2.17340

REPORT ON

AN

I.P. ELECTROMAGNETIC SURVEY

AND

DIAMOND DRILLING PROGRAM

The 1996 Oliver Group/Canadian Zeolite Ltd.,
Joint Venture Project, McNeil Township, Ontario

Prepared By:

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January 3, 1997

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1.0 SUMMARY - This report contains the results of an I.P. geophysical survey, and a diamond drilling program, completed during the summer of 1996. A total 42 KM of picket lines, and 4.3 KM of base line were cut, within the North and South blocks, and I.P. coverage on 50 metre dipole spacing completed. Three geophysical anomalies were defined and subsequently explored by three diamond drill holes, each 400 feet in depth. Hole 96-3, located in the southeastern section of the South Block, intersected anomalous gold (up to 626 ppb) within a 27 foot wide, mineralized felsite dyke. A grab sample (96-1) selected from an outcrop located about 30 metres due west of this hole, assayed 0.16 ounces of gold/tonne, and appears to occur within the same gold bearing horizon. A program of future geological mapping, power stripping, and sampling in this area is highly recommended.

The so called TOM FOX LAKE NORTH BLOCK, located immediately north of the 1996 South Block has not been explored to date in any detail. A 1994 OGS geology map (P-3246) prepared by L.S. Jensen, indicates that gold values, located in a series of pits and shafts (drawing S 96-1), are associated with quartz veins (drawing S 96-1) cutting felsite dykes and basaltic volcanics. Detailed geophysical surveys (I.P. & Magnetic), also geological mapping and sampling are highly recommended for this unexplored area.

It is also recommended that geological and geophysical surveys (I.P. & Mag.) be completed over the so called SHERMAN LAKE EAST BLOCK. In addition, geological evaluation of the 1996 I.P. Anomaly (Line 11+00E/5+00 South---South Block) is recommended.

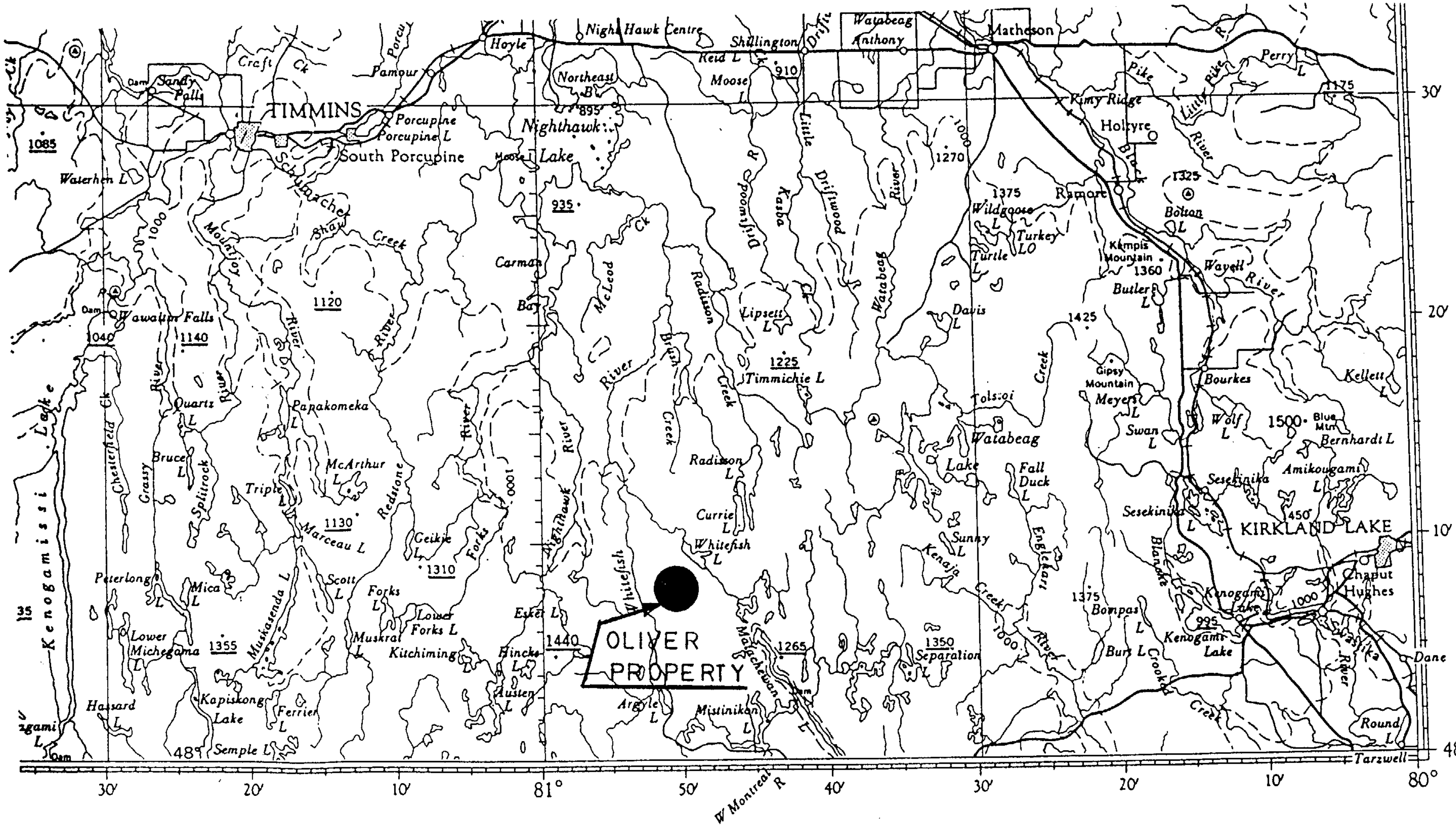
Estimated costs (page 9) for exploring the above four areas are included in the Phase I proposal, at a cost of $112,000. An estimate of follow-up exploration costs under Phase II & III ($110,000 and $138,300 respectively) is also presented.

2.0 BACKGROUND INFORMATION

The 1996 Oliver Group/Canadian Zeolite Project, is located in the southeast quadrant of McNeil Township, Ontario. Work consisted of line cutting, completion of an I.P. Electromagnetic survey, and the drilling of three diamond drill holes (400' each) to test I.P. anomalies.

This work followed recommendations contained in a January 11, 1996 Report by the writer on "The Oliver Gold Property, McNeil Township, Ontario.". All previous exploration did not involve the use of I.P. Electromagnetic surveys. Gold mineralization occurs in association with disseminated pyrite mineralization, adjacent quartz veining, within or close to felsic dykes which intrude mafic to intermediate volcanics.

The 1996 project was therefore planned around the completion of I.P. surveys, and follow up diamond drilling, designed to test overburden covered areas carrying disseminated pyrite.



