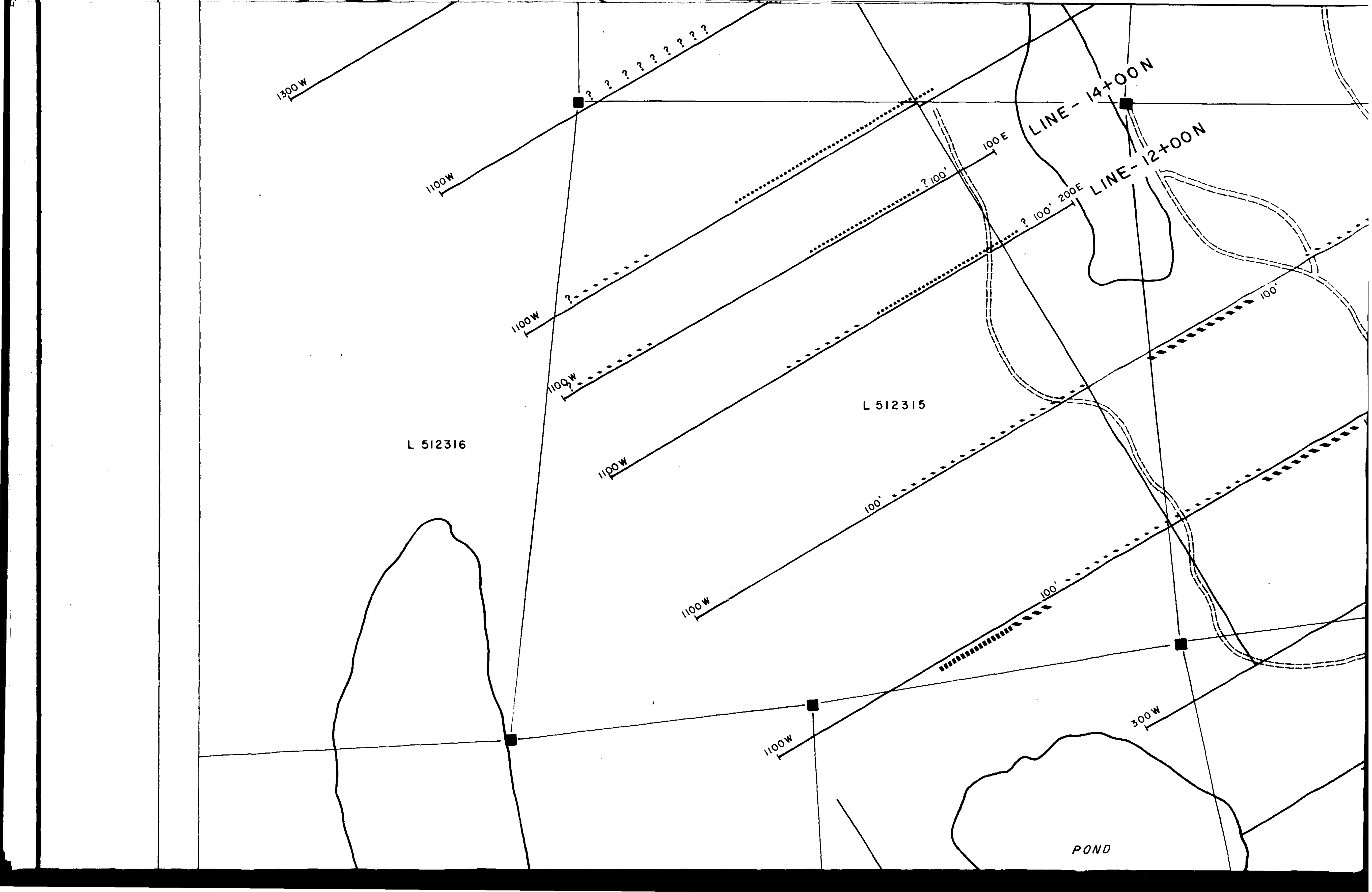
INDUCED POLARIZATION

PLA

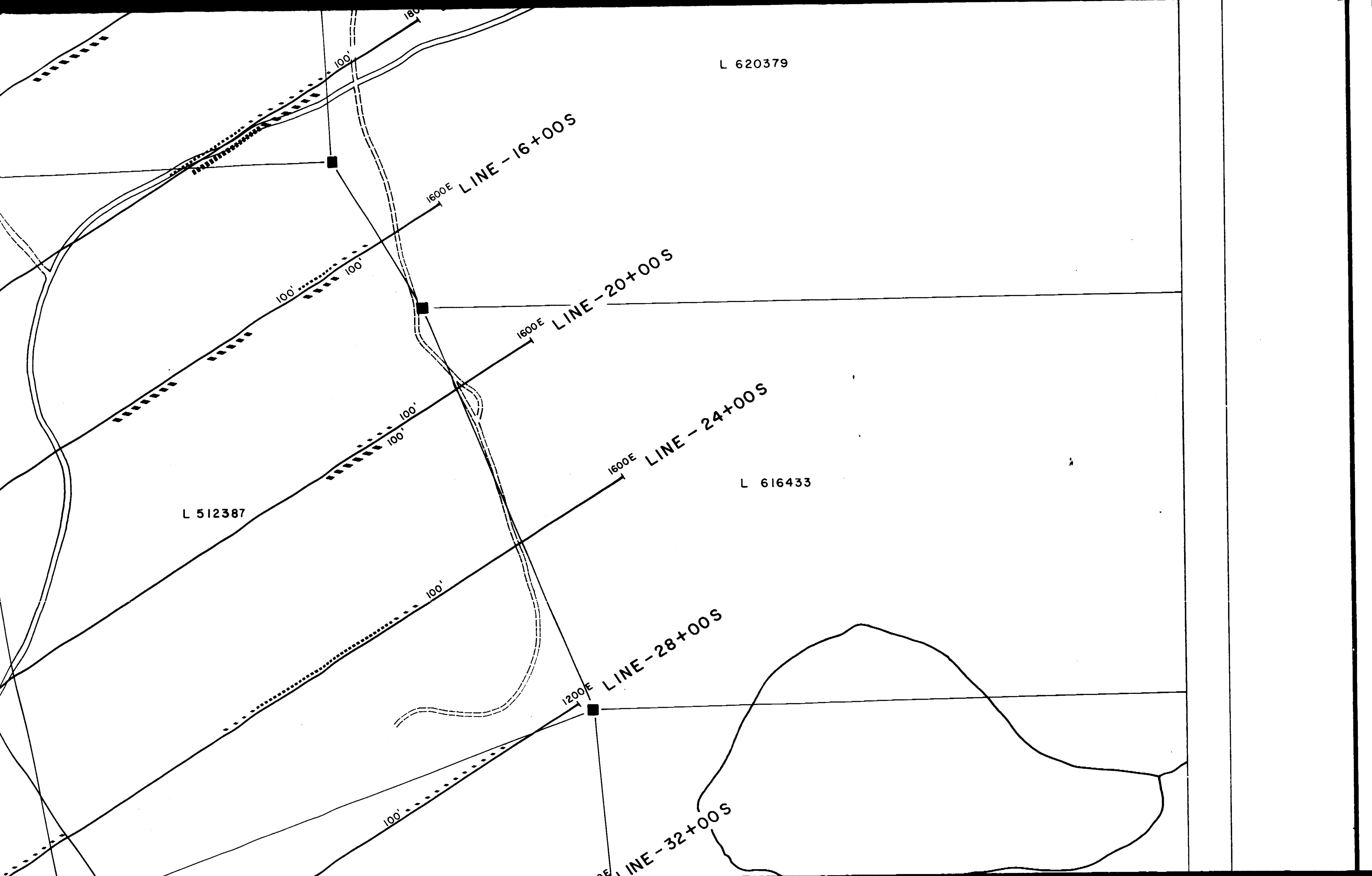




CHURCHILL TOWNSHIP
ASQUITH TOWNSHIP
LINE - 8+00N
1000E
LINE - 4+00N
1000E
LINE - 0+00
1200E
100'
LINE - 4+00S
2000E
100'
LINE - 8+00S
2000E
100'
100'
LINE - 12+00S
L 512314
L 616436
T.R.S. 2559
L 512386

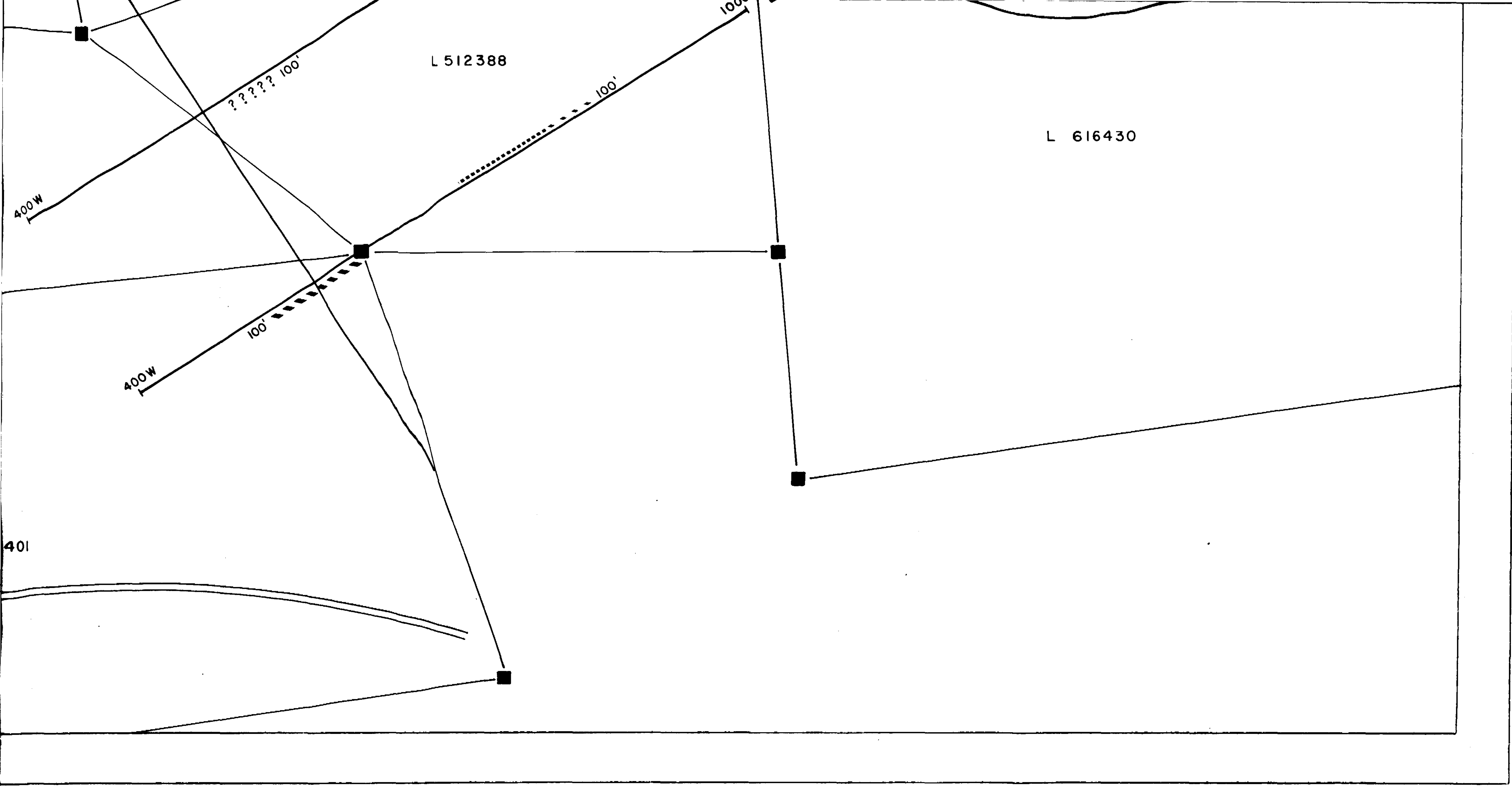


LINE- 14+00N
LINE- 12+00N
1300 W
1100 W
100 E
200 E
100'
300 W
L 512316
L 512315
POND



L 620379
LINE - 16+00S
1600E
100'
LINE - 20+00S
1600E
LINE - 24+00S
1600E
L 616433
L 512387
LINE - 28+00S
1200E
LINE - 32+00S

L 531398
L 571502
L 571503
L 531399
200W
100' ? ? ? ? ?
NORA LAKE
400 W
400 W



SOURCES INC.

CHURCHILL & ASQUITH TWP.

DISTRICT , ONTARIO

CALE

200' 400' 600'

h = 200 feet

DRAWN: R.C.N.

DATE: JULY 1985

APPROVED: P. G. HALLOF

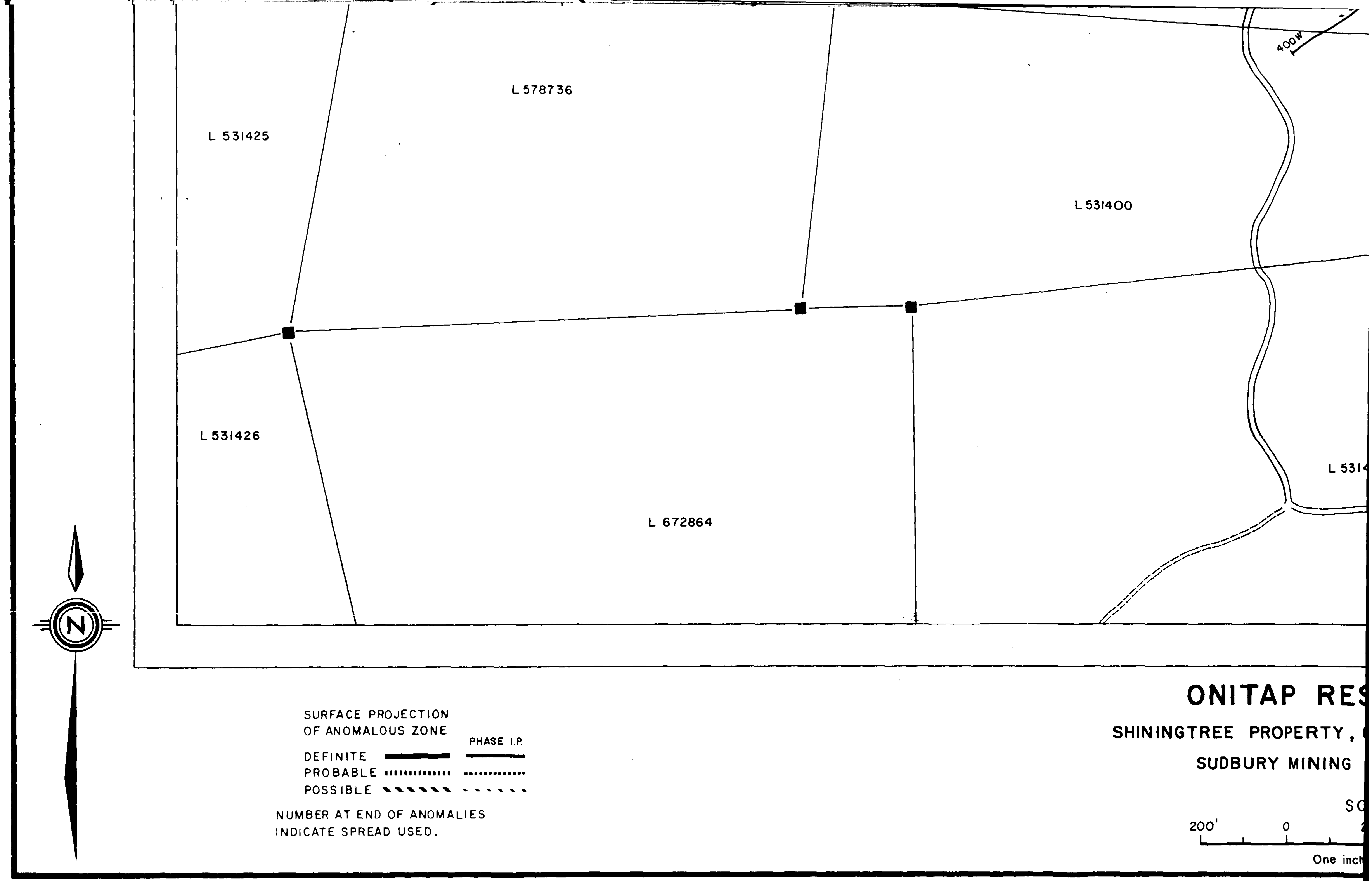
DATE:

REGISTERED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO

OM84-357

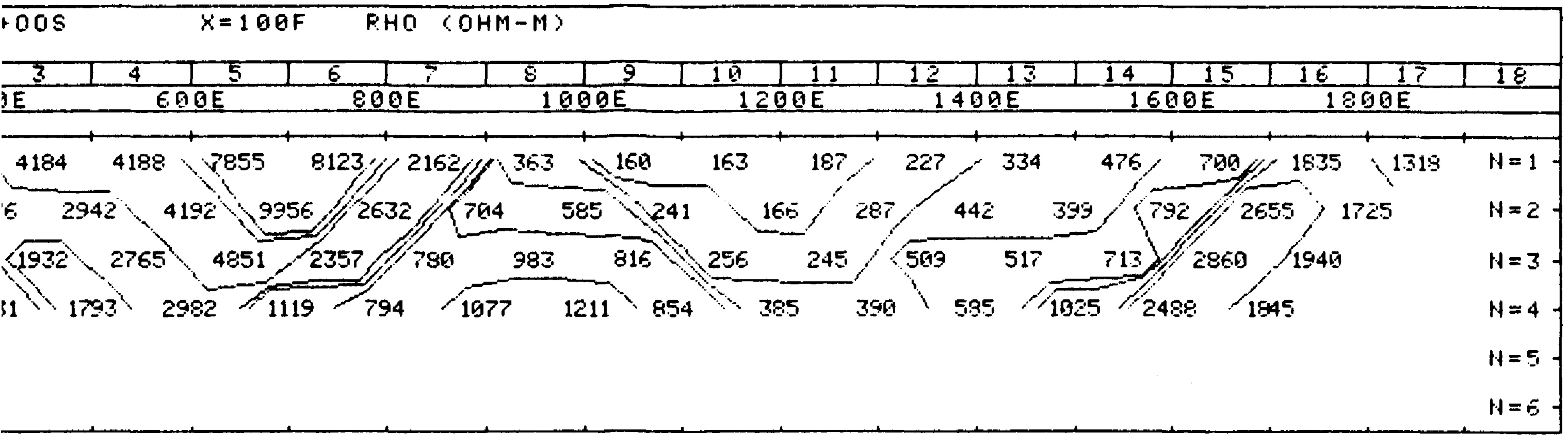
63-4978

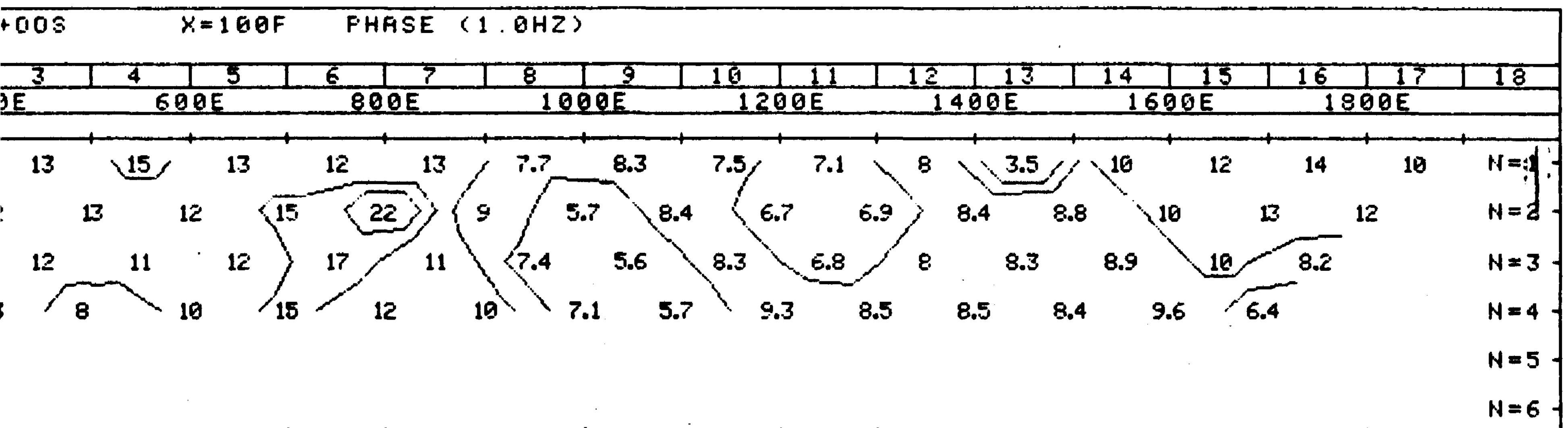
DWG. NO.- I.P.P. - 4139

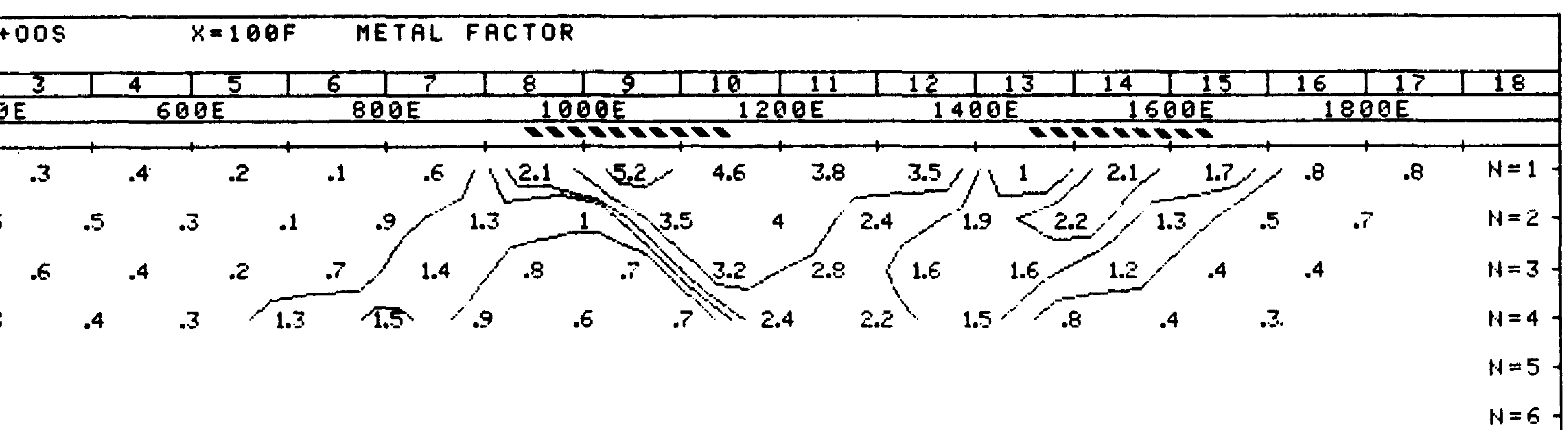


400W
L 578736
L 531425
L 531400
L 531426
L 672864
L 5314
ONITAP RES
SHININGTREE PROPERTY,
SUDBURY MINING
SURFACE PROJECTION
OF ANOMALOUS ZONE
PHASE I.P.
DEFINITE
PROBABLE
POSSIBLE
NUMBER AT END OF ANOMALIES
INDICATE SPREAD USED.
SC
200'
0
One inch

DWG. NO.-I.P.-5404-10





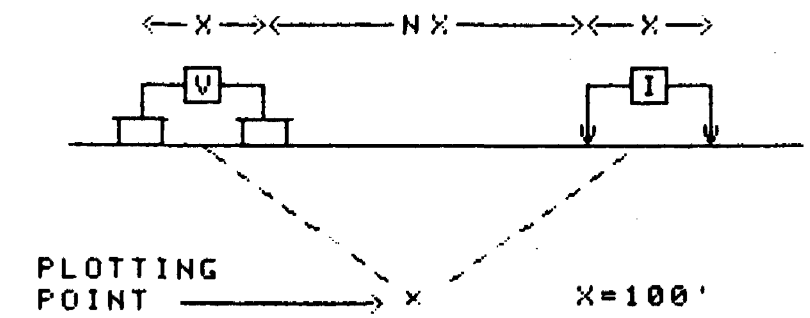


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-8+00S



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

DATE SURVEYED: MAY 1985

APPROVED

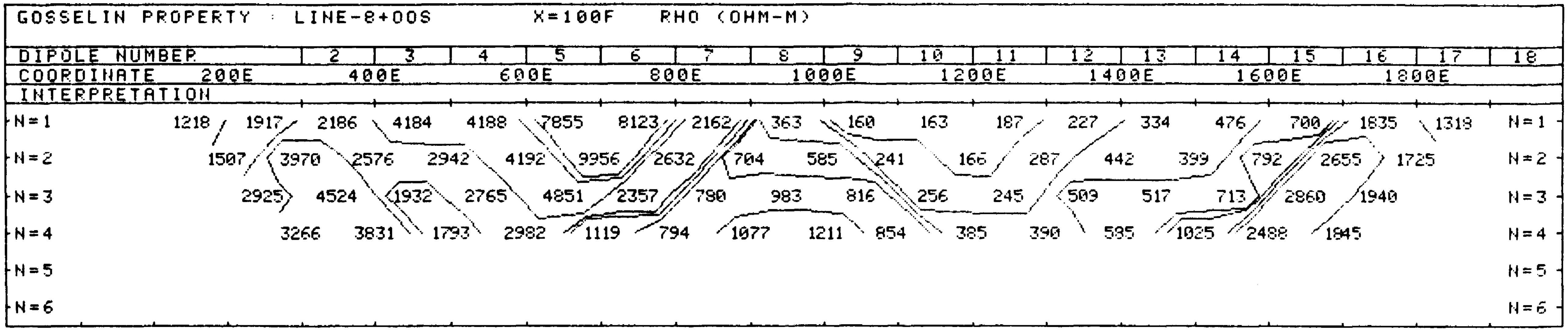
P. G. HALLOF

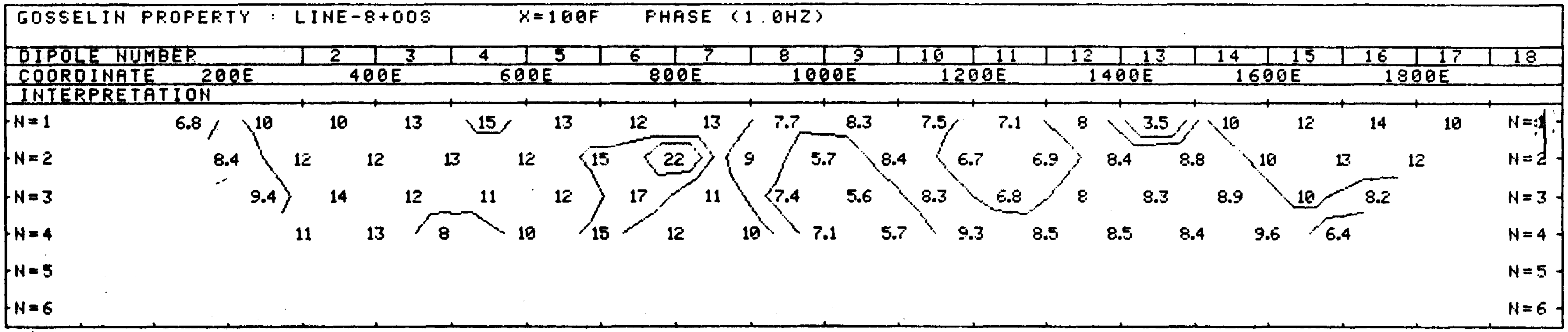
DATE

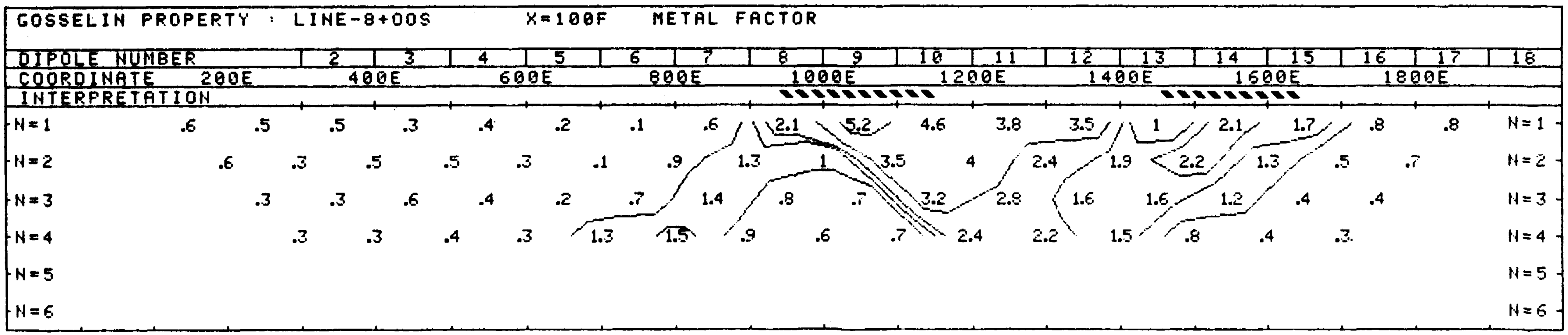
PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

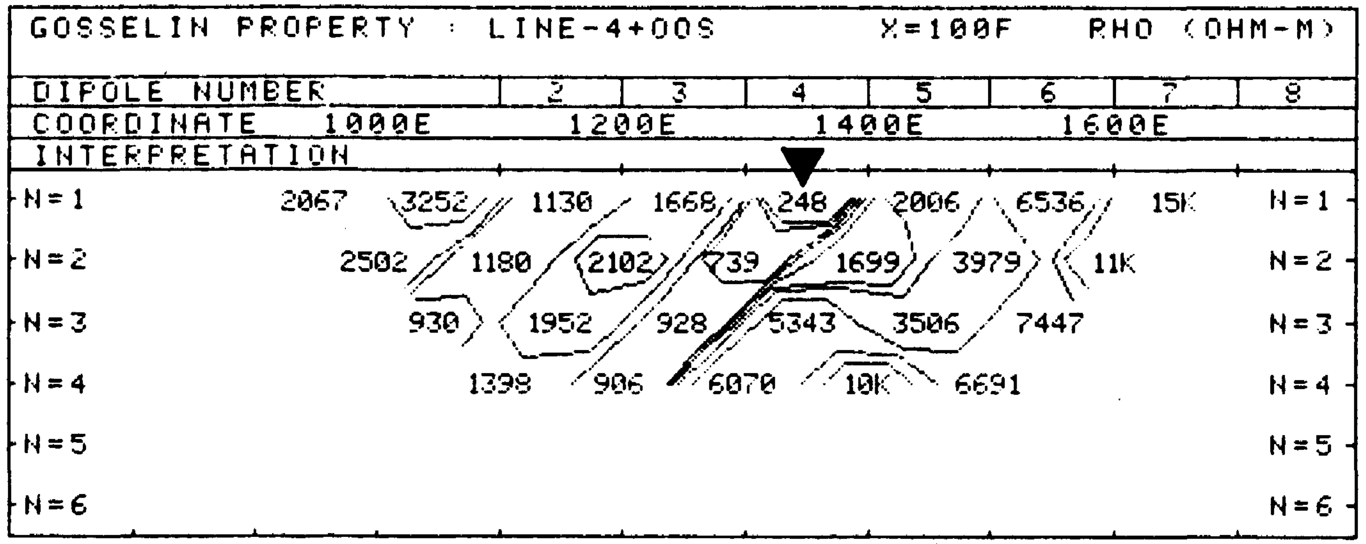
om 84-357 63.4978

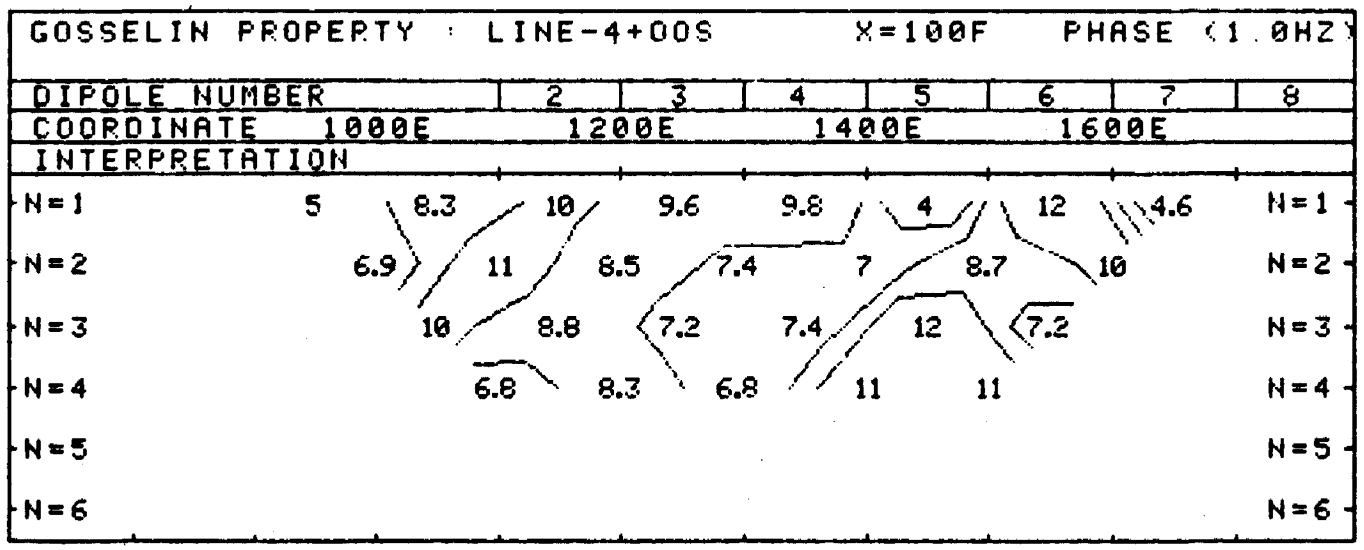

GOSSELIN PROPERTY : LINE-8+00S X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 200E 400E 600E 800E 1000E 1200E 1400E 1600E 1800E
INTERPRETATION
N=1 1218 1917 2186 4184 4188 7855 8123 2162 363 160 163 187 227 334 476 700 1835 1318 N=1
N=2 1507 3970 2576 2942 4192 9956 2632 704 585 241 166 287 442 399 792 2655 1725 N=2
N=3 2925 4524 1932 2765 4851 2357 780 983 816 256 245 509 517 713 2860 1940 N=3
N=4 3266 3831 1793 2982 1119 794 1077 1211 854 385 390 595 1025 2488 1845 N=4
N=5 N=5
N=6 N=6

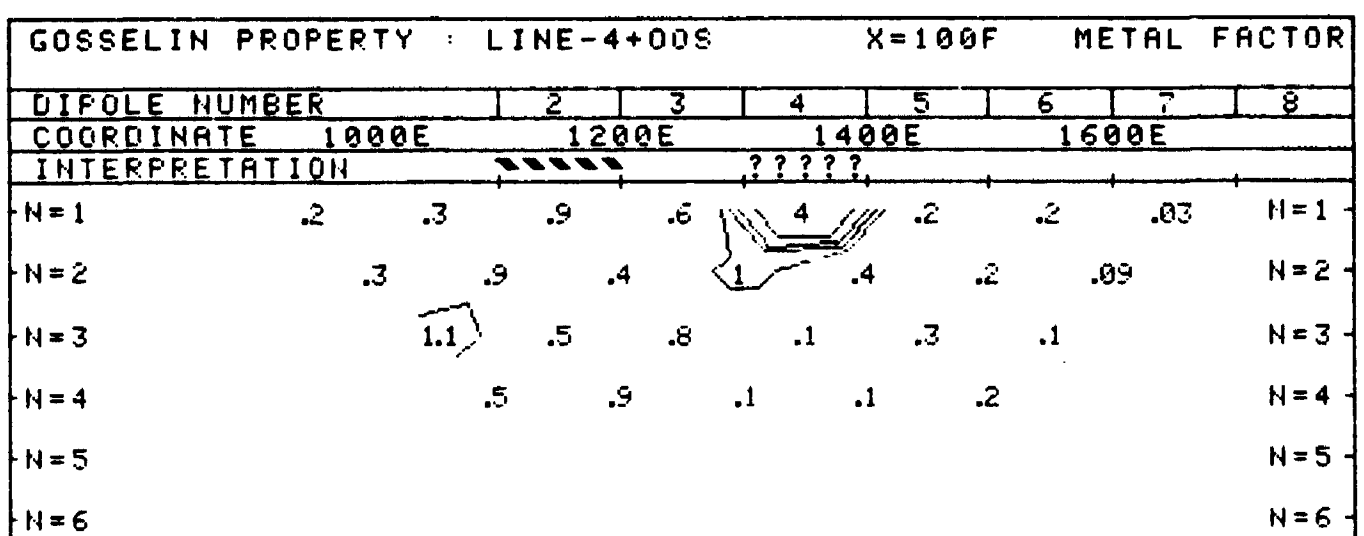

GOSSELIN PROPERTY : LINE-8+00S X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 200E 400E 600E 800E 1000E 1200E 1400E 1600E 1800E
INTERPRETATION
N=1 6.8 10 10 13 15 13 12 13 7.7 8.3 7.5 7.1 8 3.5 10 12 14 10 N=1
N=2 8.4 12 12 13 12 15 22 9 5.7 8.4 6.7 6.9 8.4 8.8 10 13 12 N=2
N=3 9.4 14 12 11 12 17 11 7.4 5.6 8.3 6.8 8 8.3 8.9 10 8.2 N=3
N=4 11 13 8 10 15 12 10 7.1 5.7 9.3 8.5 8.5 8.4 9.6 6.4 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY : LINE-8+00S X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
COORDINATE 200E 400E 600E 800E 1000E 1200E 1400E 1600E 1800E
INTERPRETATION
N=1 .6 .5 .5 .3 .4 .2 .1 .6 2.1 5.2 4.6 3.8 3.5 1 2.1 1.7 .8 .8 N=1
N=2 .6 .3 .5 .5 .3 .1 .9 1.3 1 3.5 4 2.4 1.9 2.2 1.3 .5 .7 N=2
N=3 .3 .3 .6 .4 .2 .7 1.4 .8 .7 3.2 2.8 1.6 1.6 1.2 .4 .4 N=3
N=4 .3 .3 .4 .3 1.3 1.5 .9 .6 .7 2.4 2.2 1.5 .8 .4 .3 N=4
N=5 N=5
N=6 N=6

DWG. NO.-I.P.-5404-9





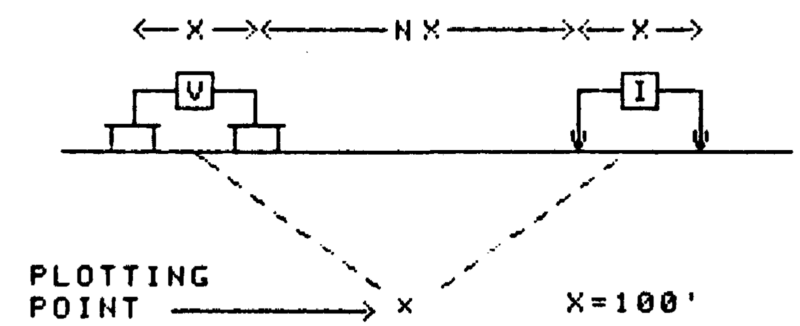


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-4+00S



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

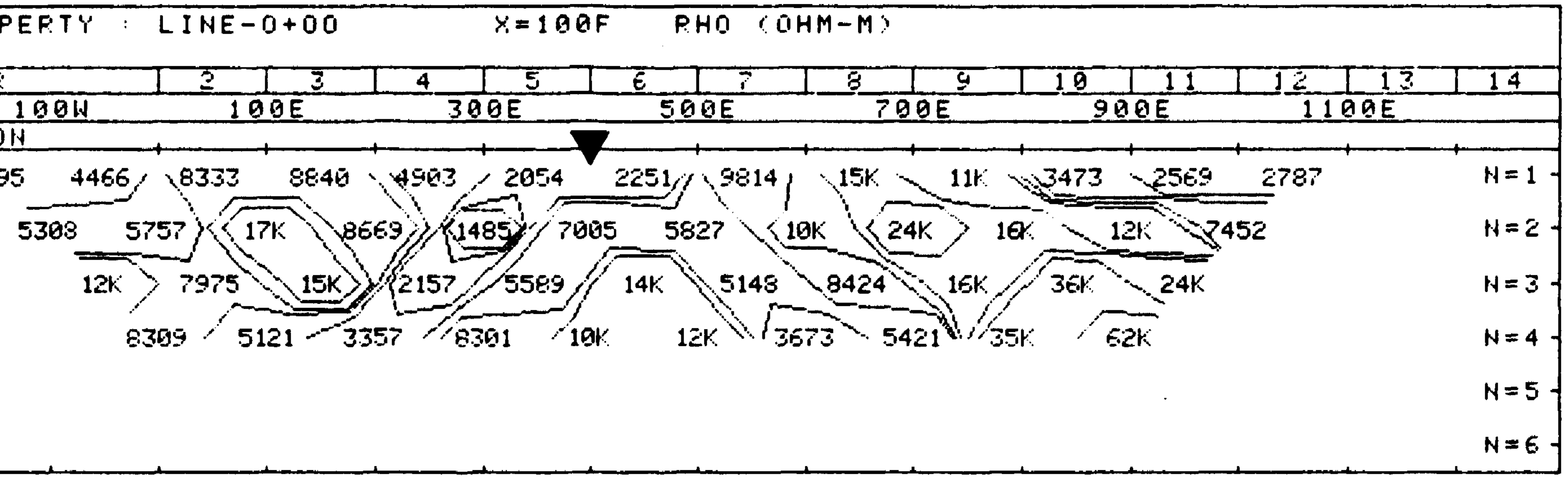
DATE SURVEYED: MAY 1985
APPROVED: P.G.HALLOF
DATE