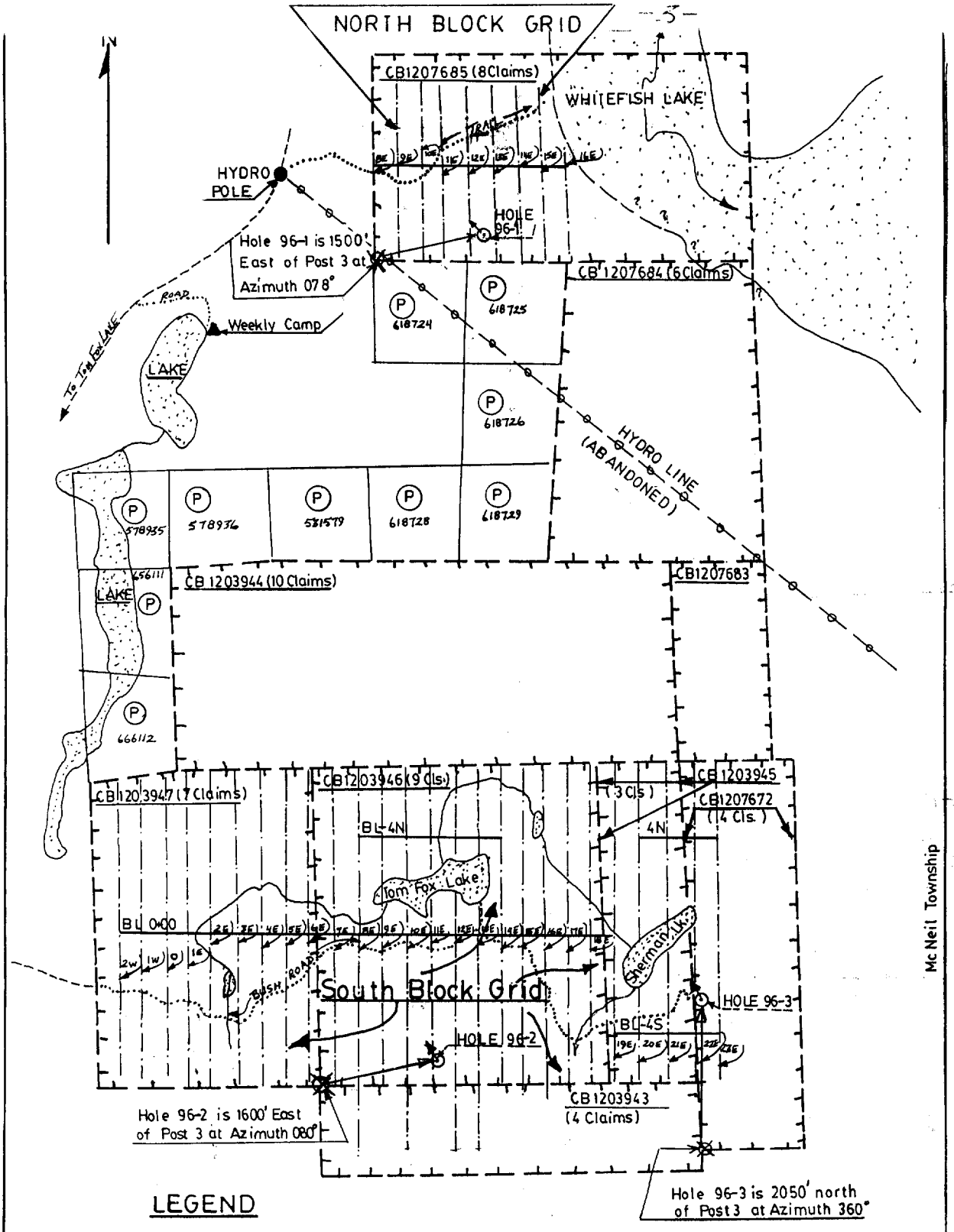
McNEIL PROJECT

LOCATION MAP

Figure 1

SCALE 1:500,000

FIG. 1



LEGEND

- CLAIM BLOCKS—THE OLIVER GROUP
- 1996 LINE GRIDS & IP GEOPHYSICAL COVERAGE
- (P) CLAIMS UNDER LEASE
- 1996 DIAMOND DRILL HOLE
- CLAIM BLOCK POST

PLAN (McNeil Twp. Ontario)

SHOWING CLAIM BLOCKS, GRID LINES, GEOPHYSICAL COVERAGE AND DIAMOND DRILL HOLES FOR THE 1996 OLIVER GROUP/CANADIAN ZEOLITE LTD. JOINT VENTURE

McNeil Township

SCALE

FEET 1000 2000 3000 4000 5000

200 400 600 800 1000 1200 1400

Argyle Township

Drawn: R.V. Stewart December, 1996

3.0 PROPERTY DESCRIPTION AND LOCATION

The property is located approximately 80 KM by road southeast of Timmins, and 60 KM by road west from Kirkland Lake, Ontario (Figure 1--page 2). It currently consists of 58 mineral claims contained within 9 Claim Blocks (Figure 2--page 3). The 1996 work was contained (in whole or in part) within the five South Claim Blocks 1203943, -45, -46, -47 & 1207672, and the North Claim Block 1207685. The location of the current line cutting, geophysical coverage, and diamond drilling is shown on Fig. 2, and drawing S 96-1..

4.0 COMMENTS -- 1996 I.P. ELECTROMAGNETIC SURVEY

Lines were cut (100 metre spacing), within the South, and North Block Grids, as shown on Figure 2, and I.P. Electromagnetic readings were completed along the grid lines.

The Grid Lines were cut by Dave Gibson & Associates, and the I.P. Survey was contracted to Walcer Geophysics Ltd.. Approximately 40 KM of I.P. coverage (50 Metre dipole spacing) was completed over the north and south blocks during August. In September, Walcer Geophysics Ltd. also completed two days of additional fill in I.P. coverage on 25 metre dipole spacing. This was completed over four lines (20E - 23E) in the southeast corner of the South Block, to better define the I.P. anomalies, on and between lines 20+00E to 23+00E.

The pseudo sections produced by Walcer Geophysics were submitted to Rod W. Woolham, Geophysicist, for his analysis and recommendations. Mr. Woolham's report is included as Appendix B in this report. He prepared contoured values of Polarization and Resistivity Values, and these maps are in the pocket at the end of his report. Following is a summary of the four Anomalous Responses outlined from the I.P. Survey, and as reported by Woolham:

Grid Location--Anomaly Centre

Block	Line	Lat.	Long.	Comments
North	12+00E	3+00S	0+50E	Woolham comments that this anomaly gave a "significant response and requires an explanation".
South	11+00E	5+00S	0+00E	This is the central point of a threshold anomaly- (> 15 mrad). Woolham comments that, "the extensive size of the anomaly suggests a large siliceous body containing pyrite". Stripping and diamond drilling were recommended.
South	20+00E	3+25S	0+00	The 50 metre dipole spacing survey indicated a definite polarization anomaly. Subsequent fill-in I.P. coverage on 25 metre dipole spacing indicated weaker polarization, and as a result it was decided not to drill test this one.
South	22+00E	2+50S	0+00	Woolham describes this as "a weak marginal anomaly"

5.0 SUMMARY COMMENTS ON THE 1996 DIAMOND DRILLING PROGRAM

5.1 Hole Locations

Hole No.	Block	Line	Lat.	Long.	Azimuth	Dip	Depth (feet)
96-1	North	12+00E	3+00S	12+50E	315	-45	400
96-2	South	11+00E	5+25S	11+20E	333	-45	400
96-3	South	22+00E	2+75S	22+30E	324	-45	400
						Total	1,200

5.2 Drilling Results (See Logs - Appendix A)

Hole 96-1 - Basaltic andesite (chloritic) volcanics, cut by a series of narrow quartz/carbonate veins and quartz veinlets. Fine disseminated pyrite/pyrrhotite mineralization (1%-5%) occurs throughout the first 280 feet. From 280 feet to the end of the hole, the sulphide content drops off to 1% or 2%, and the quartz carbonate veins give way to veins of epidote/quartz/carbonate composition. Assays of selected core samples yielded only low non economic gold values.

Hole 96-2 - Meta-Andesite, generally moderately silicified and carbonatized, cut by two felsite dykes (20 to 60 feet wide) and a number of narrow dykes of granodiorite, feldspar porphyry, and gabbroic composition. The felsite dykes, and to a lesser extent the altered meta-volcanics, are intersected by quartz, and quartz/carbonate or epidote/quartz carbonate veins and veinlets. Disseminated pyrite, (1% - 3%) occurs sporadically throughout, but is concentrated in the more silicified layers, especially adjacent quartz or quartz carbonate veins, within the two felsite dykes. Only trace amounts of anomalous gold were detected in core assay, generally adjacent quartz veins associated with the felsite dykes.

Hole 96-3 - Meta-Andesite, moderately fractured, intersected by three felsite dykes cut by white quartz veins and associated disseminated pyrite. The widest (27 foot) felsite dyke (136 - 163) is cut by a number of white quartz veins, and associated "cubic" pyrite. The bottom part of the hole from roughly 314' to the end, is mainly a mixture of variolitic flows. The above mentioned felsite dyke carries anomalous gold values, with the best section assaying 626 ppb over 2.0 feet. Additional exploration within and in the area of this auriferous dyke is definitely warranted. Recommendations are contained in section 6.3 of this report.

6.0 PRINCIPAL OBJECTIVES, CONCLUSIONS AND RECOMMENDATIONS -- 1996 PROJECT

6.1 OBJECTIVES

The main objective of the 1996 exploration program conducted on the Oliver Property, was to determine if exposed, east-west trending sulphide bearing felsite dykes and shear zones, also exist below overburden covered areas. Outcrop exposures on the property occupy about 20% of the area. Numerous anomalous gold values here are known to occur in association with east-west quartz vein/pyrite bearing felsite dykes, and also within north-south trending structures.

6.2 CONCLUSIONS

The I.P. survey was only partially successful in locating obscured sulphide bearing bedrock, as explained in the following comments:

* Hole 96-1-(North Block) was drilled to determine the source of a "significant I.P. Anomaly", as there were no outcrop exposures here. The first 200 feet of this hole intersected chloritic and andesitic basalt, carrying relatively consistent percentages (2%-5%) of fine disseminated pyrite/pyrrhotite mineralization. As shown on the Geological Section (drawing S 96-11), this drill hole coincides with the I.P. anomaly "high". The numerous quartz/carbonate veinlets intersected, and associated pyrite, unfortunately do not carry any significant amount of gold.

* Hole 96-2-(South Block) was drilled to test an "extensive I.P. anomaly" centred on line 11+00E at 5+00 South. This anomaly is about 150 metres wide, and extends in an east-northeast direction for some 500 metres. The hole intersected carbonatized and silicified intermediate volcanics, cut by a two felsite dykes (23 & 60 feet wide) and two or three narrow (2 to 3 feet wide) dykes of granodiorite or dioritic gabbro composition. Disseminated pyrite occurs sporadically throughout the hole, and in all of the rock types. It is interesting to note that the area contained within this anomaly is moderately silicified and carbonatized throughout, and was explored in the past by a minor amount of stripping (south dyke), and the completion in 1946, of a series of short diamond drill holes (dwg. S 96-11). This anomaly covers most of the altered volcanics, referred to in previous exploration as the south talc/carbonate gold showing. Rod Woolham comments that: "the extensive size of the anomaly suggests a large siliceous body containing disseminated pyrite". The I.P. survey therefore appears to have outlined the south talc/carbonate zone more accurately than was possible from geological mapping or past geophysical surveys. The 1946 diamond drilling, within this altered zone (between 1996 Lines 11+00 East and 12+00 East), intersected marginal gold values in association with narrow white quartz veinlets intersecting felsite dykes and altered intermediate to mafic volcanics. Two holes (86-1 & -4) were drilled by Argyle Venturtes Inc. in 1986, near the north edge of this altered zone. One 9 foot intersection in hole 86-4 yielded .6 grams Au/tonne over a 9 foot intersection. It is recommended that the area encompassing this zone (see enclosed drawing S 96-11), be reevaluated in more detail by geological mapping, surface sampling, and if warranted, power stripping and additional exploration.

* Hole 96-3-(South Block)

This hole was drilled into a marginal I.P. anomaly, approximately 30 metres east of an exposed and mineralized (pyritized) felsic dyke. A 1996 chip sample (#96-3) selected in this mineralized outcrop yielded an assay of 0.16 ounces per tonne Au (4.5 grams). Location of this hole is shown on drawings S 96-1, S 96-11 & S 96-14. It intersected a 27 foot wide felsite dyke, cut by narrow quartz and quartz/carbonate veins carrying anomalous gold (up to 626 ppb). It appears that these values line up along strike with the above .16 opt Au chip sample. The marginal anomaly into which this hole was drilled, may or may not have been the source of the disseminated pyrite crystals and "wispey sulphide material" which coats fractures planes in the siliceous portions of the dyke.

6.3 RECOMMENDATIONS---ADDITIONAL EXPLORATION

There are at least three areas within the present Oliver Property which require additional follow-up or extended exploration work. These areas are as follows:

Area A - Sherman Lake (Priority 1)--The 1996 exploration determined that the area located south and southeast of Sherman Lake (south block) definitely warrants further exploration. The area of prime interest is shown outlined in yellow color on drawings S 96-1, and 96-11. The positive assay results (anomalous gold) from core analysis of Hole 96-3, plus work completed by Manville Canada Inc. (1983-85), indicates the area should be remapped geologically, stripped using power equipment, old trenches located, then exposed outcrops washed and sampled. The writer completed a reconnaissance of this area in 1996, and numerous old trenches were noted. It appears that previous exploration here consisted mainly of geological mapping, geophysical magnetic surveys, and the blasting of numerous trenches containing disseminated sulphides (pyrite/chalcopyrite). Trenches appear to have been excavated in rocks favourable for gold deposition ie. east/northeast trending felsite dykes, quartz/carbonate alteration zones, and green colored fuschite carbonate zones. The trenches were sporadically located, and bedrock between trenches were not exposed, even though there appears to be a continuation of the favourable geology along strike.

A 1996 I.P. (marginal) anomaly located at about 3+30 south--Line 20+00E, should also be stripped, as it appears to line up with the felsite dyke intersected in hole 96-3.

The proposed areas for "power stripping" are shown on drawing S 96-11, and are part of the proposed Phase I program, as described in Section 8.0 of this report. Geological mapping should first be completed, followed by a magnetic survey to more accurately determine rock contacts, and north-south trending structures. The mapping and magnetic survey results, will define more accurately where power stripping and sampling should be carried out. Previous magnetic surveys indicated the existence of a major north-south structure cutting present line 23+00 E at about the base line (0+00). The intersection location of the east-northeast trending felsite dykes and this north-northwest trending

structure would be a definite exploration target. The above proposal for additional work is covered under Phase I - Cost Estimates, 1997 Program Recommendations. If encouraging results are obtained under Phase I, additional stripping and diamond drilling should be completed (Phases II and III), if justified by each of the foregoing Phases.

Area B - Tom Fox Lake North & Sherman Lake East Blocks (Priority 1)--

TOM FOX LAKE NORTH BLOCK

The Tom Fox Lake North Block is an area approximately 2.4 KM long and 0.8 KM wide, and is located immediately north and parallel to the north boundary of the 1996 I.P. Survey Area (dwg. S 96-1). The areas immediately north and south of this block were explored in the 1940's and 1980's, but this Block was never properly evaluated. From 1984 to 1988, Argyle Ventures Inc, Manville Canada Inc, Chutine Resources Inc, and Kerr Addison Mines Ltd., carried out geological and geophysical surveys in this southeastern quadrant of McNeil Township. The Tom Fox Lake North Block was held by Mervin King, prospector; and during that period, was not explored. In 1994, a government geological map (Map P.3246) compiled by L.S. Jensen, shows an area of exposed outcrop composed of mafic volcanics cut by felsite dykes, and exposed over a strike length of 0.4 KM. A series of old pits and trenches, and a shaft are shown on Jensen's map, with an indication that anomalous gold occurs in some of the old workings.

It is therefore recommended that this block be explored in 1997; ie. line cutting, geological mapping/sampling, and I.P. geophysical surveys. It appears from Mr. Jensens map that much of the remaining Block Area is devoid of exposed outcrops. The geological mapping will tie in outcrops to the existing and planned grid, and the recommended I.P. survey will define potential hidden sulphide bearing or highly altered and silicified zones, favourable for gold deposition. This proposed exploration is covered under Phase I, page 9.