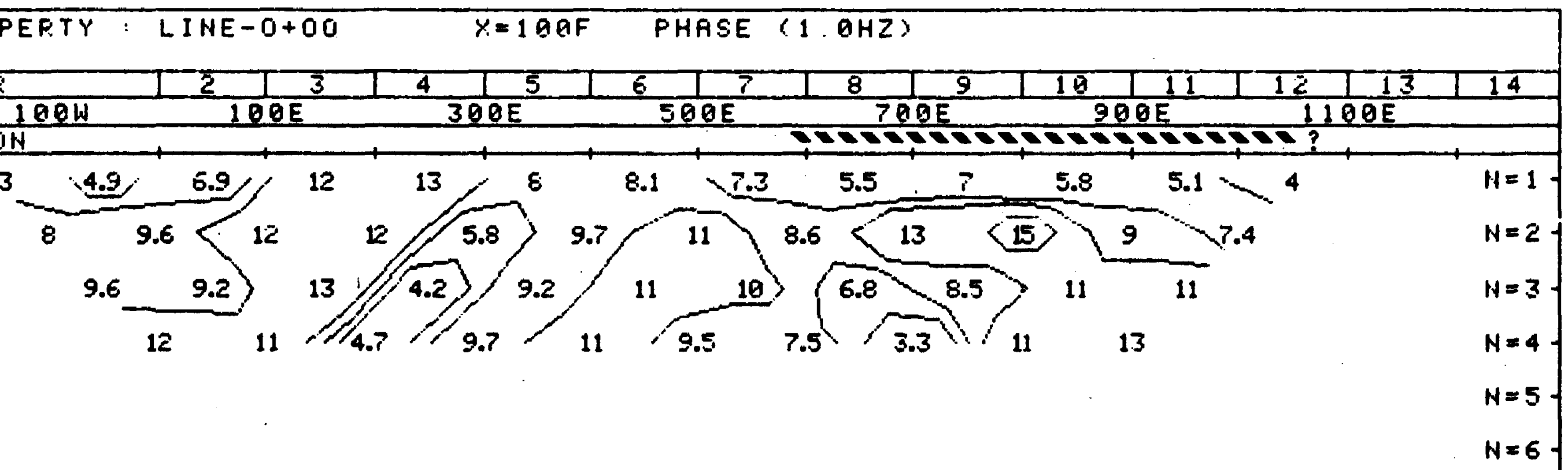
PHOENIX GEOPHYSICS LTD.

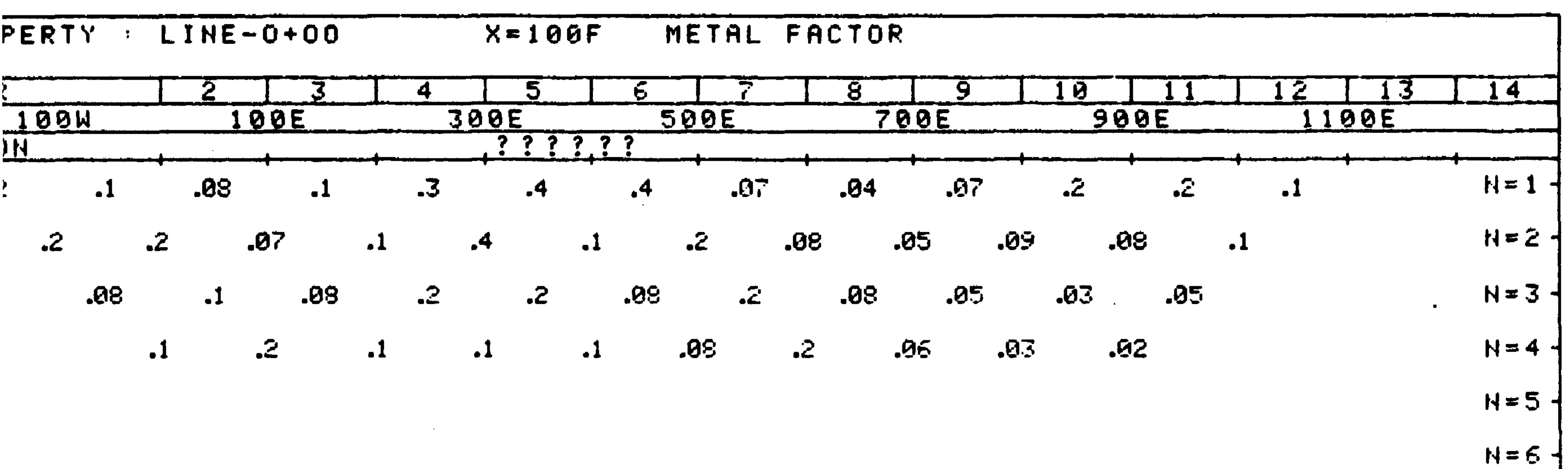
INDUCED POLARIZATION AND RESISTIVITY SURVEY

om84-378 63.4978

DWG. NO.-I.P.-5404-8





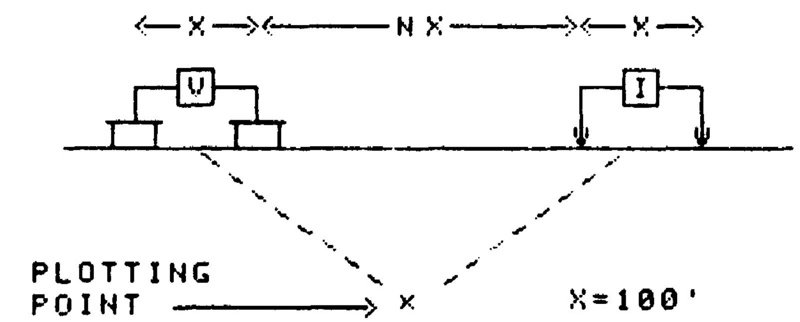


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-0+00



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE ▬▬▬
PROBABLE ▪▪▪▪▪▪
POSSIBLE ▲▲▲▲

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

DATE SURVEYED MAY 1985

APPROVED *Philip G. Hallof*

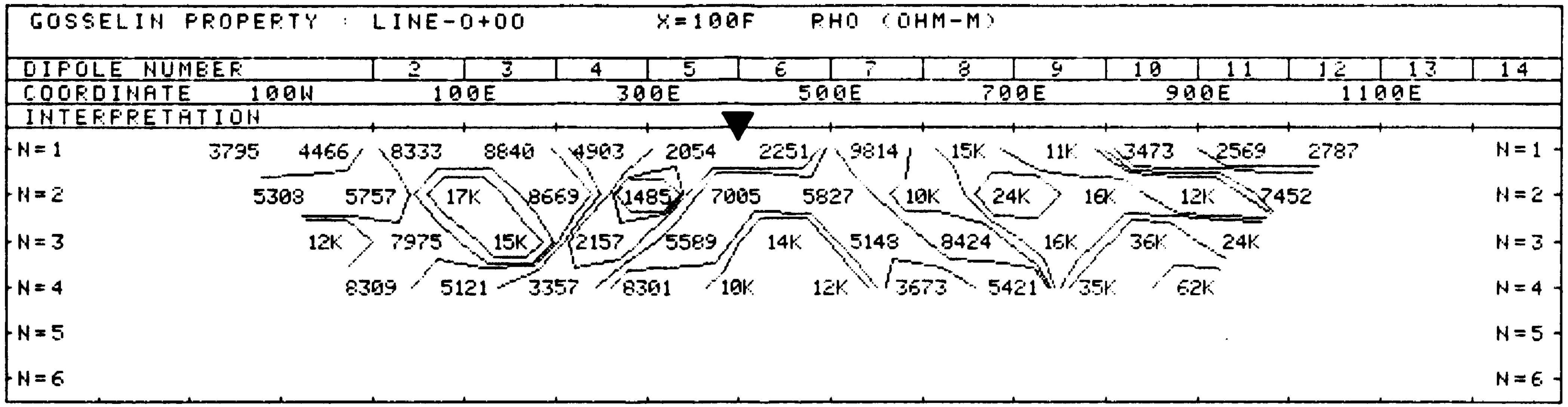
P. G. HALLOF

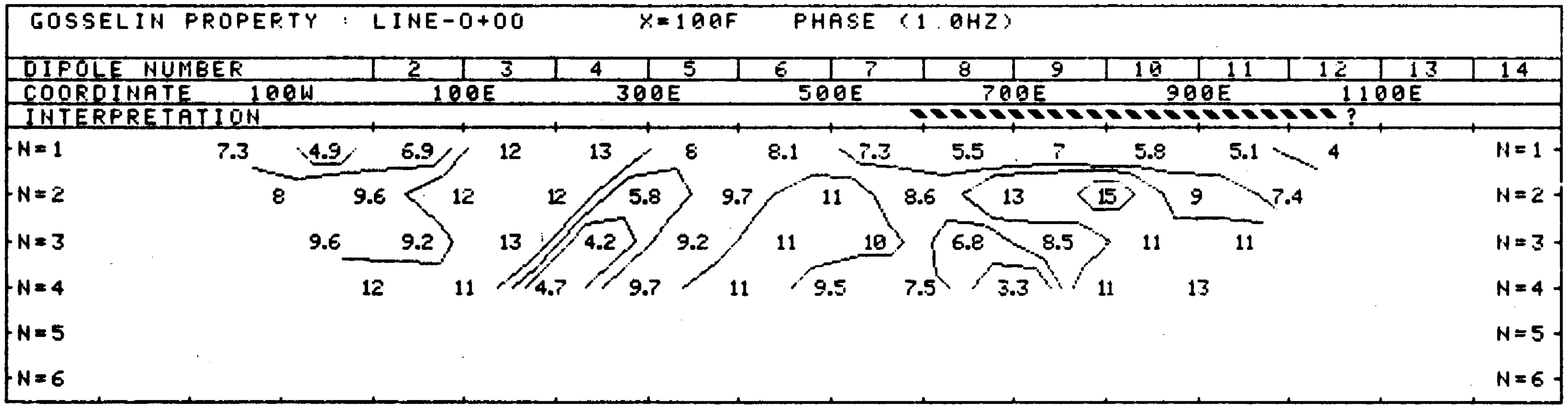
DATE *5/1/85*

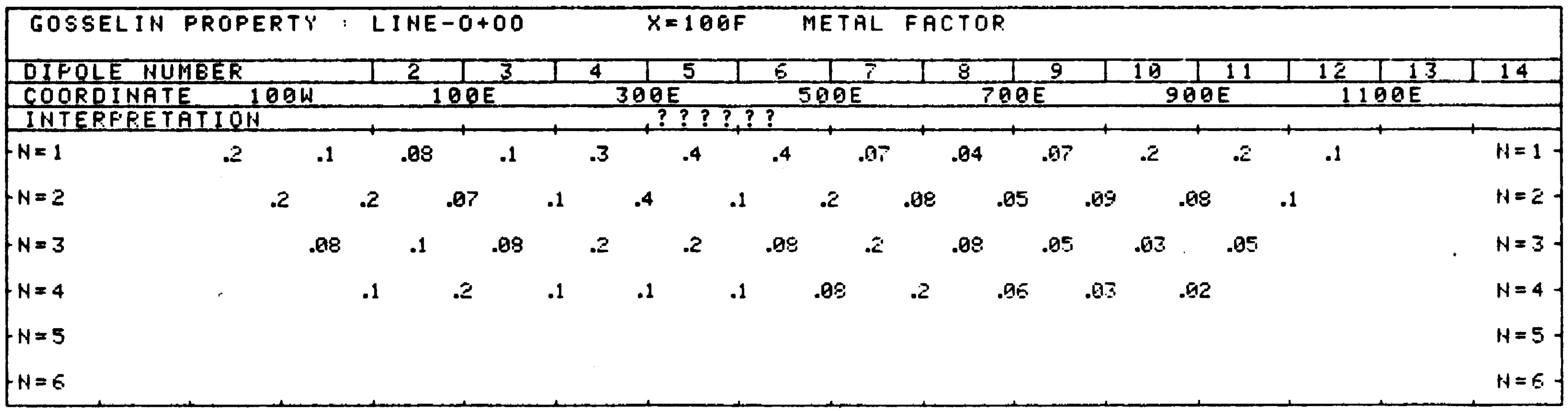
PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

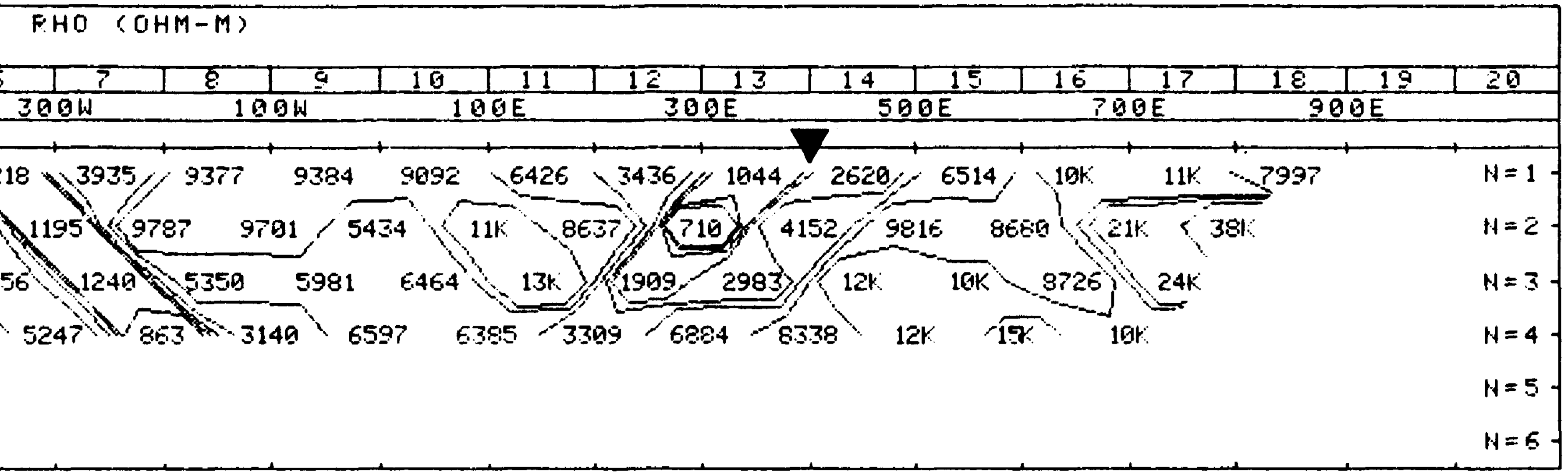
OM 84-357 *63.4978*

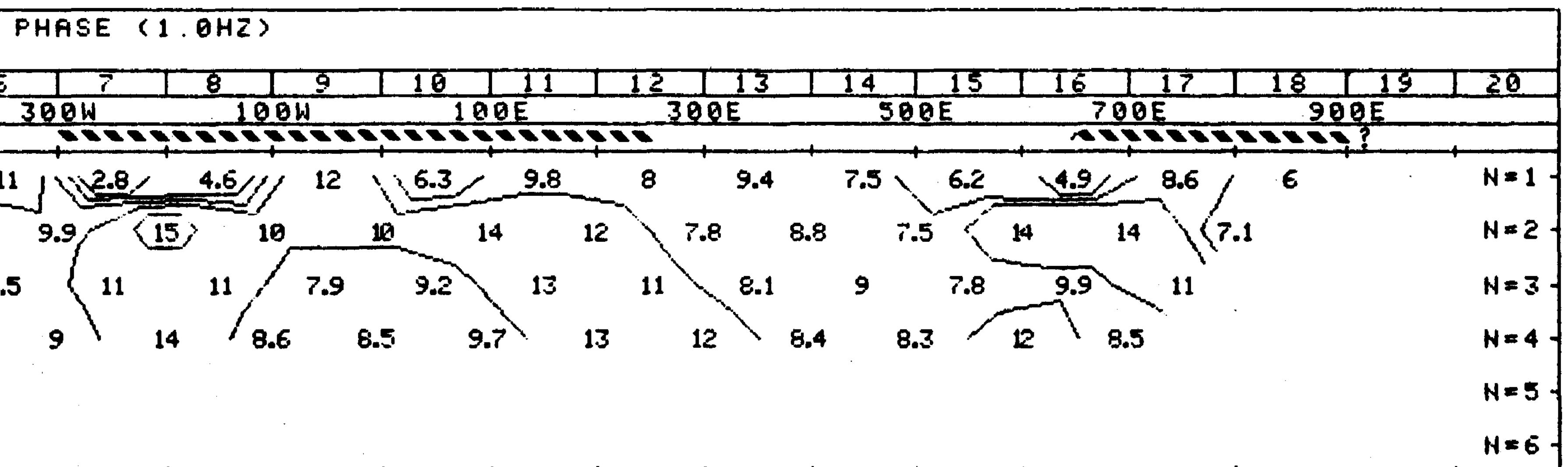

GOSSELIN PROPERTY : LINE-0+00 X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 100W 100E 300E 500E 700E 900E 1100E
INTERPRETATION
N=1 3795 4466 8333 8840 4903 2054 2251 9814 15K 11K 3473 2569 2787 N=1
N=2 5303 5757 17K 8669 1485 7005 5827 10K 24K 16K 12K 7452 N=2
N=3 12K 7975 15K 2157 5589 14K 5148 8424 16K 36K 24K N=3
N=4 8309 5121 3357 8301 10K 12K 3673 5421 35K 62K N=4
N=5 N=5
N=6 N=6

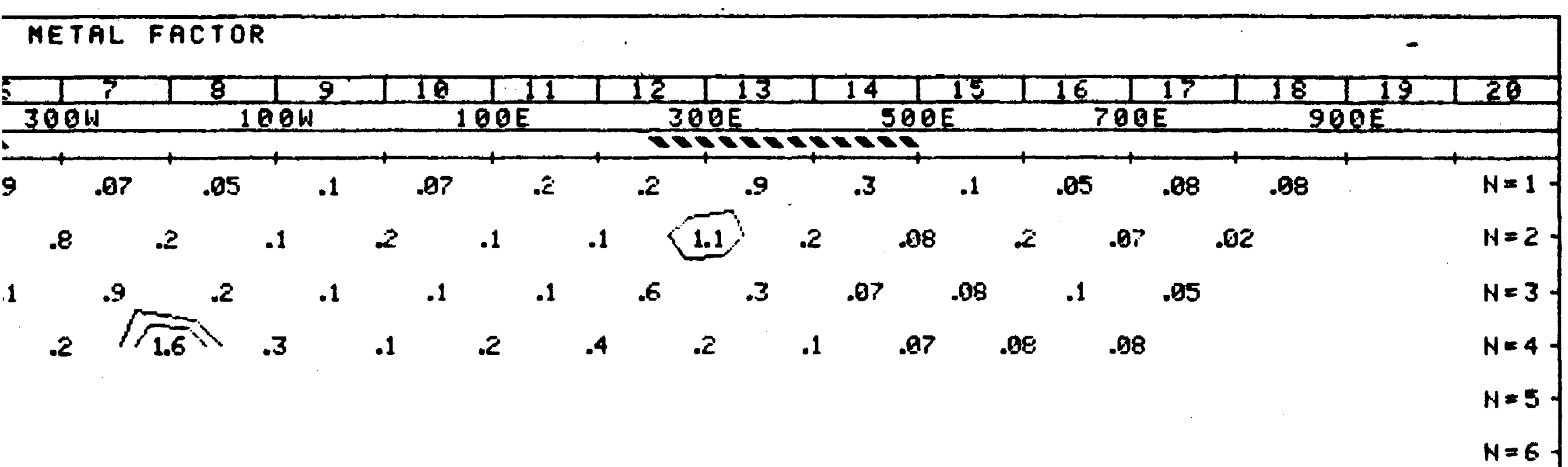

GOSSELIN PROPERTY : LINE-0+00 X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 100W 100E 300E 500E 700E 900E 1100E
INTERPRETATION ?
N=1 7.3 4.9 6.9 12 13 8 8.1 7.3 5.5 7 5.8 5.1 4 N=1
N=2 8 9.6 12 12 5.8 9.7 11 8.6 13 15 9 7.4 N=2
N=3 9.6 9.2 13 4.2 9.2 11 10 6.8 8.5 11 11 N=3
N=4 12 11 4.7 9.7 11 9.5 7.5 3.3 11 13 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY : LINE-0+00 X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 100W 100E 300E 500E 700E 900E 1100E
INTERPRETATION ??????
N=1 .2 .1 .08 .1 .3 .4 .4 .07 .04 .07 .2 .2 .1 N=1
N=2 .2 .2 .07 .1 .4 .1 .2 .08 .05 .09 .08 .1 N=2
N=3 .08 .1 .08 .2 .2 .08 .2 .08 .05 .03 .05 N=3
N=4 .1 .2 .1 .1 .1 .08 .2 .06 .03 .02 N=4
N=5 N=5
N=6 N=6

DWG. NO.-I.P.-5404-7





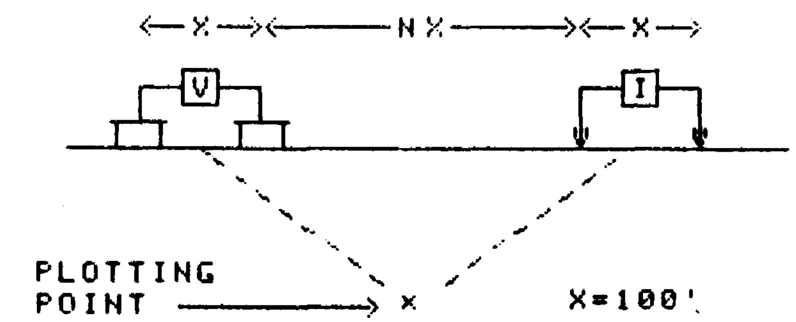


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA, ONTARIO

LINE NO.-4+00N



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

DATE SURVEYED ... 1985
APPROVED

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

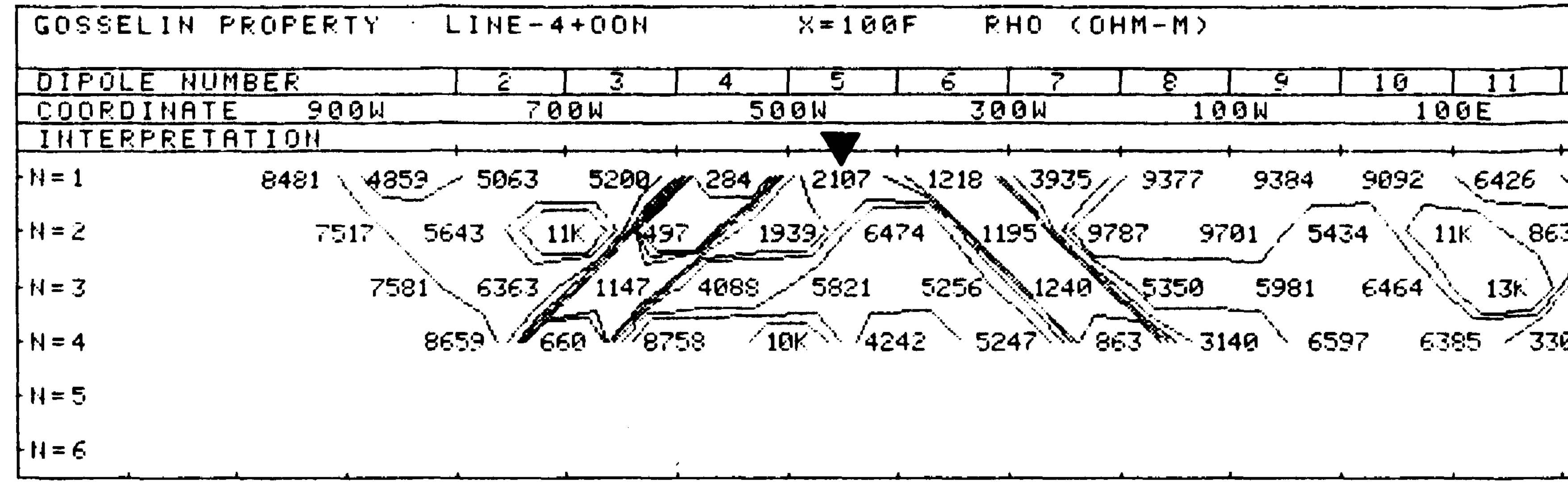
DATE

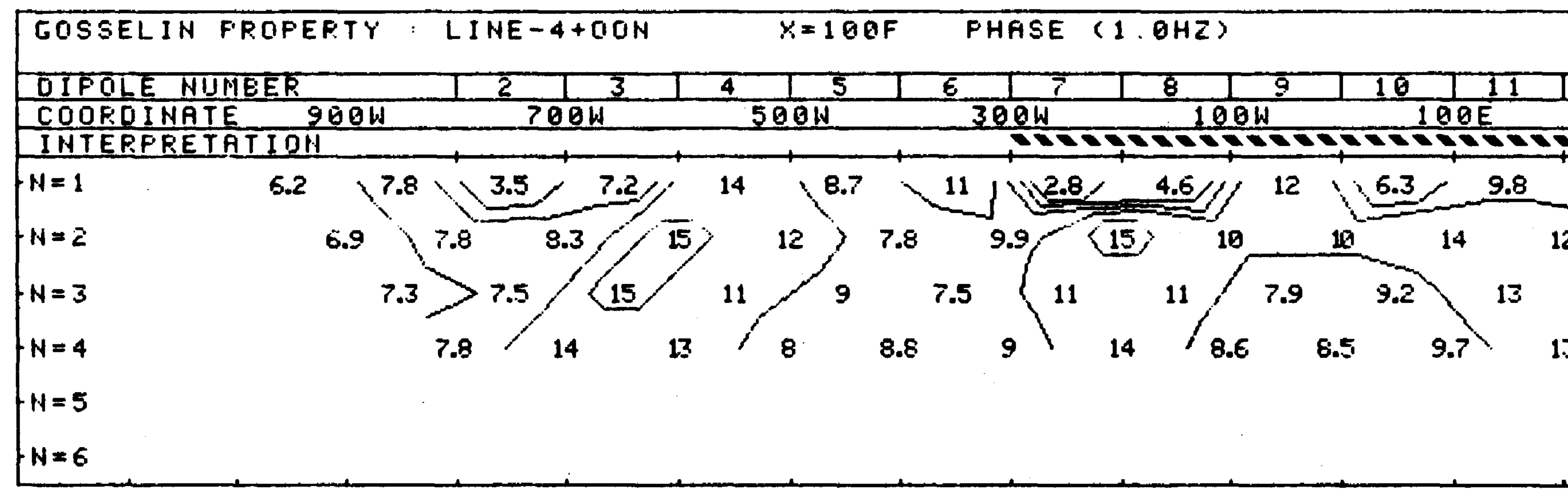
PHOENIX GEOPHYSICS LTD.

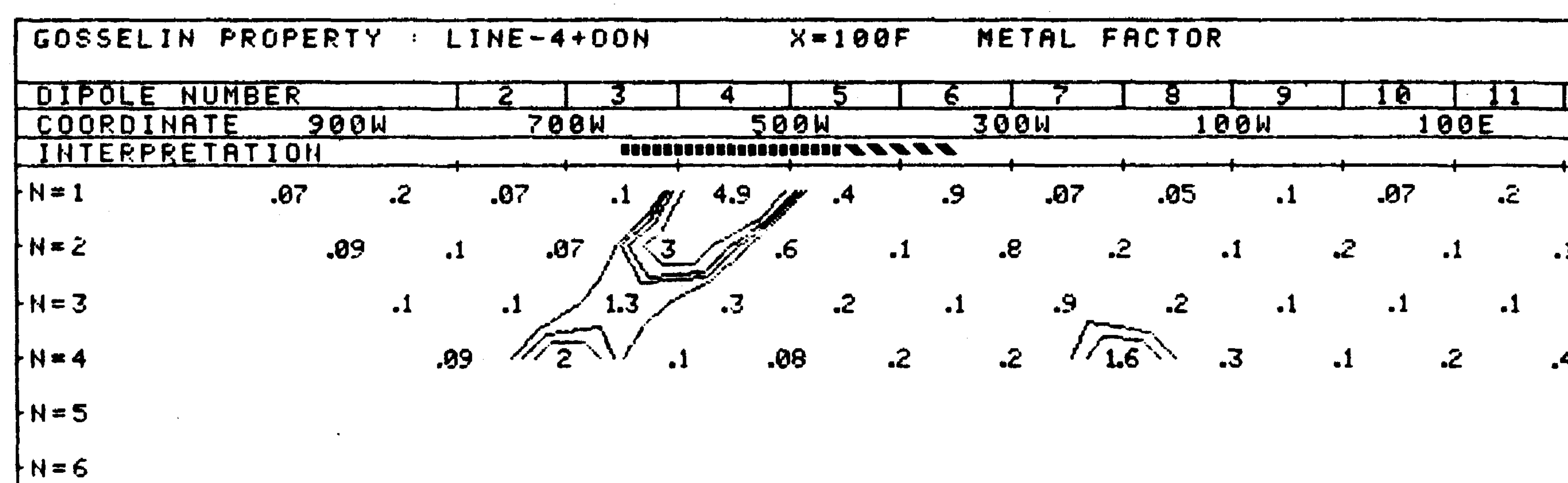
INDUCED POLARIZATION AND RESISTIVITY SURVEY

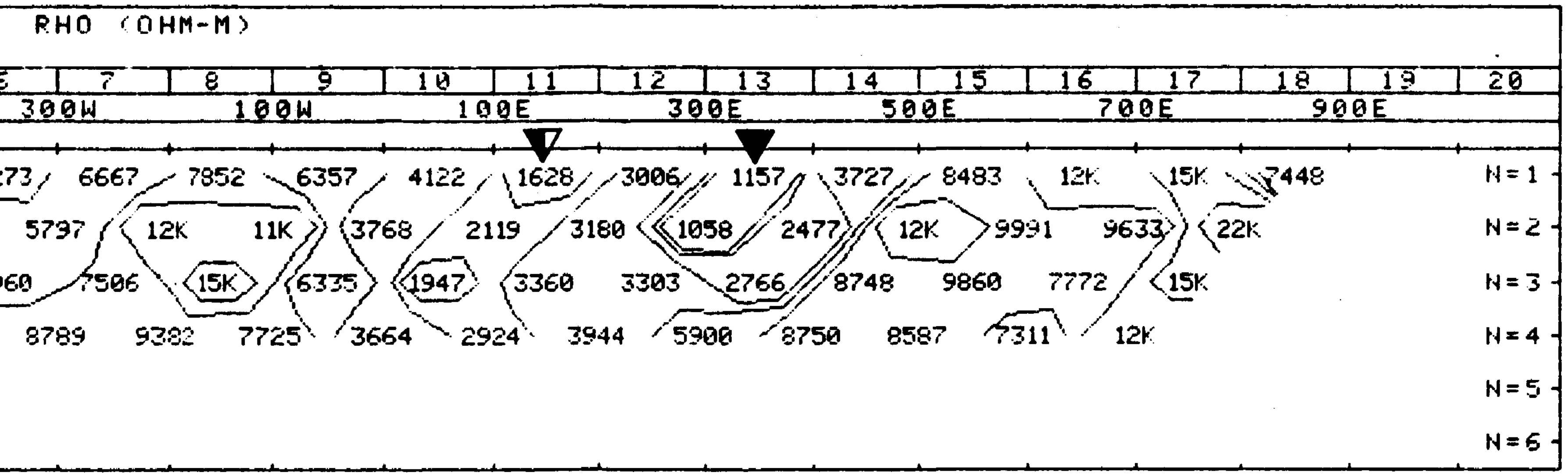
OM84-357

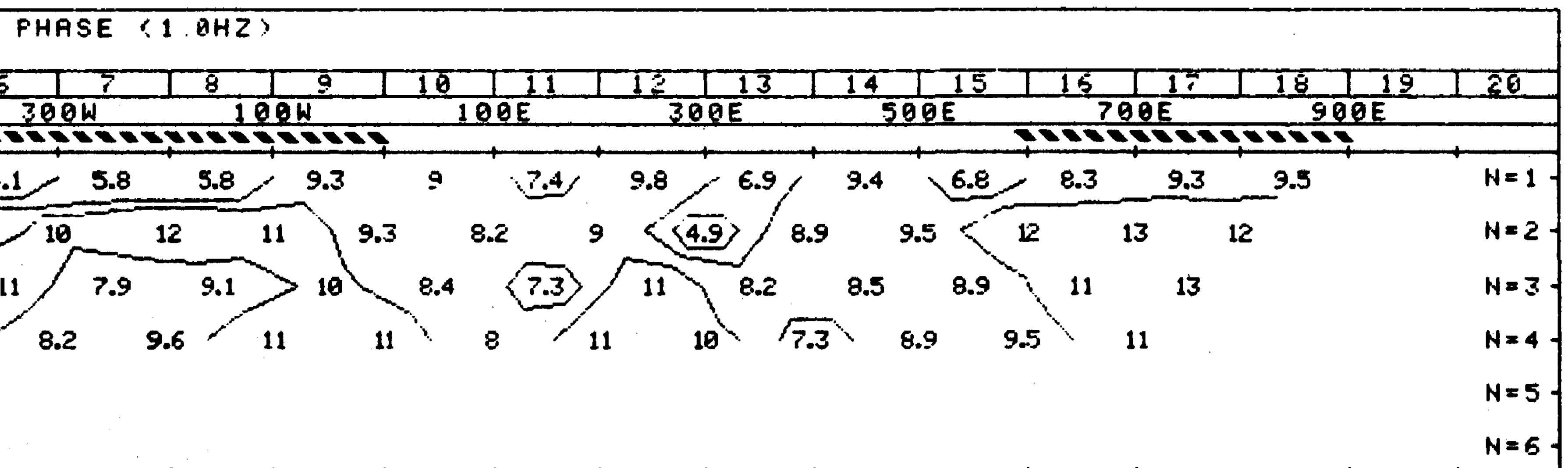
63.4478

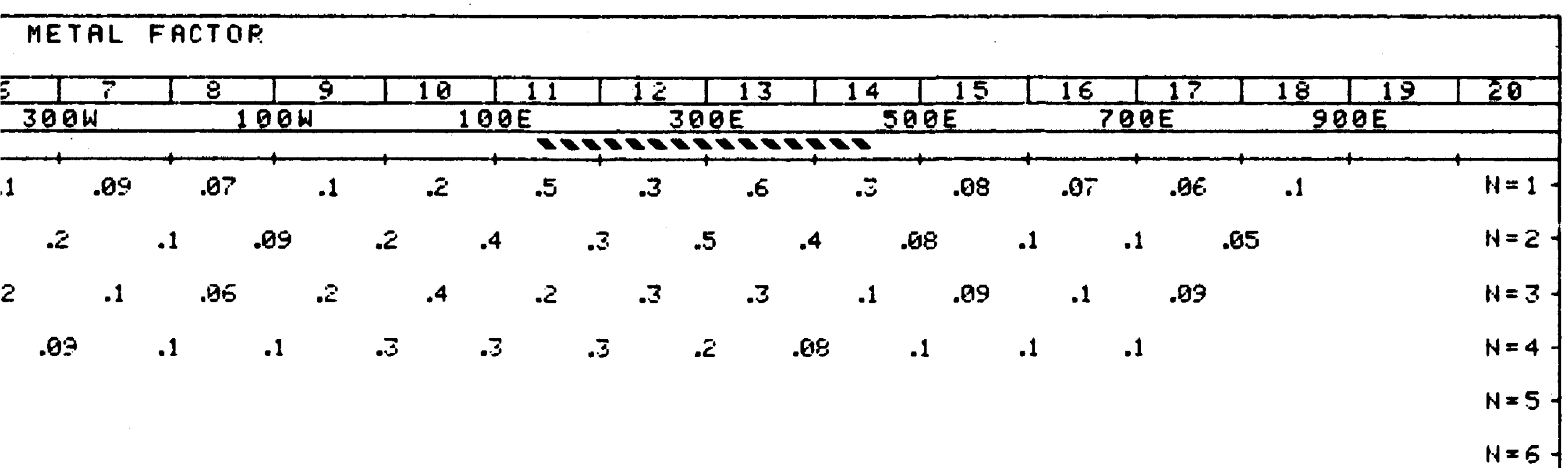

GOSSELIN PROPERTY : LINE-4+00N X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 8481 4859 5063 5200 284 2107 1218 3935 9377 9384 9092 6426
N=2 7517 5643 11K 497 1939 6474 1195 9787 9701 5434 11K 8637
N=3 7581 6363 1147 4088 5821 5256 1240 5350 5981 6464 13K
N=4 8659 660 8758 10K 4242 5247 863 3140 6597 6385 3309
N=5
N=6


GOSSELIN PROPERTY : LINE-4+00N X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 6.2 7.8 3.5 7.2 14 8.7 11 2.8 4.6 12 6.3 9.8
N=2 6.9 7.8 8.3 15 12 7.8 9.9 15 10 10 14 12
N=3 7.3 7.5 15 11 9 7.5 11 11 7.9 9.2 13
N=4 7.8 14 13 8 8.8 9 14 8.6 8.5 9.7 13
N=5
N=6


GOSSELIN PROPERTY : LINE-4+00N X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 .07 .2 .07 .1 4.9 .4 .9 .07 .05 .1 .07 .2
N=2 .09 .1 .07 3 .6 .1 .8 .2 .1 .2 .1 .1
N=3 .1 .1 1.3 .3 .2 .1 .9 .2 .1 .1 .1
N=4 .09 2 .1 .08 .2 .2 1.6 .3 .1 .2 .4
N=5
N=6