SHERMAN LAKE EAST BLOCK

The 1996 drilling south of Sherman Lake has defined the location of at least one gold bearing felsite dyke. Past exploration results indicate the existence of favourable rock and geological structures for gold deposition in the area. It is therefore recommended that 10 additional mineral claims be staked immediately east of the present Claim Blocks 12078672 & 1207683, as shown on drawing S 96-1. The 1996 Control Grid should be continued eastward to cover these recommended staking areas. Geological mapping and an I.P. Geophysical Survey is recommended to evaluate the eastern extension of the felsite dykes and quartz/carbonate alteration zones. This is part of the recommended 1997 Phase I program, page 9.

AREA C--I.P. ANOMALY--Line 9E to 13E (5+00 South) Area--Priority 2

As previously indicated, this 1996 anomaly area (dwg. S 96-11) should be remapped geologically, and mineralized outcrop areas sampled and assayed.

It was generally explored in 1946 and 1985-88, but the 1996 I.P. results indicate a broader area of potentially favourable rock for gold deposition than previously indicated. Further possible diamond drilling will depend on the geological evaluation and sampling results. This area is also part of the Phase I program, page 9.

8.0 COST ESTIMATES --- 1997 PROGRAM RECOMMENDATIONS

Phase I: Staking, Line Cutting, I.P. Surveys, Geological Mapping & Sampling, Power Stripping & Sampling.

	Estimated Costs
Staking:(Two Claim Blocks)--12 claims @ $100....	$ 1,200
Line Cutting: 41 KM @ $378/KM.....	$ 15,500
Geological Mapping/Sampling	$ 29,500
Mechanical Stripping & Washing.....	$ 20,500
I.P. Electromagnetic Survey--41KM @ 730/KM.....	$ 29,300
Magnetic Survey--41KM @ $730/KM.....	$ 6,000
Sub Total	$ 102,000
Plus 10% Contingency	10,200
Total	$ 112,200

NB. Results of the Phase I Program should be studied and evaluated before proceeding to Phase II.

Phase II: (Follow-up to Phase I Exploration - If justified)

Mechanical Stripping/Washing--15 days	$ 30,750
Geological Mapping/ Sampling/Assaying --15 days ..	$ 13,525
Diamond Drilling--2200 feet @ $25.00/foot.....	$ 55,725
Sub Total	$ 100,000
Plus 10% Contingency	$ 10,000
Total	$ 110,000

NB. Results of the Phase II Program should be studied and evaluated before proceeding to Phase III.

Phase III: (Follow-up to Phase I & II Exploration - If justified)

Diamond Drilling--5000' @ $20.00/foot.....	$ 100,000
Geological Mapping/Sampling	$ 25,800
Sub Total	$ 125,800
Plus 10% Contingency	$ 12,580
Total	$ 138,380

Total Phase I....$112,000
Total Phase II...$110,000
Total Phase III..$138,380
TOTALS $360,380

CERTIFICATION

I Ralph V. Stewart of 244 Keewatin St. S., Oshawa, Ontario hereby certify as follows:

1. I am a registered member of the Association of Professional Geologists of Alberta.

2. I am a graduate of Mount Allison University, with a B.Sc. degree in Geology.

3. I have practised my profession continuously over the last 35 years, as an Exploration, Production, and Consulting Geologist.

4. I have no interest directly or indirectly in the Oliver Property.

5. The information in this report is based on sources sited in the bibliography, and from field exploration conducted over most of the property in 1984, -85 & -86, and during the 1996 program.

6. I consent to the use of this report in a Prospectus or statement of material facts.

Respectively Submitted

Ralph V. Stewart, P.Geol
January 3, 1997

BIBLIOGRAPHY

TECHNICAL DATA AVAILABLE---McNeil Township "Oliver Property"

Report No. & Date	Report.... Title With Details
1-June 3, 7, 8, 1946.	Reports On Goldyke Mines Ltd., by Nelson Hogg, B.M. Arnott, & F.H. Jowsey.
2-February, 1982 & 2A- April, 1983	Report On Magnetic Survey (BOJO Claims). By F.J. Evelegh Report On Geophysical Surveys (BOJO Claims), By F.J. Evelegh.
3 -August, 1983	Geological Report On McNeil Twp. Property for Argyle Ventures Inc., By John R. Boissoneault
4- October, 1983	"Report On McNeil Township Property Of Argyle Ventures Inc.", by Terry McKillen for Westfield Minerals.
4A- March, 1984	"Geophysical Survey Report On The McNeil Property", By Mary Greer.
5-September, 1984	"Geological Report on Tom Fox Lake Property in McNeil Township, Larder Lake Mining Division, Ontario for Argyle Ventures Inc.". By Ralph V. Stewart
6-November, 1984	"Summary Report On Claim Holdings Of Manville Canada, Inc., N. Ont..Report" by J.J. Evelegh.
7-March, 1985	"Geological Report on The Whitefish Lake Property in McNeil Township, Larder Lake Mining Division, Ontario for Fairland Resources Limited", by R.V. Stewart.
8-November, 1985	"Geophysical and Geological Report on The Whitefish Lake Property in McNeil Township, for Fairland Resources Limited", by R.V. Stewart.
9-February, 1986	"Report on Geological Survey, BOJO Group of Claims, McNeil Township, Province Of Ontario", by F.J. Evelegh.

BIBLIOGRAPHY-Cont.

Report No. & Date	Report Title With Details
10-July, 1986	"Geological & Geophysical Report on Whitefish Lake Property" for Fairland Development Corp., by R.V. Stewart.
11-February, 1987	"Report On A Diamond Drilling And Stripping Program For Argyle Ventures Inc.", by R.V. Stewart
12-August, 1987	"Kerr Addison Mines Ltd, Geological Mapping McNeil Township, Ontario", by Mark Lewis.
13-February, 1988	"Geophysical Report...Magnetic and Electromagnetic VLF Surveys, Kerr Addison Inc., McNeil Township". (6 Maps In 2 Separate rolls).
14-March, 1988	"Kerr Addison Mines Ltd., Geological Mapping, McNeil Township" by Mark Lewis on A. Tom Fox Lake Cls., B. Diamond Drill Logs...4 holes drilled on Tom Fox/Manville Claim C. A plan of the grid cut over the Argyle and adjoining ground.
15-May, 1988	"Summary Report Of Mineral Exploration Activities...Manville Claims, McNeil Township", by F.W. Nielsen.
16-September, 1988	"Diamond Drilling Program, Summer, 1988 McNeil Property, McNeil Township Project" by P.T. Coyle.
17-December, 1992	"Geology of McNeil and Robertson Townships, District of Timiskaming"-- OGS Report by L.S. Jensen (ODM Miscellaneous Paper 160).