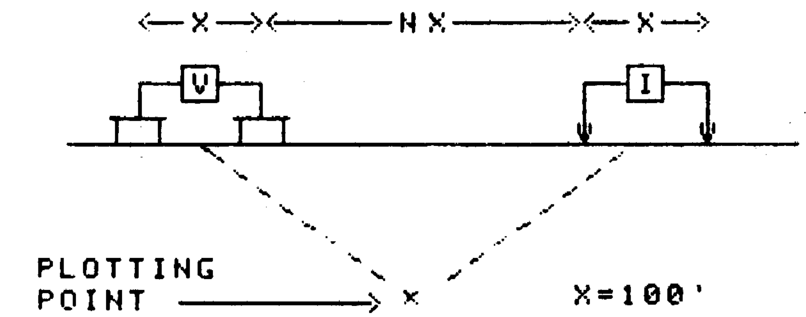


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-8+00N



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

DATE SURVEYED MAY 1985

APPROVED

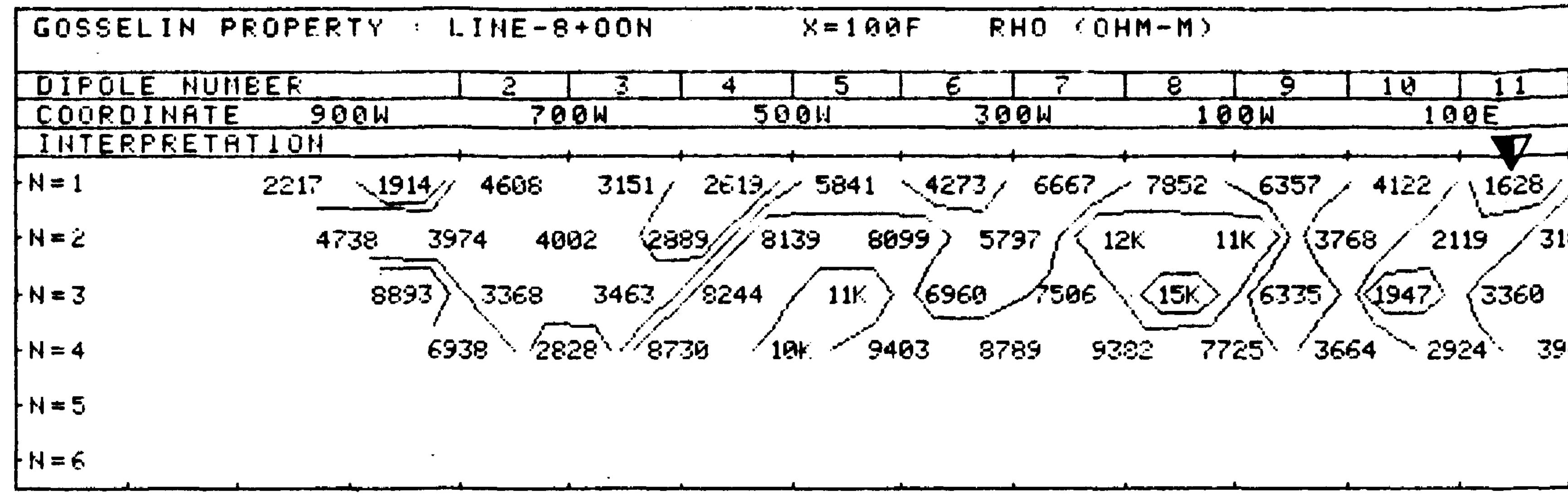
P. G. HALLOF

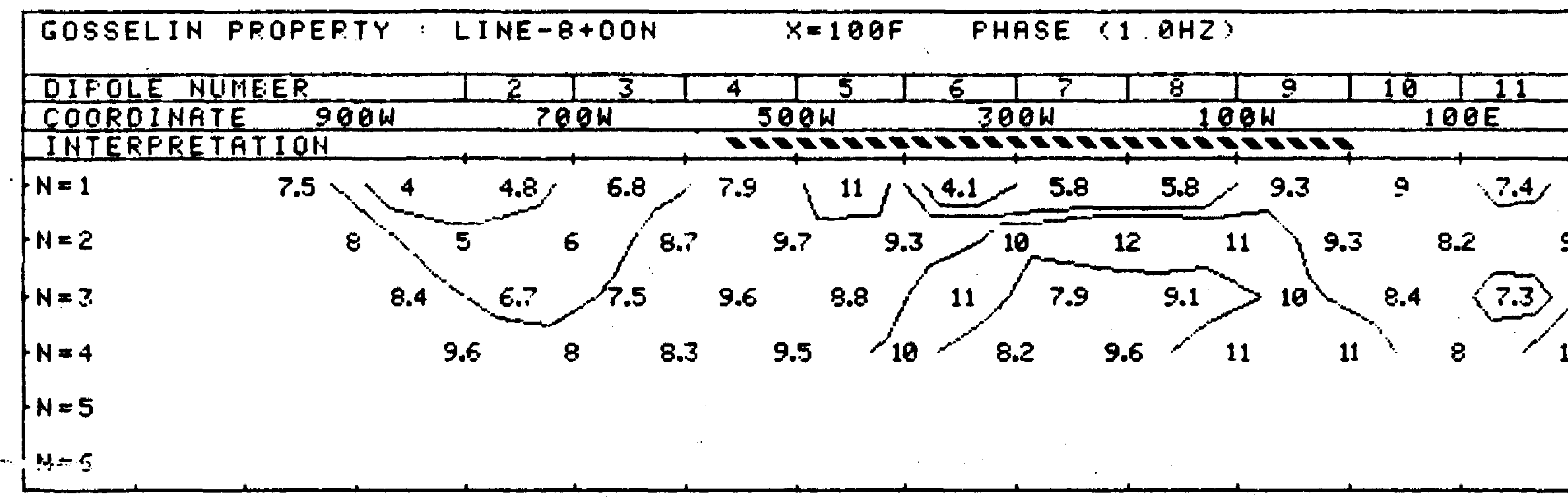
DATE 5/7/85

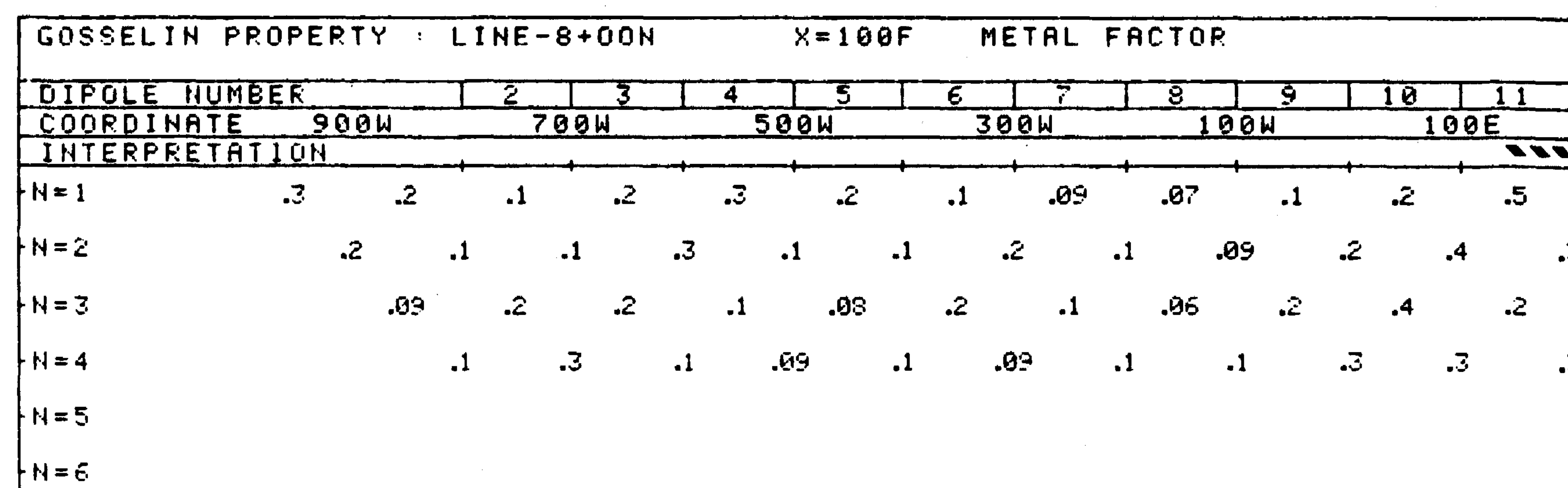
PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

OM 84-357 63.4978


GOSSELIN PROPERTY : LINE-8+00N X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 2217 1914 4608 3151 2619 5841 4273 6667 7852 6357 4122 1628
N=2 4738 3974 4002 2889 8139 8099 5797 12K 11K 3768 2119 318
N=3 8893 3368 3463 8244 11K 6960 7506 15K 6335 1947 3360
N=4 6938 2828 8730 10K 9403 8789 9382 7725 3664 2924 394
N=5
N=6


GOSSELIN PROPERTY : LINE-8+00N X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 7.5 4 4.8 6.8 7.9 11 4.1 5.8 5.8 9.3 9 7.4
N=2 8 5 6 8.7 9.7 9.3 10 12 11 9.3 8.2 9
N=3 8.4 6.7 7.5 9.6 8.8 11 7.9 9.1 10 8.4 7.3
N=4 9.6 8 8.3 9.5 10 8.2 9.6 11 11 8 11
N=5
N=6


GOSSELIN PROPERTY : LINE-8+00N X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 .3 .2 .1 .2 .3 .2 .1 .09 .07 .1 .2 .5
N=2 .2 .1 .1 .3 .1 .1 .2 .1 .09 .2 .4 .3
N=3 .09 .2 .2 .1 .08 .2 .1 .06 .2 .4 .2
N=4 .1 .3 .1 .09 .1 .09 .1 .1 .3 .3 .3
N=5
N=6

DWG. NO.-I.P.-5404-5

GOSSELIN PROPERTY : LINE-12+00N X=100F RHO (OHM-M)

DIPOLE NUMBER: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

COORDINATE: 800W, 600W, 400W, 200W, 0, 200E

INTERPRETATION

N=1	5406	4360	3999	6854	8052	8871	8366	11K	8830	8635
N=2	8326	4281	4207	8388	11K	9884	12K	18K	14K	18K
N=3	7733	3892	7881	13K	12K	8089	20K	20K	21K	
N=4	7112	7374	11K	13K	8944	12K	23K	27K		
N=5										
N=6										

GOSSELIN PROPERTY : LINE-12+00N X=100F PHASE (1.0HZ)

DIPOLE NUMBER: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

COORDINATE: 800W, 600W, 400W, 200W, 0, 200E

INTERPRETATION: possible (approx. 600W–400W); probable (approx. 400W–150E) ?

N=1	6.7	7.7	5	8.7	9.6	5	7.3	7.4	6.5	6
N=2	8.8	7.2	9.5	8.3	11	9.8	11	14	13	17
N=3	8.2	5.9	8.4	10	11	8.6	11	14	14	
N=4	9	7.5	9.2	9.3	9	8.9	13	14		
N=5										
N=6										

GOSSELIN PROPERTY : LINE-12+00N X=100F METAL FACTOR

DIPOLE NUMBER: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

COORDINATE: 800W, 600W, 400W, 200W, 0, 200E

INTERPRETATION

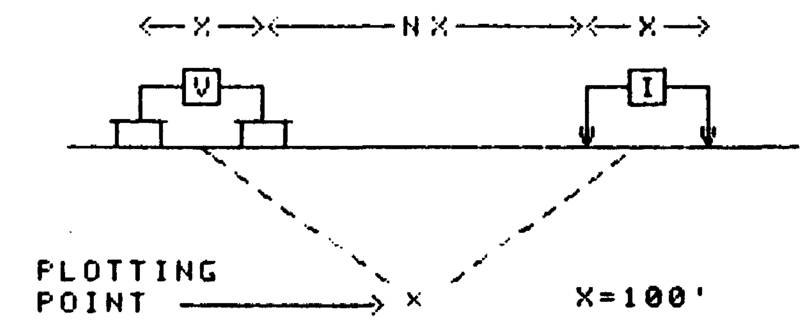
N=1	.1	.2	.1	.1	.1	.06	.09	.07	.07	.07
N=2	.1	.2	.2	.1	.1	.1	.09	.08	.09	.1
N=3	.1	.2	.1	.08	.09	.1	.06	.07	.06	
N=4	.1	.1	.08	.07	.1	.07	.06	.05		
N=5										
N=6										

ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-12+00N



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

DATE SURVEYED: MAY 1985

APPROVED: P.G. HALLOF

DATE

PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

OM 84-357 63.4978

GOSSELIN PROPERTY : LINE-12+00N X=100F RHO (OHM-M)

DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11

COORDINATE 800W 600W 400W 200W 0 200E

INTERPRETATION

N																				
N=1		5406		4360		3999		6854		8052		8871		8366		11K		8830		8635
N=2	8326		4281		4207		8388		11K		9884		12K		18K		14K		18K	
N=3		7733		3892		7881		13K		12K		8089		20K		20K		21K		
N=4			7112		7374		11K		13K		8944		12K		23K		27K			
N=5																				
N=6																				

GOSSELIN PROPERTY : LINE-12+00N X=100F PHASE (1.0HZ)

DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11

COORDINATE 800W 600W 400W 200W 0 200E

INTERPRETATION ?

N																				
N=1		6.7		7.7		5		8.7		9.6		5		7.3		7.4		6.5		6
N=2	8.8		7.2		9.5		8.3		11		9.8		11		14		13		17	
N=3		8.2		5.9		8.4		10		11		8.6		11		14		14		
N=4			9		7.5		9.2		9.3		9		8.9		13		14			
N=5																				
N=6																				

GOSSELIN PROPERTY : LINE-12+00N X=100F METAL FACTOR

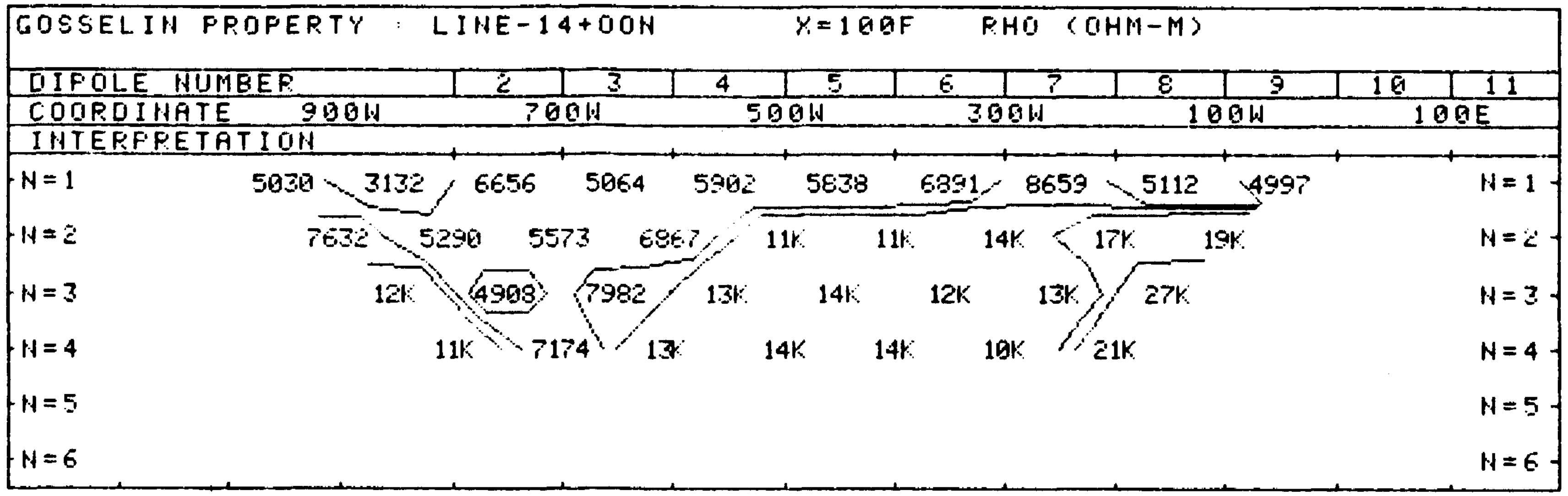
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11

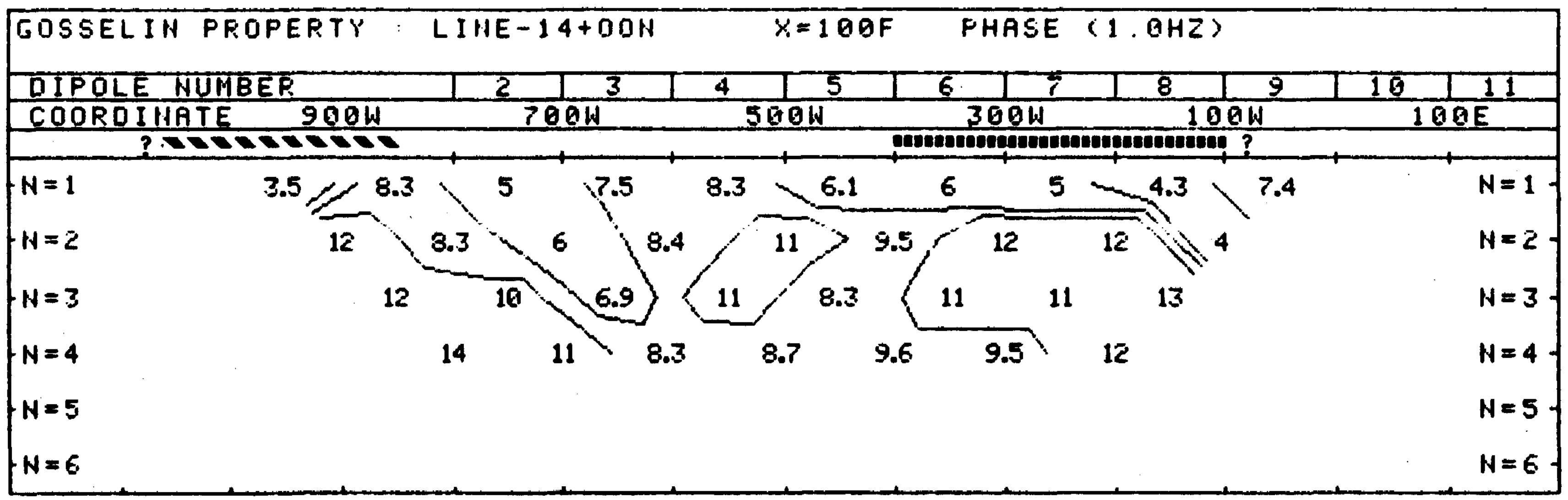
COORDINATE 800W 600W 400W 200W 0 200E

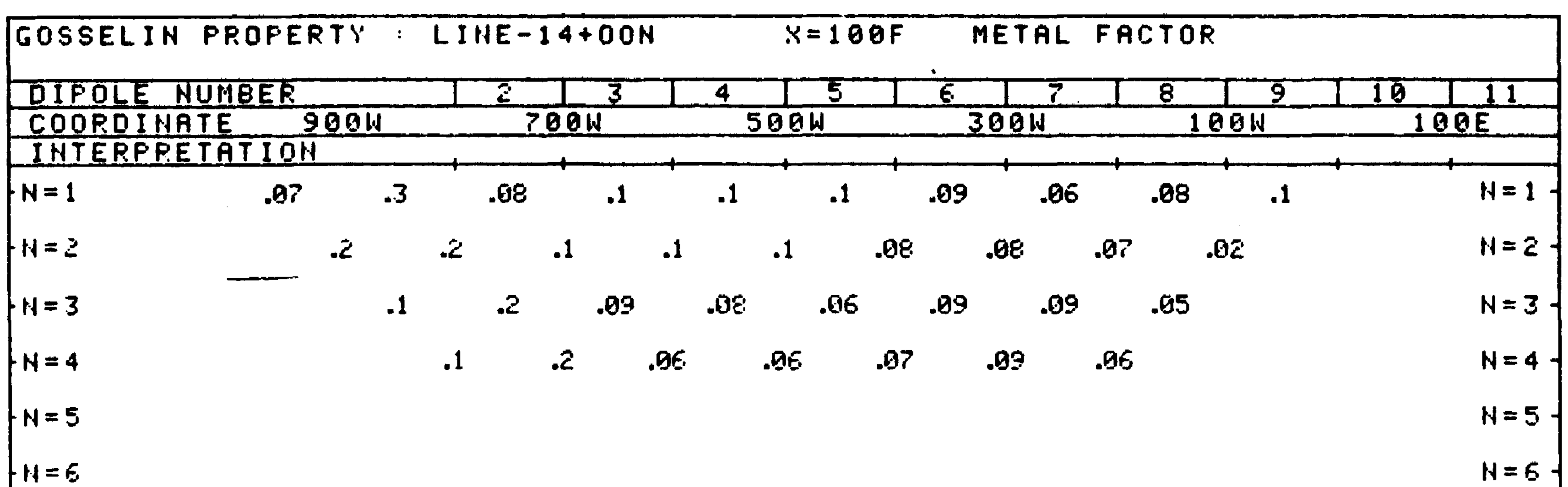
INTERPRETATION

N																				
N=1		.1		.2		.1		.1		.1		.06		.09		.07		.07		.07
N=2	.1		.2		.2		.1		.1		.1		.09		.08		.09		.1	
N=3		.1		.2		.1		.08		.09		.1		.06		.07		.06		
N=4			.1		.1		.08		.07		.1		.07		.06		.05			
N=5																				
N=6																				

DWG. NO.-I.P.-5404-4





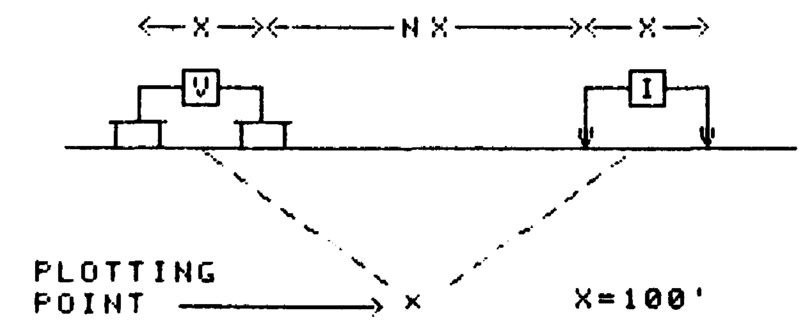


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-14+00N



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

DATE SURVEYED: MAY 1985.
APPROVED
P. G. HALLOF
DATE

PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

OM 84-357 63.4976

GOSSELIN PROPERTY : LINE-14+00N X=100F RHO (OHM-M)

DIPOLE NUMBER: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

COORDINATE: 900W, 700W, 500W, 300W, 100W, 100E

INTERPRETATION

N=1	5030	3132	6656	5064	5902	5838	6891	8659	5112	4997
N=2	7632	5290	5573	6867	11K	11K	14K	17K	19K	
N=3	12K	4908	7982	13K	14K	12K	13K	27K		
N=4	11K	7174	13K	14K	14K	10K	21K			
N=5										
N=6										

GOSSELIN PROPERTY : LINE-14+00N X=100F PHASE (1.0HZ)

DIPOLE NUMBER: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

COORDINATE: 900W, 700W, 500W, 300W, 100W, 100E

? ?

N=1	3.5	8.3	5	7.5	8.3	6.1	6	5	4.3	7.4
N=2	12	8.3	6	8.4	11	9.5	12	12	4	
N=3	12	10	6.9	11	8.3	11	11	13		
N=4	14	11	8.3	8.7	9.6	9.5	12			
N=5										
N=6										

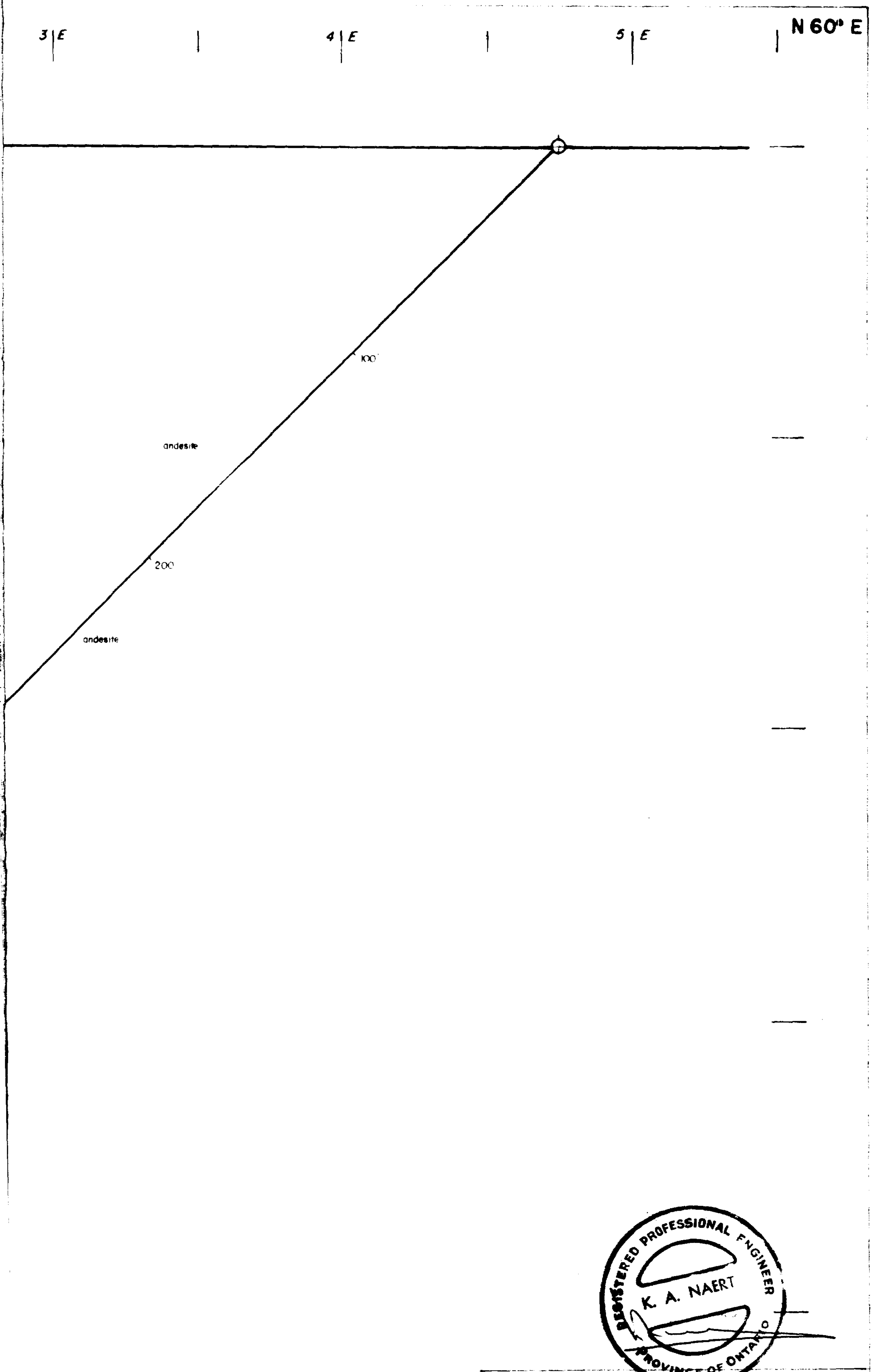
GOSSELIN PROPERTY : LINE-14+00N X=100F METAL FACTOR

DIPOLE NUMBER: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

COORDINATE: 900W, 700W, 500W, 300W, 100W, 100E

INTERPRETATION

N=1	.07	.3	.08	.1	.1	.1	.09	.06	.08	.1
N=2	.2	.2	.1	.1	.1	.08	.08	.07	.02	
N=3	.1	.2	.09	.08	.06	.09	.09	.05		
N=4	.1	.2	.06	.06	.07	.09	.06			
N=5										
N=6										



ONITAP RESOURCES INC.

SHINING TREE AREA CLAIMS
ASQUITH TWP , DISTRICT OF SUDBURY, ONTARIO

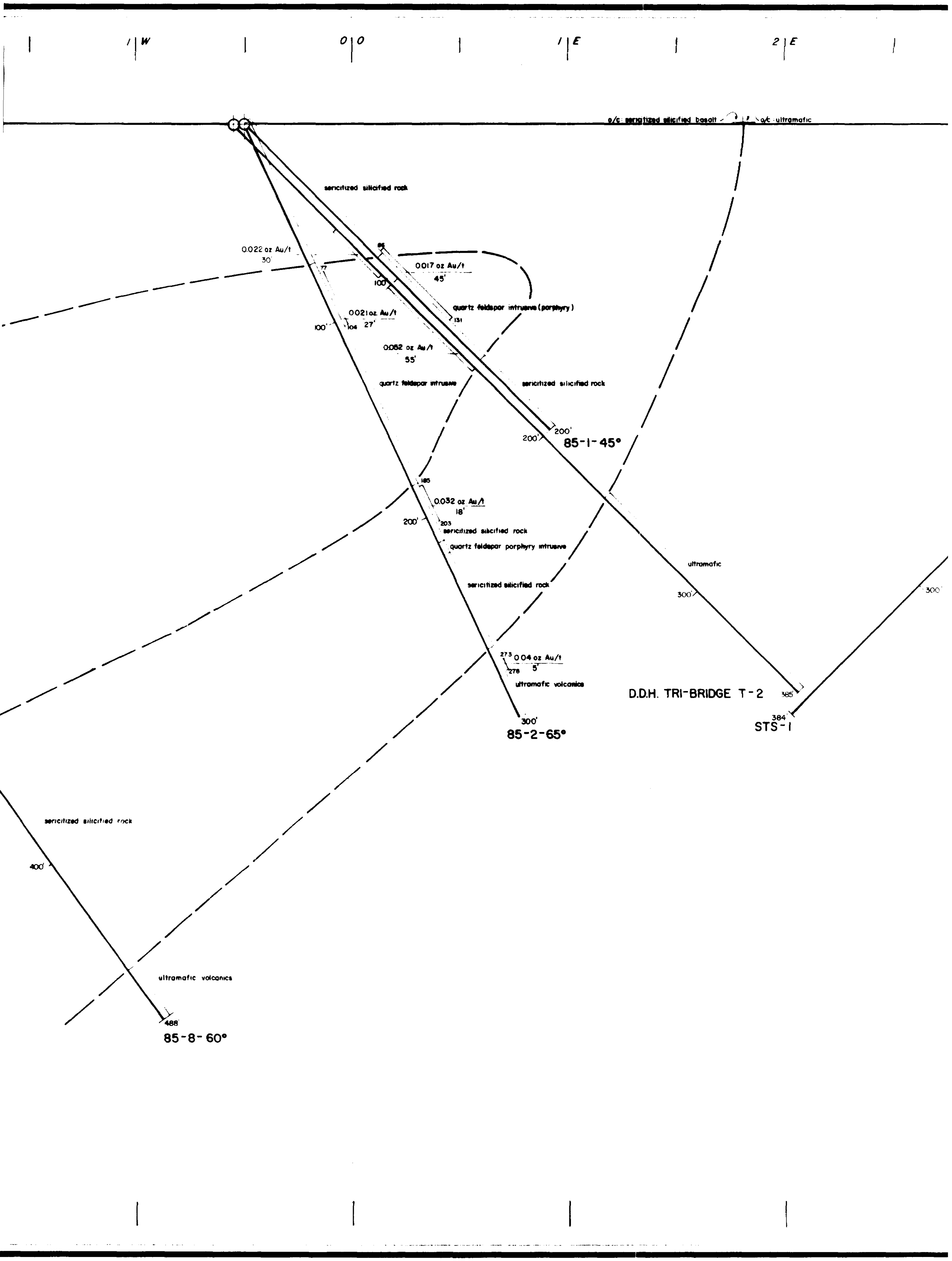
SECTION 14 + 00 N

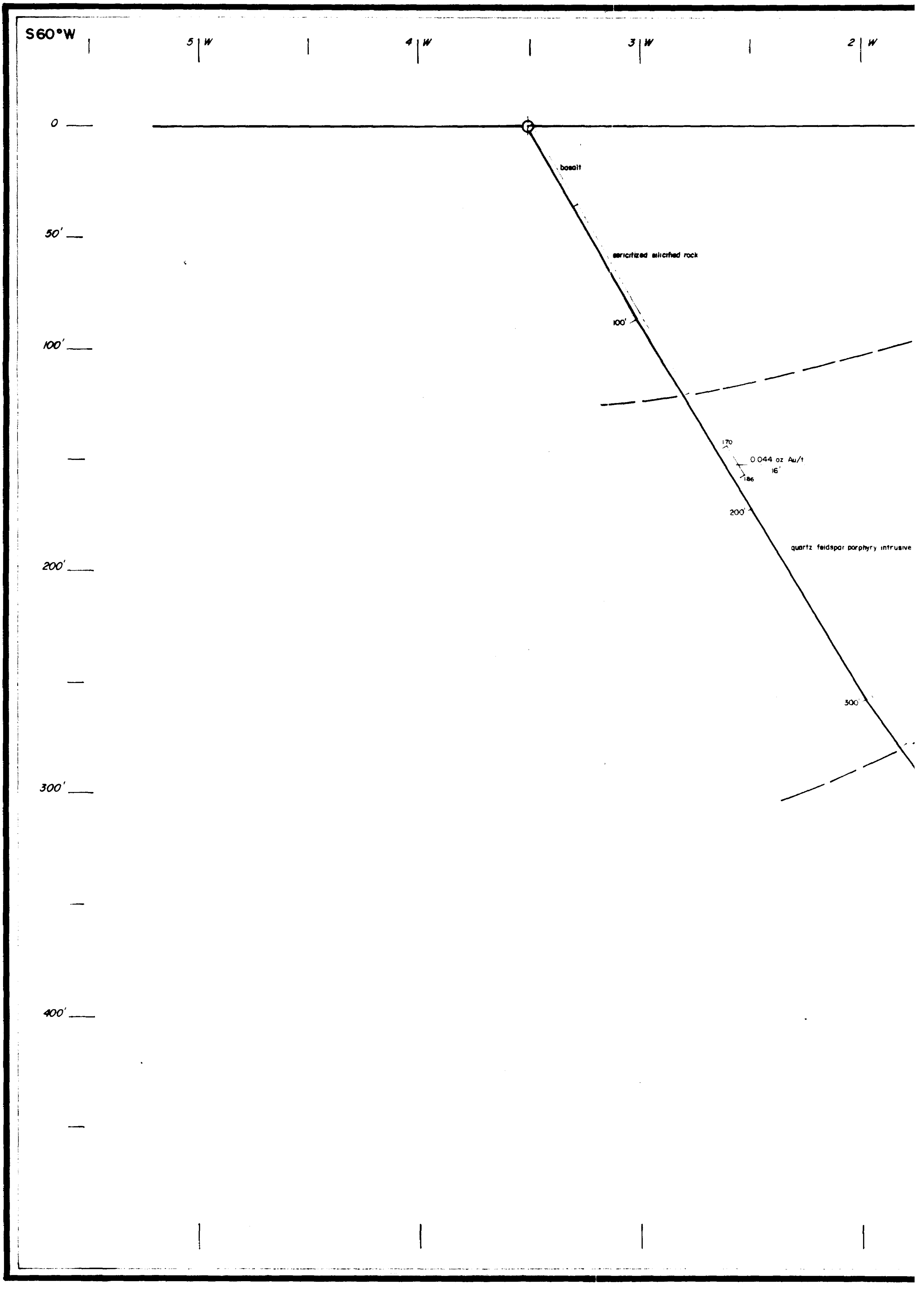
Work by Norex	Date Jun. 1985.	Scale 1" = 40'
Drawn by M.E.O.	Date Jun. 1985.	

NAREX Ore Search Consultants Inc

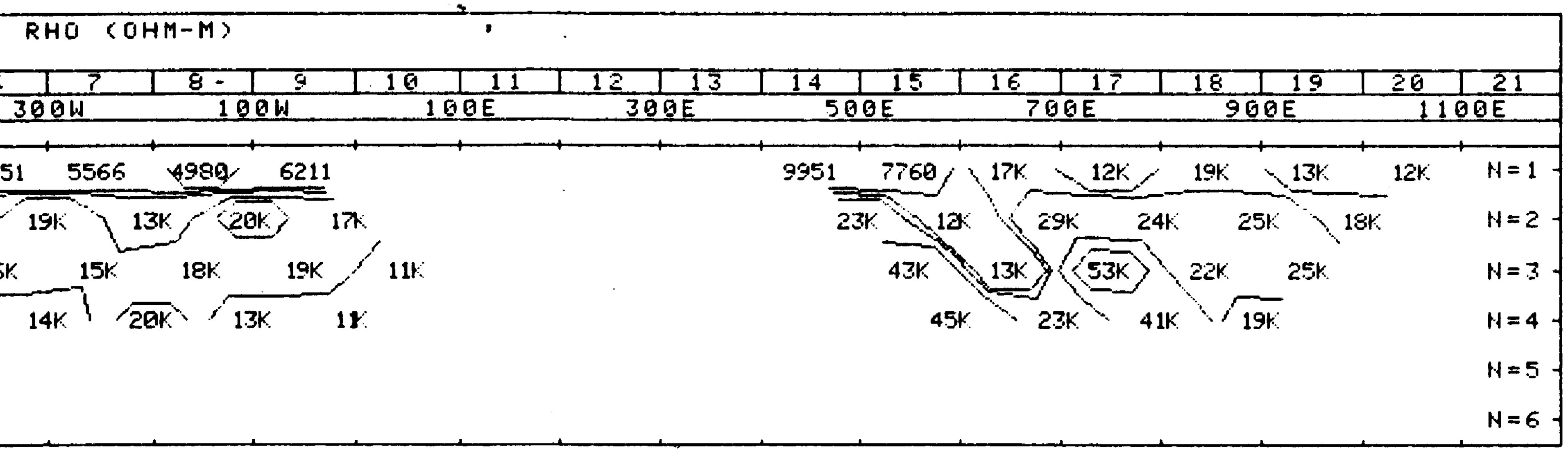
FIG.

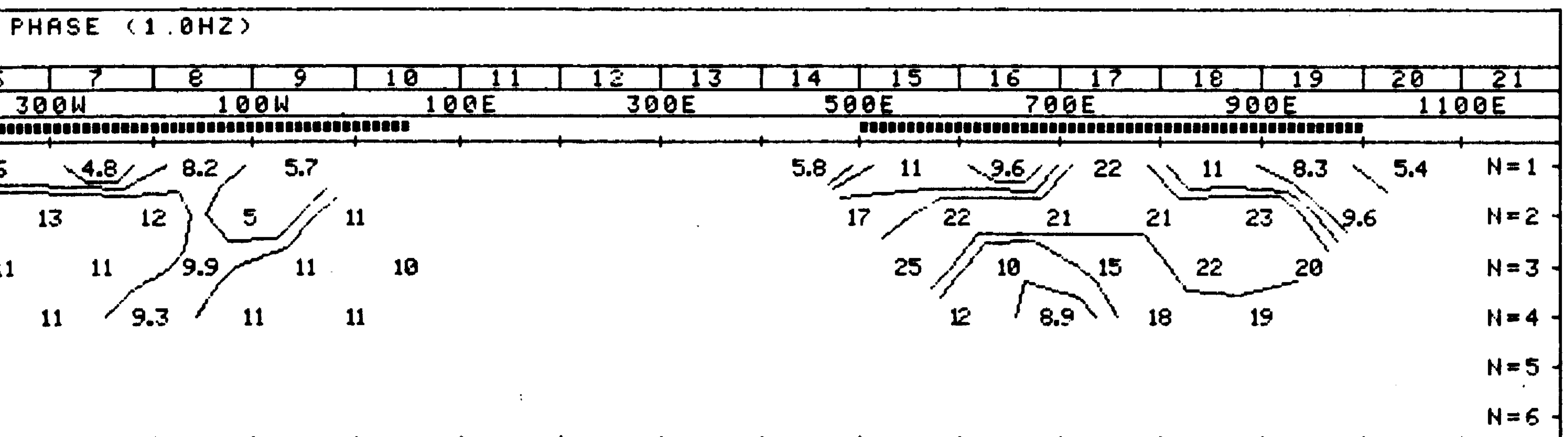
63.4978
OM84-357

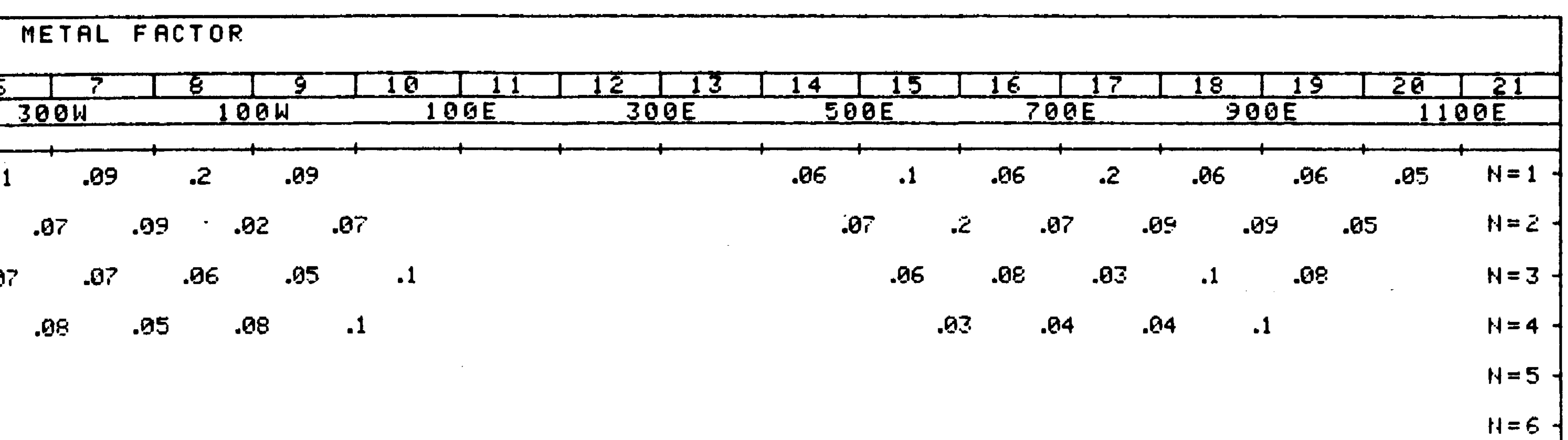

1 W
0 0
1 E
2 E
o/c sericitized silicified basalt
o/c ultramafic
sericitized silicified rock
0.022 oz Au/t
30'
77
95
0.017 oz Au/t
45'
100'
quartz feldspar intrusive (porphyry)
131
0.021 oz Au/t
104
27'
100'
0.052 oz Au/t
55'
quartz feldspar intrusive
sericitized silicified rock
200'
200'
85-1-45°
185
0.032 oz Au/t
18'
200'
203
sericitized silicified rock
quartz feldspar porphyry intrusive
sericitized silicified rock
ultramafic
300'
300'
273
0.04 oz Au/t
278
5'
ultramafic volcanics
D.D.H. TRI-BRIDGE T-2
385
300'
85-2-65°
384
STS-1
sericitized silicified rock
400'
ultramafic volcanics
488
85-8-60°