CLAIM HOLDERS & SURVEY SUPERVISORS (Names & Addresses)

1.0 Current Claim Holders (May, 1997):

Name	% Ownership
John H. Oliver 4222 6th. Ave. R.R. 2, Peachland, B.C. V0H 1X0	50%
Winnifred Oliver 200 Gladman Ave. London, Ontario N6J 1X5	25%
Gail Oliver 200 Gladman Ave. London, Ontario N6J 1X5	25%

Names & Addresses--1996 Program Supervisors

Name(s)	Program	Addresses
Ralph V. Stewart	Overall Supervision	244 Keewatin St. S. Oshawa, Ontario L1H 6Z8
David Gibson	Line Cutting Contractor	6 Stanhope St., Box 265 Warren, Ontario P0H 2N0
Alex Walcer	I.P. Geophysical Survey	2106 Regional Road 3 Enniskillen, Ontario L0B 1J0
Jocelyn Laporte	Major Domonik Drilling	1080 Rue Echo Val D'Or, Quebec J9P 4P3

Hole Location:-Claim Block No. 1207685
Core Size: BQ
Drilling Contractor: Forage Major Dominik

DIAMOND DRILL RECORD

NAME OF PROPERTY: Oliver Group-McNeil Twp.
HOLE NO. 96-1 LENGTH 400'
LOCATION 1996 Grid-(North Block)--Line 12+00E
LATITUDE 3+00S DEPARTURE 0+50E
ELEVATION ____ AZIMUTH 315 DIP -45
STARTED Oct. 13/96 FINISHED Oct. 14/96

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH
0	-45				
400	-35				

HOLE NO. 96-1 SHEET NO. 1
REMARKS

Ralph V. Stewart
LOGGED BY Ralph Stewart
LOG COMPLETED October 19, 1996

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	Au oz/t.	Cu ppm	Zn ppm
				%							
0	10	Casing									
10	82	Green colored, fine grained andesitic basalt (chloritic), cut by narrow (1/32"-1/8" thick) white quartz carbonate stringers, and gray colored quartz (1/16" thick) stringers. Minor "streaks" of fine grained pyrite/ pyrrhotite coated faces paralell to the moderate schistosity @ 40 degrees to the core axis. The narrow quartz carbonate stringers give a somewhat "laminated" appearance.									
		10' - 25'..Brown oxidized fracture planes with minor streaks of pyrrhotite/ pyrite mineralization.									
		25' - 29'.Very fine grained disseminated streaks of pyrrhotite/pyrite mineralization.	MC 96-1	2.5	26.3	28.3	2.0	1	NA	179	20
		41.3 - 43.3.More silicified w/10%-15% quartz carbonate veinlets w/ 5% pyrite/pyrrhotite	MC 96-2	3.5	41.3	43.3	2.0	8	N/A	107	45
		55.3 - 57.0.Contains fine banded stringers of quartz w/ pyrrhotite. -schistose @ 45 to core axis	MC 96-3	3.0	55.3	57.0	1.7	13	N/A	125	133

A1

DIAMOND DRILL RECORD

NAME OF PROPERTY: Oliver Group--McNei_ Twp.

HOLE NO. 96-1 SHEET NO. 2

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	ASSAYS Au oz/t.	ASSAYS Cu ppm	ASSAYS Zn ppm
				o/o							
10	82	Cont.									
		76.5 - 78.5. Pyrrhotite streaks smeared along schistose faces @ 45 degrees to core axis---also minor pyrite interlayered with pyrrhotite locally..	MC 96 -4	3.5	76.5	78.5	2.0	8	N/A	147	20
82	120	Green colored, chloritic meta-andesite cut by 35% white to gray colored, quartz carb. veinlets @ 45 degrees to core axis. Locally the meta-andesite varies in color from light to dark green with quartz carb. veins gray to white in color occuring as 1/16" - 1/4" wide bands. Sulphides are made up of 65% pyrrhotite, and 35% pyrite.									
		100 - 102. Banded gray/green colored rock with quartz veins and layers plus disseminated pyrrhotite/ pyrite "wisps" @ 45 degrees to core axis.	MC 96- -5	2.0	100	102	2.0	5	N/A	101	89
		112 - 114. Similar to above except sulphides are associated with quartz/carb. veinlets.	MC 96 -6	3.0	112	114	2.0	4	N/A	156	37
120	131	Green colored chloritic andesite but with only minor narrow quartz/carb. veins									
131	150	Dark green "varolitic" meta-basalt, or tuff breccia layer with fine disseminated pyrite cubes(1%).	MC 96 -7	2.0	133.4	134.4	1.0	2	N/A	39	48
		133.4 - 134.4-Fine grained, brownish gray colored felsic unit w/pyrite.									
		138 - 150. 1%-2% gray quartz veins (1/8"-1/4") with minor pyrite.									

DIAMOND DRILL RECORD

NAME OF PROPERTY Oliver Group--McNeil Twp.

HOLE NO. 96-1 SHEET NO. 3

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	Au oz/t.	Cu ppm	Zn ppm
				o/o							
150	173	Dark green meta-basalt, with an increase in fine disseminated pyrite (5%).									
		156.4 - 157.9. 1" - 2" wide white quartz veins with 3% disseminated pyrite @ 20 deg. to core axis	MC 96-8	3	156.9	157.9	1.0	3	N/A	199	30
		160 - 162.-Massive meta-basalt with 5% disseminated pyrite.	MC 96-9	5	160	162	2.0	4	N/A	115	35
		170 - 173.- Rock as above cut by a few gray colored quartz veins @ 45 deg. to core axis.									
173	282	Dark green colored andesitic basalt, cut by narrow (1/8"-1" wide) pale green colored quartz carb. veins at 45 deg. to core axis. These veinlets carry 3% disseminated pyrite The green color of veins is due to the development of epidote. Sample 96-12, was selected to determine if gold or base metal minerals are present.	MC 96-10	1	173.3	174.3	1.0	9	N/A	44	17
			MC 96-11	1.5	212.6	213.9	1.3	7	N/A	79	41
		235.8 - 236.5.-Fractured zone with 2" qtz. vein w/ 3% associated pyrite--not sampled.	MC 96-12	3	220 225.8	220.5 226.8	1.0	2	N/A	687	15
		237.5 - 266.-Notable decrease in number of mineralized quartz carb. veins.									
		266 - 269.- Diabasic flow with one or two narrow quartz carb. layers.									
		269.8 - 272.6.-Fractured @ 45 deg. to core axis, with the injection of narrow quartz carb. veinlets, carrying 1.5% disseminated pyrite/pyrrhotite--Drag folding evident.									
		272.6 6 276.-Fractured rock with the injection of very narrow quartz veins.									

DIAMOND DRILL RECORD

NAME OF PROPERTY Oliver Group--McNe.. Twp.

HOLE NO. 96-1 SHEET NO. 4

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	ASSAYS Au oz/t.	ASSAYS Cu ppm	ASSAYS Zn ppm
				%							
282	400	Green colored andesitic basalt, with 1/4"-2" wide epidote and quartz carb. lenses @ 40 degrees to core axis. Notable decrease in % of disseminated sulphides associated with the veins and lenses (compared to those noted between 172 - 282. Most of the epidote/quartz injections are devoid of fine sulphides. Locally the basalt is fractured and mildly sheared. The epidote and quartz injections are spaced on average 12" - 20" apart.									
		Pale green colored epidote/ quartz veins noted as follows: At 286.5', 288.2', 291', 299.5', 301.7', 305.8', 308', 311', 311.5', 314.4', 318', 319.7', 329', 354', 360.7', 361.2', 369.5', 381.3', 387.6'.									
		313 - 316.-Minor pyrite infilling along silicified fractures, and adjacent glassy quartz veins--fractured and sheared.									
		337 - 339.-Pink colored carbonate veins-1/2" at 10 degrees to core axis.									
		342.5 & 345.5.-Schistose meta-basalt with 30% narrow (1/4") gray colored siliceous stringers (no sulphides) @ 45 degrees to core axis.									
		381 - 381.6.-Minor chalcopyrite specks associated with green colored epidote/ quartz veinlets.									
		392.6.-1/2" quartz vein with specks of chalcopyrite.									
		395 & 398.5.-Trace of chalcopyrite with narrow green colored epidote/quartz veinlets.									
		END HOLE									

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Hole Location-Claim Block No..1203946
Core ze: BQ
Drilling Contractor: Forage Major Dominik

DIAMOND DRILL RECORD

NAME OF PROPERTY Oliver Group-McNeil Twp.
HOLE NO. 96-2 LENGTH 400'
LOCATION 1996 Grid-(South Block)--Line 11+00E
LATITUDE 5+25S DEPARTURE 11+20E
ELEVATION ____ AZIMUTH 333 DIP -45
STARTED Oct.16/96 FINISHED Oct. 17/96