S60°W
5 W
4 W
3 W
2 W
0
50'
100'
200'
300'
400'
basalt
sericitized silicified rock
100'
170
0.044 oz Au/t
16'
186
200'
quartz feldspar porphyry intrusive
300'

DWG. NO.-I.P-5404-3





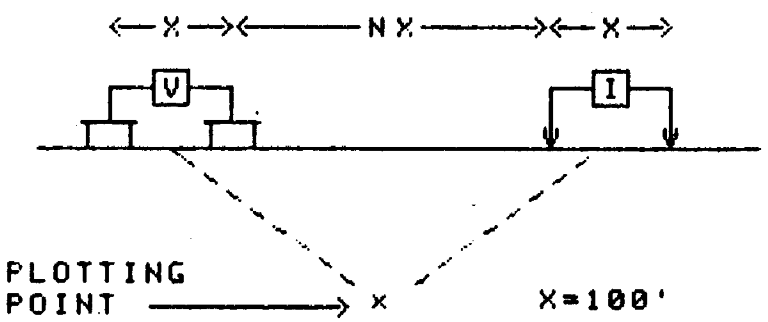


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-16+00N



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

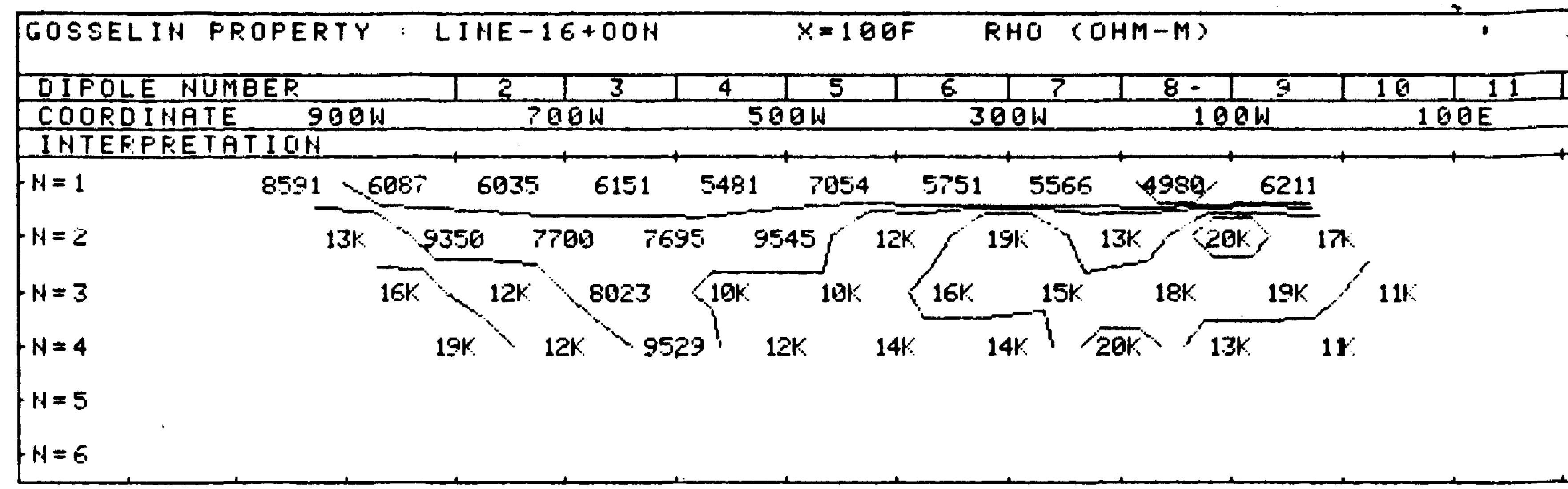
NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

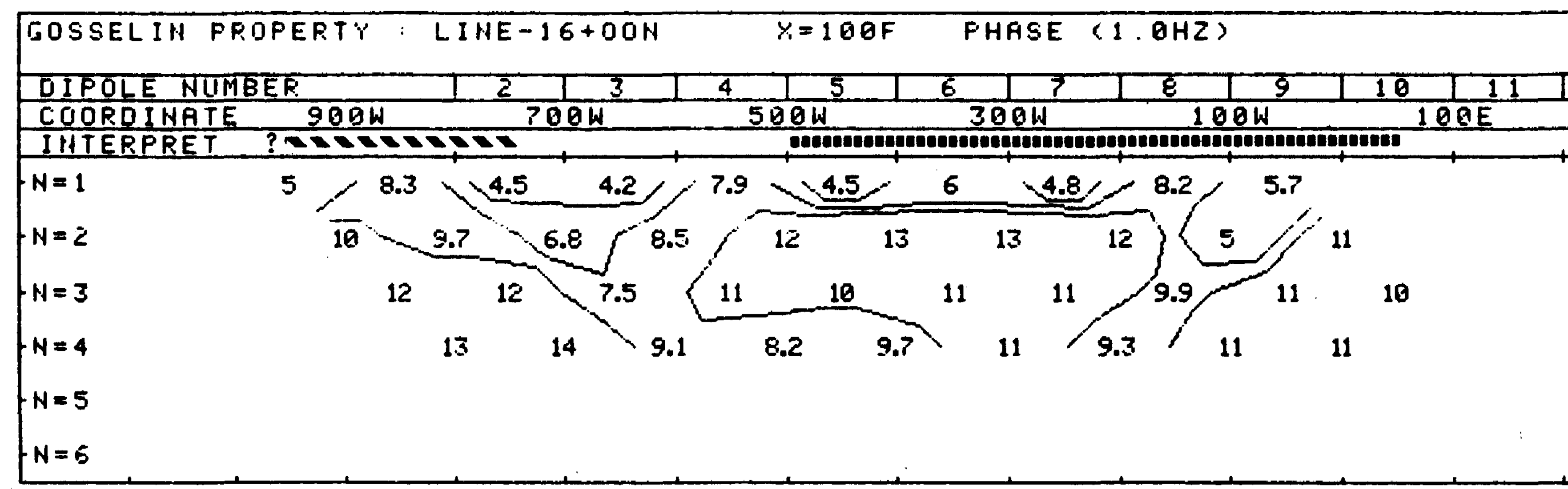
DATE SURVEYED: MAY 1985
APPROVED: Philip G. Hallof
DATE

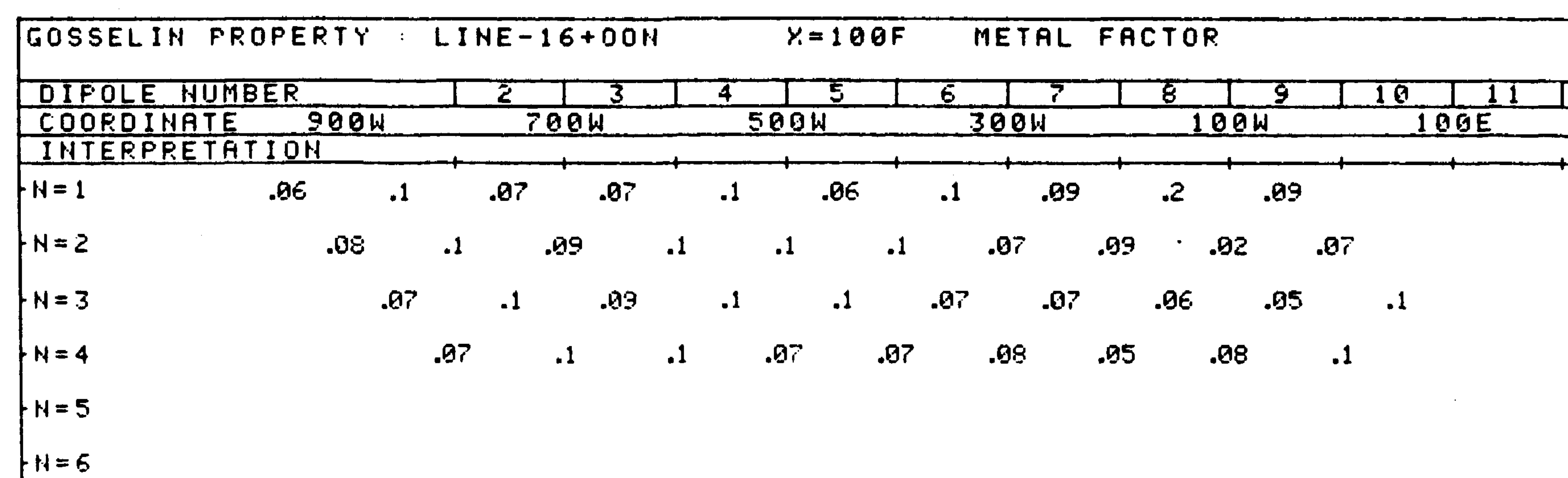
PHOENIX GEOPHYSICS LTD.

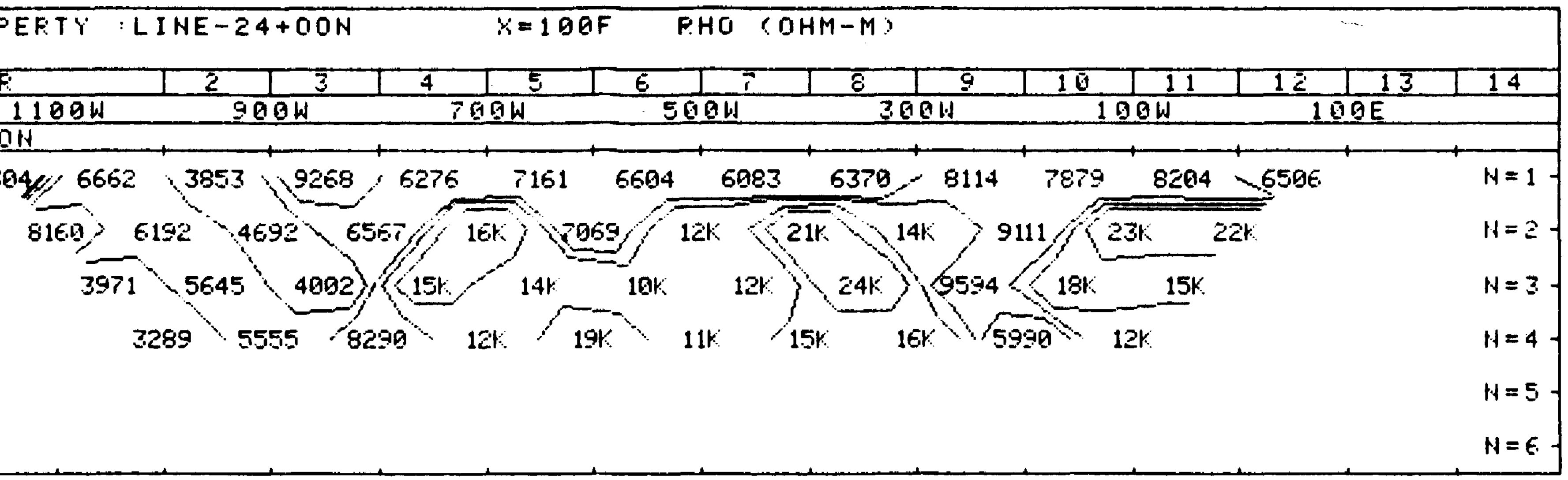
INDUCED POLARIZATION AND RESISTIVITY SURVEY

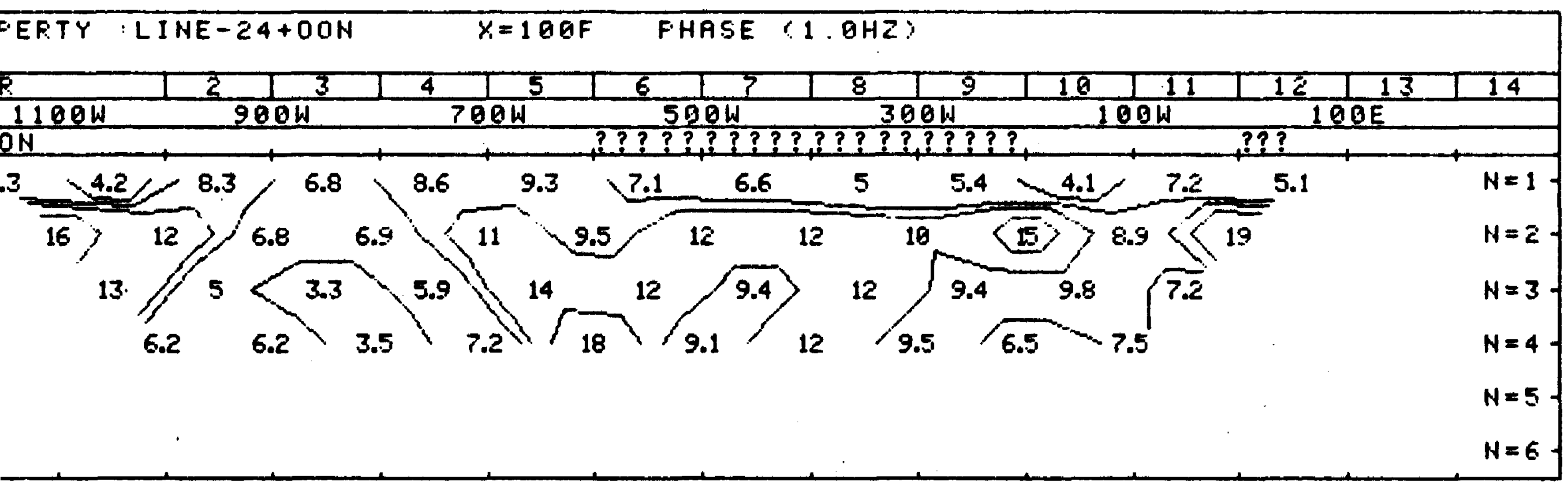
OM 84-357 63.4978

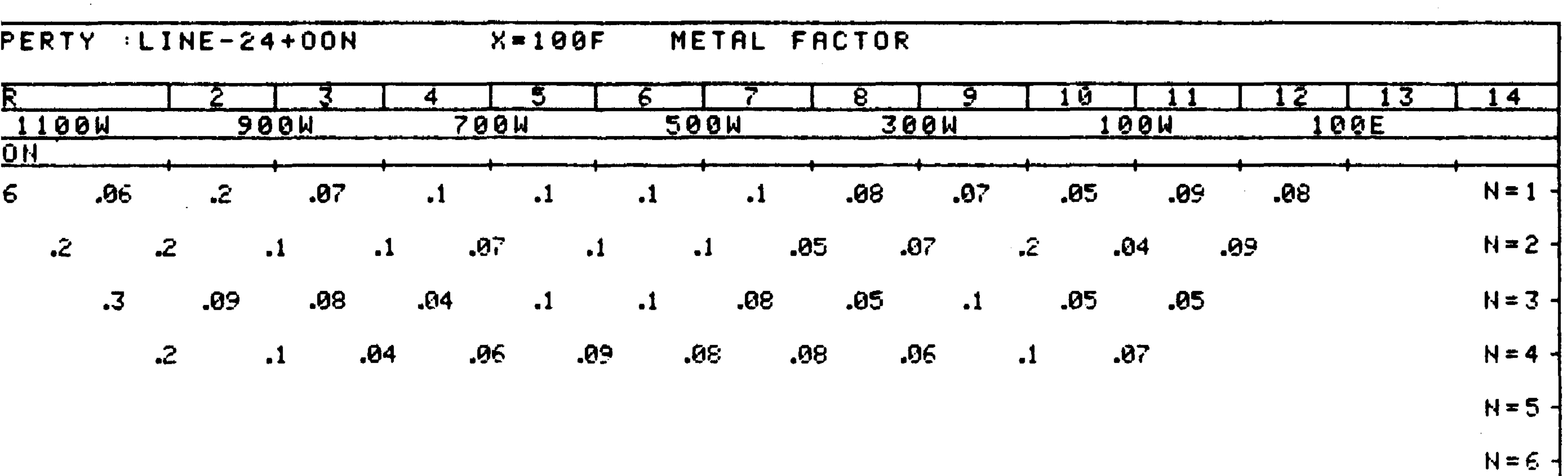

GOSSELIN PROPERTY : LINE-16+00N X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 8591 6087 6035 6151 5481 7054 5751 5566 4980 6211
N=2 13K 9350 7700 7695 9545 12K 19K 13K 20K 17K
N=3 16K 12K 8023 10K 10K 16K 15K 18K 19K 11K
N=4 19K 12K 9529 12K 14K 14K 20K 13K 11K
N=5
N=6


GOSSELIN PROPERTY : LINE-16+00N X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRET ?
N=1 5 8.3 4.5 4.2 7.9 4.5 6 4.8 8.2 5.7
N=2 10 9.7 6.8 8.5 12 13 13 12 5 11
N=3 12 12 7.5 11 10 11 11 9.9 11 10
N=4 13 14 9.1 8.2 9.7 11 9.3 11 11
N=5
N=6


GOSSELIN PROPERTY : LINE-16+00N X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11
COORDINATE 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 .06 .1 .07 .07 .1 .06 .1 .09 .2 .09
N=2 .08 .1 .09 .1 .1 .1 .07 .09 .02 .07
N=3 .07 .1 .09 .1 .1 .07 .07 .06 .05 .1
N=4 .07 .1 .1 .07 .07 .08 .05 .08 .1
N=5
N=6