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH
0	-45				
400	-37				

HOLE NO. 96-2 SHEET NO. 1
REMARKS ____

Ralph V. Stewart
LOGGED BY Ralph Stewart
LOG COMPLETED October 21,1996

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	ASSAYS Au oz/t.	ASSAYS Cu ppm	ASSAYS Zn ppm
				%							
0	14	Casing									
14	50	Medium green colored meta-andesite, cut by quartz/carbonate veins (1/16") @ 50 degrees to core axis. Andesite is carbonatized throughout. 14 - 35.-Moderately massive rock with fine disseminated pyrite(1%) & 5% quartz carbonate veining. 35 - 50.-Moderately sheared rock with an increase in fine disseminated pyrite (2%), adjacent narrow quartz/carb. veinlets. 48 - 50.-Increase in % of disseminated pyrite cubes (6%), sheared with fine quartz/carbonate veining.	MC 96-14	6	48	50	2.0	19	N/A	120	92
50	57.3	Pinkish green color, fine grained feldspar /quartz porphyry dyke, with 1%-4% fine grained pyrite cubes, and trace of minor white quartz carbonate veining. 53 - 55.-Typical sample with 2% fine pyrite	MC 96-15	4	53	55	2.0	1	N/A	58	40
57.3	75	Medium green colored meta-andesite cut by hairline white quartz & epidote stringers at 60 degrees to core axis.									

DIAMOND DRILL RECORD

NAME OF PROPERTY _____

HOLE NO. 96-2 SHEET NO. 2

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	Au oz/t.	Cu ppm	Zn ppm
				o/o							
57.3	75	Cont.									
		70 - 71.5.- Typical section with 3 or 4 narrow quartz veins (1/8") and minor disseminated sulphides.	MC 96-16	1	70	71.5	1.5	6	N/A	144	61
75	80	Fine grained, meta-dioritic gabbro dyke- massive but negligible sulphides.									
80	124	Medium green colored meta-andesite, mildly carbonatized, massive, and cut by hairline and narrow quartz, and quartz/epidote veinlets to 124'. Minor % of pyrite cubes associated with these veinlets(ie at 110, 115.5 & 119).									
124	147.5	Brownish gray colored, felsite dyke, very silicified, and fine grained. Narrow (1/32) green coated fractures @ 45 degrees to core axis. Minor fine grained pyrite associated with some of these fractures. A few wider quartz veins with an increase in pyrite at 140.5 - 141.5. The contact zone at 123.5 6 125.7 contains a concentration of fine pyrite cubes.	MC 96-17	2	123.5	125.7	2.1	12	N/A	16	36
			MC 96-18	2.5	139.3	142	2.5	18	N/A	6	39
		139 - 142.- Increase in % pyrite associated with a few 1/4" wide quartz veins, and green colored fractures.									
147.5	165	Medium green colored meta-andesite, mildly carbonatized and cut by 1/16" wide white colored carbonate lenses.									
		161 6 162.- Typical section with fine disseminated pyrite cubes.	MC 96-19	2	161	162	1.0	2	N/A	93	56

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DIAMOND DRILL RECORD

NAME OF PROPERTY _____

HOLE NO. 96-2 SHEET NO. 3

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	ASSAYS Au oz/t.	ASSAYS Cu ppm	ASSAYS Zn ppm
				o/o							
165	225	Light to medium gray colored felsite dyke, mildly to moderately carbonatized throughout and cut by a few quartz veins (1/4" - 1/2" -thick) at 45 degrees to core axis. Most of the rock is very fine grained with narrow layers of medium grained texture. Rock is generally massive.									
		184.5 - 187.3.-Fine grained, massive, with green coated fractures and very fine grained pyrite.	MC 96-20	1	184.5	187.3	2.8	8	N/A	92	45
		192.3 - 196.3.-Rock cut by 6 or 7 white quartz veins with associated fine pyrite and at 40 degrees to core axis.	MC 96-21	2	192.3	196.3	4.0	4	N/A	77	48
		202 - 204.2.-Similar to above sample, but cut by green colored fracture planes with fine grained disseminated pyrite, also cut by 3 quartz veins 1" thick.	MC 96-22	1.5	202	204.2	2.2	47	N/A	49	54
		219.4 - 221.2.-Similar to sample MC 96-22.	MC 96-23	1.8	219.4	221.2	1.8	4	N/A	75	54
225	235	Fine grained granodiorite dyke (massive to 230', and gray colored felsite dyke from 230' to 235'. The felsite is fractured with fine disseminated pyrite, and also cut by 2 to 3 quartz veins, 1" - 2" wide, but with negligible sulphides, Sample MC 96-24 was selected to check for free gold but this proved negative.	MC 96-24	1	226.6	227.1	0.5	16	N/A	75	54
235	244	Gray colored, medium grained meta andesite, carbonatized, and cut by a few quartz carb. veins at 40 degrees to core axis.									

AZ

DIAMOND DRILL RECORD

NAME OF PROPERTY _____

HOLE NO. 96-2 SHEET NO. 4

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	ASSAYS Au oz/t.	ASSAYS Cu ppm	ASSAYS Zn ppm
				o/o							
244	268	Gray to dark green colored (mottled) meta-andesite, cut by 5% white quartz carb. veinlets (hairline-1/4" wide) at 45 degrees to core axis. At 265-268, the rock is fractured along epidote faces, which carry 2% (sporadic) disseminated pyrite.	MC 96-24A	3	255	257.5	2.5	13	N/A	126	76
			MC 96-25	3	266.8	268	1.2	2	N/A	122	81
268	270	Grayish maroon colored, very fine grained granodiorite, with fine grained pyrite near contact at 270'.									
270	327	Pale to dark green meta-andesite, fine grained intruded sporadically by gray colored quartz, and white quartz carb. veinlets(1/32"-1/4" wide). Disseminated pyrite occurs throughout in small amounts, but adjacent quartz veins cubic pyrite increases to 4%. The dark and lighter colored green gives a "blotchy" appearance to the core.	MC 96-26	4	270	271	1.0	6	N/A	148	84
			MC 96-27	3.5	280.4	282.2	1.8	5	N/A	160	
			MC 96-28	2.5	291	293	2.0	3	N/A	111	63
			MC 96-29	2.0	294.5	296.9	2.4	3	N/A	151	73
			MC 96-30	1.8	298.8	300.6	1.8	3	N/A	108	100
			MC 96-31	2.0	306.6	308.7	2.1	4	N/A	156	76
			MC 96-31A	2.0	310.5	312.9	2.1	2	N/A	126	70

DIAMOND DRILL RECORD

NAME OF PROPERTY

HOLE NO. 96-2 SHEET NO. 5

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	Au oz/t.	Cu ppm	Zn ppm
				o/o							
270	327	Cont.. 325.6 - 327.- Rock cut by narrow gray colored quartz veins (stringers) with 1/8" pyrite cubes.	MC 96-32	2	325.6	327	1.4	8	N/A	104	69
327	336	Grayish maroon colored, fine grained grano-diorite dyke, fine to medium grained-massive. Cut by a few 1/4" quartz veins.	MC 96-33	3	327	330	3.0	1	N/A	18	44
			MC 96-34	2	334.8	336.0	1.2	2	N/A	113	59
336	361	Grayish green colored meta-andesite, carbonatized, and cut by a few 1/4" wide quartz veins and accompanying pyrite cubes.	MC 96-34A	1	350	351.6	1.6	2	N/A	108	67
361	371	Grayish maroon colored grano diorite or lamprophyry dyke, cut by quartz carb. veinlets at 365-366 feet.	MC 96-35	2	362	363.5	1.5	3	N/A	78	36
		362 - 363.5.-Fine grained pyrite cubes (disseminated)									
371	389	Similar to 361-371, but appears to be a contact zone between the meta-andesite and dyke rock. Rock is cut by a few quartz carbonate veinlets.	MC 96-36	3	392.3	394.3	2.0	20	N/A	125	60
389	400	Dark green colored meta-andesite, cut by 3%, 1/16" wide white quartz carb veinlets, and finely disseminated pyrite.	MC 96-37	3	396	397.6	1.6	4	N/A	134	66
		END HOLE									

Hole Location:-Claim Block 1207672
Core Size: BQ
Drilling Contractor: Forage Major Dominik

DIAMOND DRILL RECORD

NAME OF PROPERTY: Oliver Group-McNeil Twp.
HOLE NO. 96-3 LENGTH 400'
LOCATION 1996 Grid-(South Block)-- Line 22+00E
LATITUDE 2+75S DEPARTURE 22+30East
ELEVATION ____ AZIMUTH 324 DIP -45°
STARTED Oct. 18, 1996 FINISHED Oct. 19, 1996

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH
0	-45				
400	-38				

HOLE NO. 96-3 SHEET NO. 1
REMARKS

Ralph V Stewart
LOGGED BY Ralph Stewart
LOG COMPLETED October 24, 1996

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	Au oz/t.	Cu ppm	Zn ppm
				%							
0	11	Casing									
11	49	Medium green colored, fine grained meta-andesite, moderately fractured with red oxidized "slip planes", from 0 - 32'. Rock is fractured with hairline openings coated with pale green colored epidote, and minor (<1%) fine disseminated pyrite. A few quartz carb. veinlets @ 47'-49', but very minor associated pyrite. Highly fractured zone @ 39'-44'.									
		27.4 - 28.7.- Epidote coated fractures with fine disseminated pyrite.	MC 96 -40	1	27.4	28.7	1.3	1	N/A	81	89
49	70	Highly fractured & sheared zone-meta-andesite 49'-65'. The rock is moderately carbonatized, and locally schistose at 40° to core axis. From 65 to 70, the rock is more competent, but contains negligible pyrite.									
70	82.4	Greenish gray colored meta-andesite--- moderately to highly carbonatized, and cut by a few quartz carb. veins at 30 to 45 degrees to core axis. Negligible pyrite content.									

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DIAMOND DRILL RECORD

NAME OF PROPERTY _____

HOLE NO. 96-3 SHEET NO. 2

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	ASSAYS Au oz/t.	ASSAYS Cu ppm	ASSAYS Zn ppm
				o/o							
82.4	104	Medium green colored meta-andesite, cut by numerous hair line quartz carbonate veinlets @ 45 to 55 degrees to core axis. 82.4'- 92'.-Negligible disseminated pyrite. 92'- 104'.-Increase in % of disseminated pyrite with trace of chalcopyrite, adjacent the wider quartz veins. 95' - 97.6'.-10% narrow quartz carb. veins with 2% disseminated pyrite.	MC 96 -41	2	95	97.6	2.6	4	N/A	156	89
104	112.8	Brownish gray colored, fine grained felsite dyke, cut by a few quartz veins with associated cubic pyrite @ 45 degrees to core axis. Streaks of "sulphide veinlets" (1/16") cut the dyke at 25 degrees to core axis. Locally the dyke is "banded" with dark green more mafic layers. The pyrite content is estimated at 2% (cubic pyrite). 105 - 106.-Banded felsic & mafic layers	MC 96 -42	2	105	106	1.0	2	N/A	10	40
		107 - 109.-Felsite dyke with 2/3 quartz veins(1"-1/2" thick), and large pyrite cubes (1/4"), and 3% sulphides adjacent the veins.	MC 96 -43	3	107	109	2.0	5	N/A	2	34
		109 - 111.-Felsite cut by widely spaced streaks of sulphides (2%).	MC 96 -44	2	109	111	2.0	4	N/A	3	30

DIAMOND DRILL RECORD

NAME OF PROPERTY

HOLE NO. 96-3 SHEET NO. 3

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	ASSAYS Au oz/t.	ASSAYS Cu ppm	ASSAYS Zn ppm
				o/o							
112.8	136	Medium green colored meta-andesite, moderately carbonatized and cut by 1-2% white colored quartz carb. veins and veinlets, generally at 20-40 degrees to core axis. Minor disseminated pyrite (1.5%) throughout.									
		129 - 130.7.-Volcanics with 1" wide quartz vein and associated pyrite (2%).	MC 96-45	2	129	130.7	1.7	18	N/A	130	73
		132 - 136.- Highly silicified meta-andesite 30% silicification, cut by quartz veinlets.									
136	163	Grayish brown colored felsite dyke, cut by white quartz veins (1/4" - 1/2" thick) and "wispey" fine disseminated sulphide lines, at 30 degrees to core axis. Quartz veins are widely spaced (12"-30" apart). Estimated 2.5% disseminated sulphides, increasing to 4.5% pyrite cubes adjacent the quartz veins.									
		137.3 - 139.3.-Mainly fine disseminated pyrite, and fine disseminated pyrite stringers.	MC 96-46	2	137.3	139.3	2.0	626	.02	27	33
		139.3 - 141.3.-As above, but an increase in % pyrite.	MC 96-47	3	139.	141.3	2.0	279	.01	9	21
		143.8 - 146.8.-Rock cut by 3 quartz veins	MC 96-48	2	143.8	146.8	3.0	356	.01	63	10

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DIAMOND DRILL RECORD

NAME OF PROPERTY _____

HOLE NO. 96-3 SHEET NO. 4

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	Au oz/t.	Cu ppm	Zn ppm
				%							
136	163	Cont.									
		152 - 155.-Rock cut by quartz veins (1/2"-2" wide), sulphide "streaks".	MC 96-49	4	152	155	3.0	56	N/A	83	99
		156.1 - 158.1.- Few narrow quartz veins (1/8" wide) and 2% pyrite steaks.	MC 96-50	2	156.1	158.1	2.0	32	N/A	808	13
		161 - 161.- A 12" layer of meta-andesite.									
163	207	Grayish green colored meta-andesite, moderately sheared (schistose), with sporadic and sparse cubic pyrite, disseminated throughout. Rock is cut by white colored carbonate veinlets at 40 deg. to core axis. There are a few local concentrations of disseminated sulphides, but they generally occur as trace to 1% adjacent the carbonate veinlets.									
207	218.5	Green to gray colored, silicified meta-andesite (mottled looking), with pervasive silicification increasing toward 218'. The more silicified sections were sampled and the generally contain 1%-3% disseminated sulphides.	MC 96-51	2	207	209	2.0	2	N/A	130	107
		207 - 209.- 30% silicification with 2% diss sulphides.	MC 96-52	3	212	214	2.0	5	N/A	129	80
		212 - 214.- 50% silicification with 3% diss pyrite.									
		215 - 217.- 70% silicification with 3% diss pyrite.	MC 96-53	3	215	217	2.0	367	.01	36	46