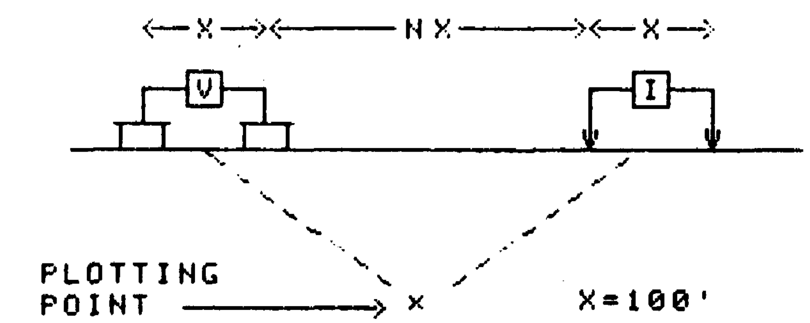
DWG. NO.-I.P.-5404-1

ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-24+00N



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

DATE SURVEYED MAY 1985

APPROVED

DATE

PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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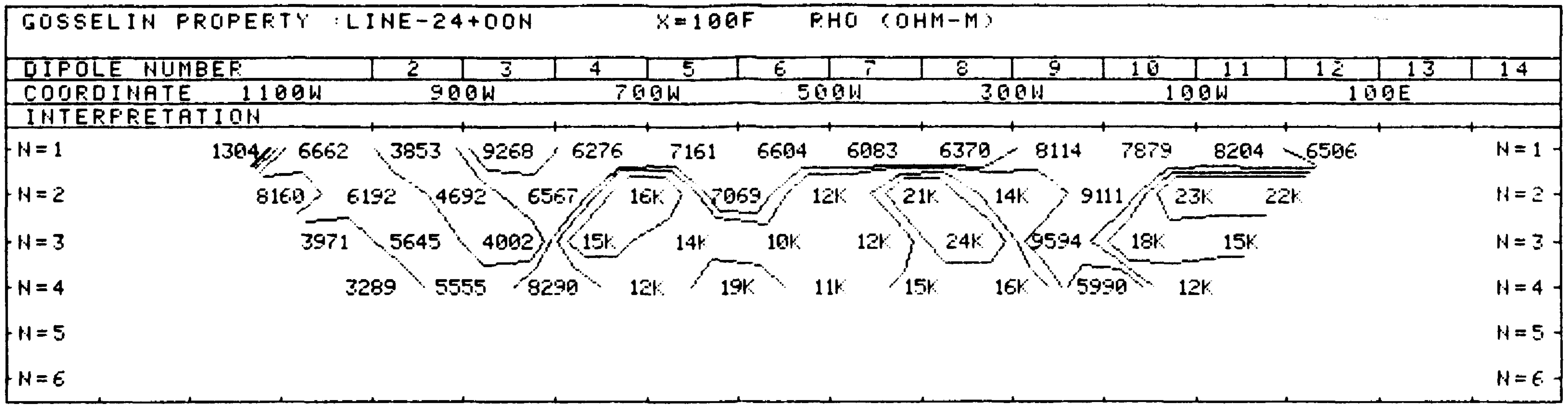
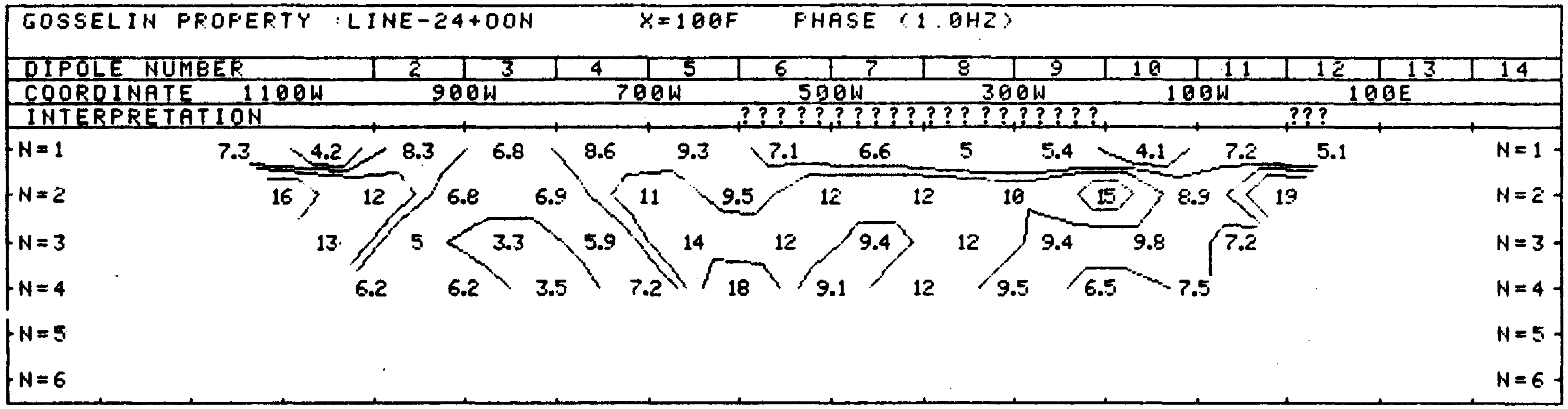
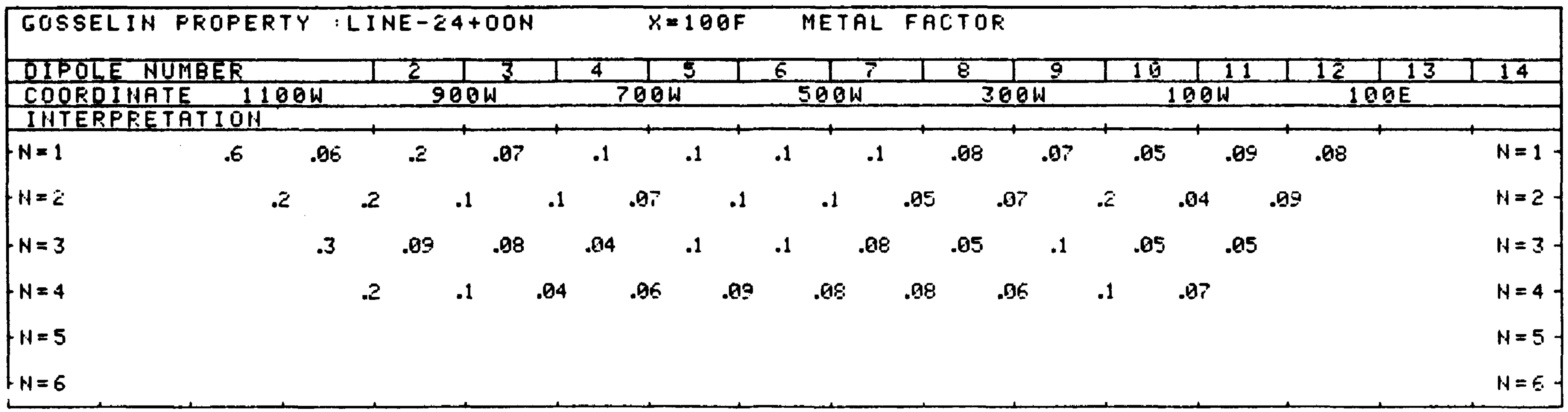
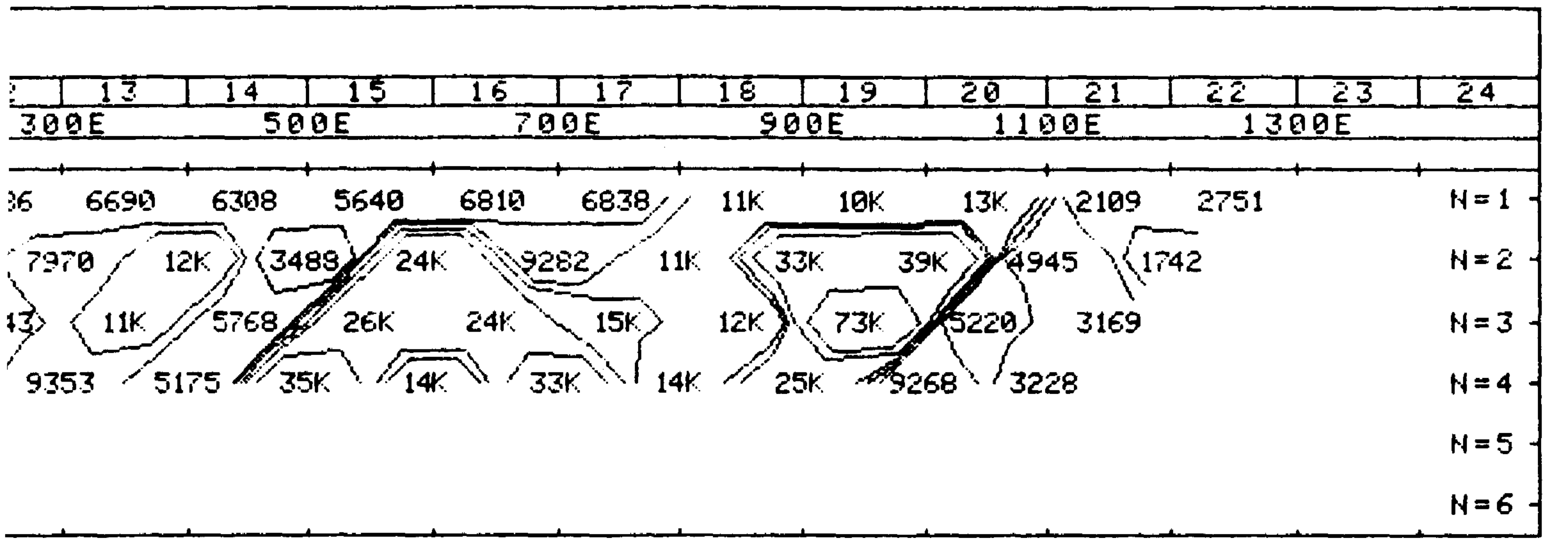
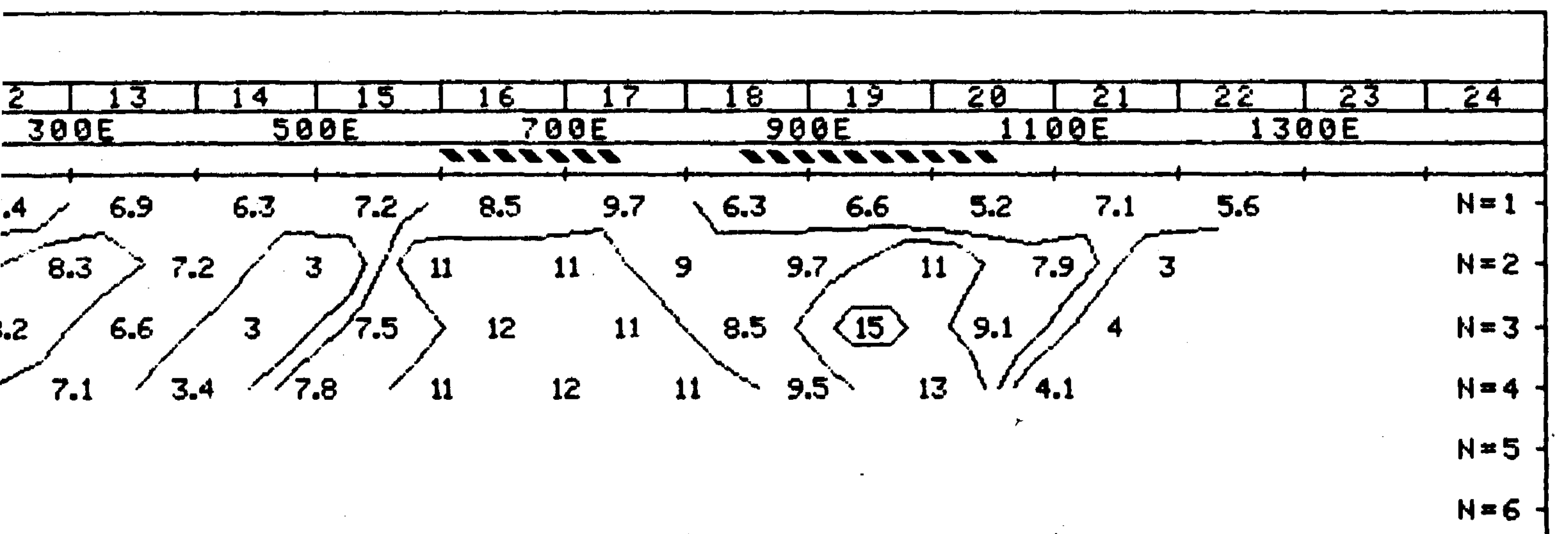

GOSSELIN PROPERTY :LINE-24+00N X=100F RHO (OHM-M)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 1100W 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 1304 6662 3853 9268 6276 7161 6604 6083 6370 8114 7879 8204 6506 N=1
N=2 8160 6192 4692 6567 16K 7069 12K 21K 14K 9111 23K 22K N=2
N=3 3971 5645 4002 15K 14K 10K 12K 24K 9594 18K 15K N=3
N=4 3289 5555 8290 12K 19K 11K 15K 16K 5990 12K N=4
N=5 N=5
N=6 N=6

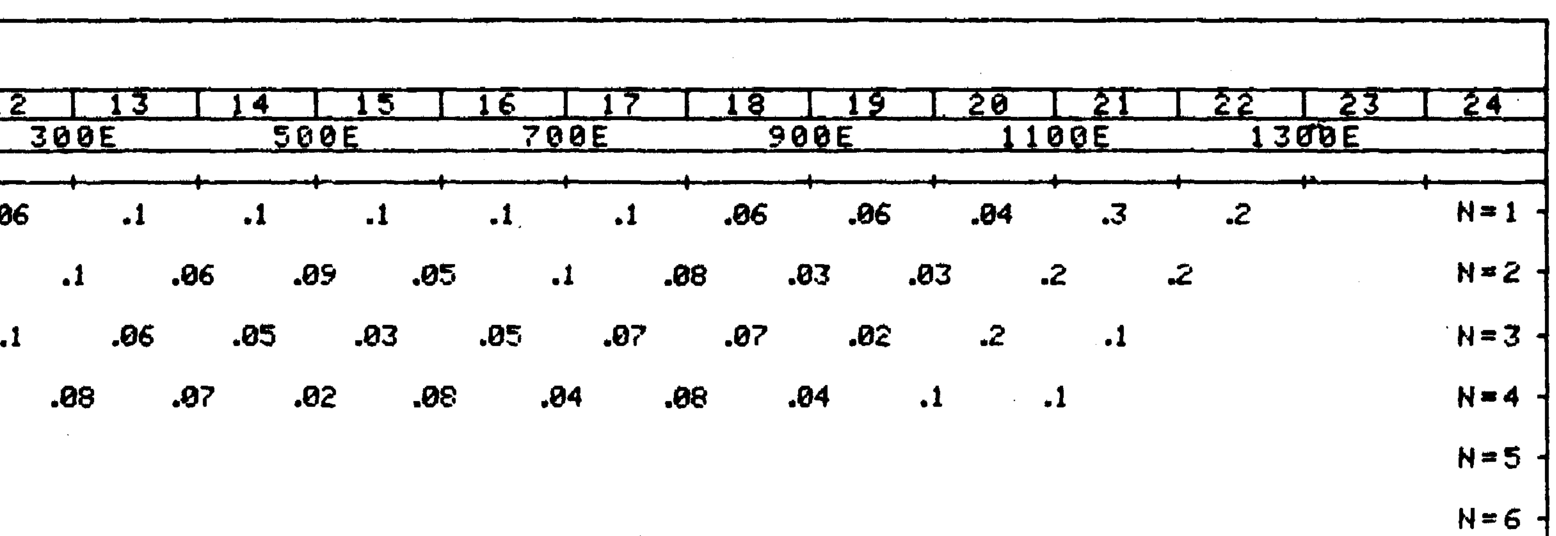

GOSSELIN PROPERTY :LINE-24+00N X=100F PHASE (1.0HZ)
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 1100W 900W 700W 500W 300W 100W 100E
INTERPRETATION ?????????????????????? ???
N=1 7.3 4.2 8.3 6.8 8.6 9.3 7.1 6.6 5 5.4 4.1 7.2 5.1 N=1
N=2 16 12 6.8 6.9 11 9.5 12 12 10 15 8.9 19 N=2
N=3 13 5 3.3 5.9 14 12 9.4 12 9.4 9.8 7.2 N=3
N=4 6.2 6.2 3.5 7.2 18 9.1 12 9.5 6.5 7.5 N=4
N=5 N=5
N=6 N=6


GOSSELIN PROPERTY :LINE-24+00N X=100F METAL FACTOR
DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14
COORDINATE 1100W 900W 700W 500W 300W 100W 100E
INTERPRETATION
N=1 .6 .06 .2 .07 .1 .1 .1 .1 .08 .07 .05 .09 .08 N=1
N=2 .2 .2 .1 .1 .07 .1 .1 .05 .07 .2 .04 .09 N=2
N=3 .3 .09 .08 .04 .1 .1 .08 .05 .1 .05 .05 N=3
N=4 .2 .1 .04 .06 .09 .08 .08 .06 .1 .07 N=4
N=5 N=5
N=6 N=6

DWG. NO.-I.P.-5404-2





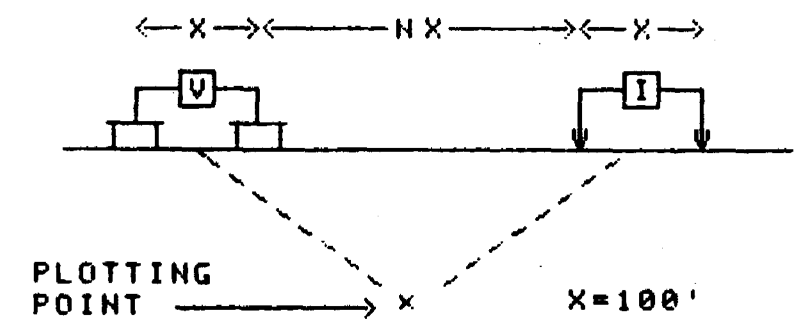


ONITAP RESOURCES INC.

GOSSELIN PROPERTY

SHINING TREE AREA / ONTARIO

LINE NO.-20+00N



SURFACE PROJECTION OF ANOMALOUS ZONE

DEFINITE
PROBABLE
POSSIBLE

FREQUENCY (HERTZ)
1.0 HZ.

NOTE- CONTOURS AT LOGARITHMIC INTERVALS. 1,-1.5 -2,-3,-5,-7.5,-10

DATE SURVEYED 1985
APPROVED
DATE

PHOENIX GEOPHYSICS LTD.

INDUCED POLARIZATION AND RESISTIVITY SURVEY

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GOSSELIN PROPERTY :LINE-20+00N X=100F RHO (OHM-M)

DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

COORDINATE 900W 700W 500W 300W 100W 100E 300E 500E 700E

INTERPRETATION

N=1	7922	6508	6402	6709	9340	7126	7424	6240	4693	5250	6829	7535	5686	6690	6308	5640	6810	6838
N=2	27K	17K	9737	7225	13K	9844	15K	7667	11K	16K	7289	7209	7970	12K	3488	24K	9282	11K
N=3	13K	19K	9553	8599	15K	17K	8338	11K	14K	16K	6540	7443	11K	5768	26K	24K	15K	
N=4	13K	17K	11K	10K	26K	9660	11K	14K	15K	13K	6708	9353	5175	35K	14K	33K	14K	
N=5																		
N=6																		

GOSSELIN PROPERTY :LINE-20+00N X=100F PHASE (1.0HZ)

DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

COORDINATE 900W 700W 500W 300W 100W 100E 300E 500E 700E

INTERPRETATION ??????????????????? ???

N=1	4.6	6.5	6.8	5.9	4.5	9.1	6.8	5.7	4.7	4.4	7.2	10	3.4	6.9	6.3	7.2	8.5	9.7
N=2	5.2	13	9.2	5	11	8.4	9.1	14	6.7	9.6	8.2	7.2	8.3	7.2	3	11	11	9
N=3	6.2	12	9.1	9.7	11	10	7.2	6.8	8.3	9.8	6.1	8.2	6.6	3	7.5	12	11	
N=4	5.5	12	12	8.3	13	8.8	5.8	9	8.8	7.7	7.5	7.1	3.4	7.8	11	12	11	
N=5																		
N=6																		

GOSSELIN PROPERTY :LINE-20+00N X=100F METAL FACTOR

DIPOLE NUMBER 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

COORDINATE 900W 700W 500W 300W 100W 100E 300E 500E 700E

INTERPRETATION

N=1	.06	.1	.1	.09	.05	.1	.09	.09	.1	.08	.1	.1	.06	.1	.1	.1	.1	.1
N=2	.02	.08	.09	.07	.08	.09	.06	.2	.06	.06	.1	.1	.1	.06	.09	.05	.1	.08
N=3	.05	.06	.1	.1	.07	.06	.09	.06	.06	.06	.09	.1	.06	.05	.03	.05	.07	
N=4	.04	.07	.1	.08	.05	.09	.05	.06	.06	.06	.1	.08	.07	.02	.08	.04	.08	
N=5																		
N=6																		

DESCRIPTIONS OF MISCELLANEOUS SAMPLES

Charles J. Kaiser

February 9th, 1985

* * *

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	Plan Map (in pocket)	Dwg. No. I.P.P. - 4139	

#63.4978

OM84-6-C-357

THIS SUBMITTAL CONSISTED OF VARIOUS REPORTS, SOME OF WHICH HAVE BEEN CULLED FROM THIS FILE. THE CULLED MATERIAL HAD BEEN PREVIOUSLY SUBMITTED UNDER THE FOLLOWING RECORD SERIES (THE DOCUMENTS CAN BE VIEWED IN THESE SERIES):

a) REPORT ON 1985 DIAMOND DRILLING PROGRAM - GOSSELIN CLAIMS, drill hole # S 85-1, 85-2 + 85-8, JAN-Feb/85, ONTAP RESOURCES → SEE ASQUITH TWP. D.D. REPORT # 27, REPORT OF WORK # 99 FOR 1985

b) REPORT ON 1985 DIAMOND DRILLING PROGRAM - OLA LAKE PROPERTY, drill hole # 85-3 to 85-7, Feb/85, ONTAP RESOURCES → SEE MIRAMICHI TWP. D.D. REPORT # 11, REPORT OF WORK # 98 FOR 1985

GENERALIZED GEOLOGICAL CROSS-SECTION

GOSSELIN PROPERTY

scale: 1" = 200'

OM 84-357

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