DIAMOND DRILL RECORD

NAME OF PROPERTY _____

HOLE NO. 96-3 SHEET NO. 5

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	Au oz/t.	Cu ppm	Zn ppm
				%							
218.5	230	Fine grained massive talc carbonate rock, generally devoid of sulphides.									
230	234	More felsic, silicified volcanics, with 2-3% disseminated sulphides.	MC 96-54	4	231.5	232.8	1.3	86	N/A	111	57
234	236	Fine grained, dark gray colored quartz porphyry dyke, and a 2 foot wide felsic dykelet intrudes the porphyry.									
236	241	Pale purple to gray colored, coarse grained volcanic breccia with disseminated sulphides (pyrite).	MC 96-55	2	237	239	2.0	29	N/A	41	49
241	243	Fine grained felsite dyke?, no pyrite.									
243	260	Dark purplish green colored, variolitic intermediate volcanic flow. Variolites are 1/2"-1" in diameter and occupy about 60% of the rock.	MC 96-56	1.5	252.3	253.5	1.2	7	N/A	83	99
260	279	Fine grained meta-andesite, cut by sporadic widely spaced quartz carb. veins, with minor disseminated pyrite (<1%)									
279	282	Grayish pink colored, fine grained felsite dyke, cut by one 3/4" white colored quartz vein, and a few narrow veins (1/16").	MC 96-57	2	280	281.6	1.6	97	N/A	25	42
282	314	Fine grained, meta-andesite, cut by a few sporadic quartz carb. veins, and disseminated pyrite.									
		307 - 308.-Volcanic rock cut by a number of quartz carb veinlets, and about 2% diss. pyrite.	MC 96-58	2	307	308	1.0	10	N/A	66	46

DIAMOND DRILL RECORD

NAME OF PROPERTY

HOLE NO. 96-3 SHEET NO. 6

FOOTAGE FROM	FOOTAGE TO	DESCRIPTION	SAMPLE NO.	SAMPLE % SULPHIDES	SAMPLE FOOTAGE FROM	SAMPLE FOOTAGE TO	SAMPLE FOOTAGE TOTAL	ASSAYS Au ppb	Au oz/t.	Cu ppm	Zn ppm
				O/O							
314	332	Dark green colored variolitic volcanics/ meta-andesite, and variolites are purplish gray, making up approximately 60% of the core. The groundmass is a fine grained andesite with 1% disseminated pyrite.	MC 96-59	3	334	335.2	1.2	1	N/A	29	60
332	334.5	Dark gray to pink colored, fine grained dioritic granite, with 3% fine diss. pyrite (dyke).									
334.5	384	Interlayered, medium green colored meta-andesite, and pale green colored variolitic flow rock. Variolites are smaller (1/8"-1/2"), and w/trace of fine grained pyrite cubes. The sulphides are generally associated with widely spaced, 1/4" wide quartz carb. veins at 40 degrees to core axis.									
		376 - 377.-Fractured zone with 11/2" quartz -epidote veins, with 2% disseminated pyrite.	MC 96-60	2	376	377	1.0	4	N/A	152	67
384	395	Green colored, meta diabase or andesite flow, cut by 3 or 4 gray colored quartz carb veins (hairline to 1/4" wide), with sporadic disseminated pyrite.									
395	400	Sheared "talcy" zone w/ quartz. Shearing at 70 degrees to core axis. 15% carbonate quartz veining (hairline to 1/4" width).	MC 96-61	5	396	397	1.0	19	N/A	20	42
		396 - 397.-Shear zone w/ 10% quartz vein stringers									
		END HOLE									

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XRAL Laboratories
A Division of SGS Canada Inc.

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Fax (416) 445-4152

CERTIFICATE OF ANALYSIS

REPORT 10477

TO: RALPH V. STEWART
244 KEEWATIN STREET SOUTH
OSHAWA, ONTARIO
L1H 6Z8

CUSTOMER No. 40

DATE SUBMITTED
28-Oct-96

WORKORDER 11626-

TOTAL PAGES 8

64 ROCKS

	METHOD	DETECTION LIMIT	METHOD CODE		METHOD	DETECTION LIMIT	METHOD CODE
AU PPB	FADCP	1.	FA-15	CU PPM	ICP	.5	ICP-70
BE PPM	ICP	.5	ICP-70	ZN PPM	ICP	.5	ICP-70
NA %	ICP	.01	ICP-70	AS PPM	ICP	3.	ICP-70
MG %	ICP	.01	ICP-70	SR PPM	ICP	.5	ICP-70
AL %	ICP	.01	ICP-70	Y PPM	ICP	.5	ICP-70
P %	ICP	.01	ICP-70	ZR PPM	ICP	.5	ICP-70
K %	ICP	.01	ICP-70	MO PPM	ICP	1.	ICP-70
CA %	ICP	.01	ICP-70	AG PPM	ICP	.2	ICP-70
SC PPM	ICP	.5	ICP-70	CD PPM	ICP	1.	ICP-70
TI %	ICP	.01	ICP-70	SN PPM	ICP	10.	ICP-70
V PPM	ICP	2.	ICP-70	SB PPM	ICP	5.	ICP-70
CR PPM	ICP	1.	ICP-70	BA PPM	ICP	1.	ICP-70
MN PPM	ICP	2.	ICP-70	LA PPM	ICP	.5	ICP-70
FE %	ICP	.01	ICP-70	W PPM	ICP	10.	ICP-70
CO PPM	ICP	1.	ICP-70	PB PPM	ICP	2.	ICP-70
NI PPM	ICP	1.	ICP-70	BI PPM	ICP	5.	ICP-70

*** UNLESS INSTRUCTED OTHERWISE WE WILL DISCARD PULPS IN 90 DAYS ***
AND REJECTS IN 30 DAYS FROM THE DATE OF THIS REPORT

ATE 18-NOV-96

CERTIFIED BY

Dr. Hugh de Souza, General Manager

XRAL

18-NOV-96 REPORT 10477 WORKORDER 11626-

SAMPLE	AU PPB FADCP FA-15	BE PPM ICP ICP-70	NA % ICP ICP-70	MG % ICP ICP-70	AL % ICP ICP-70	P % ICP ICP-70	K % ICP ICP-70	CA % ICP ICP-70
MC 96-1	<1	<.5	.10	.58	.85	.03	.08	.80
MC 96-2	8	<.5	.10	.53	1.03	.08	.26	3.46
MC 96-3	13	<.5	.18	.93	1.46	.03	.10	.95
MC 96-4	8	<.5	.15	.30	.67	.09	.02	.92
MC 96-5	5	<.5	.19	.64	1.77	.09	.20	1.16
MC 96-6	4	<.5	.21	.69	1.81	.04	.25	3.69
MC 96-7	2	.6	.17	.40	.55	.19	.08	1.51
MC 96-8	3	<.5	.13	.79	1.13	.04	.03	.92
MC 96-9	4	<.5	.17	.59	.88	.04	.04	.58
MC 96-10	9	<.5	.14	.36	.79	.03	.03	.88
MC 96-11	7	<.5	.14	.27	.56	.03	.01	.85
MC 96-12	2	<.5	.16	.35	.72	.03	.02	.75
MC 96-13	2	<.5	.12	.84	1.31	.03	.03	2.34
MC 96-14	19	<.5	.22	2.27	2.58	.04	<.01	4.61
MC 96-15	<1	<.5	.12	1.74	1.45	.24	<.01	2.56
MC 96-16	6	<.5	.30	2.28	2.23	.03	<.01	.84
MC 96-17	12	<.5	.04	.63	.80	.05	.11	2.42
MC 96-18	18	<.5	.03	.82	.21	.05	.16	3.36
MC 96-19	2	.6	.03	2.90	2.71	.06	<.01	5.65
MC 96-20	8	<.5	.04	2.76	.43	.02	.09	6.48
MC 96-21	4	<.5	.04	2.68	.24	.02	.08	6.59
MC 96-22	47	<.5	.06	2.85	.54	.02	.06	6.22
MC 96-23	4	<.5	.04	2.64	.21	.02	.11	6.14
MC 96-24	16	<.5	.07	2.97	.38	.02	.10	5.97
MC 96-24A	13	<.5	.03	1.95	3.24	.02	.05	5.89
MC 96-25	2	<.5	.03	2.21	2.51	.02	<.01	2.53
MC 96-26	6	<.5	.02	2.16	2.92	.02	<.01	4.69
MC 96-27	5	<.5	.02	2.20	2.81	.01	<.01	3.47
MC 96-28	3	<.5	.05	1.82	2.33	.02	<.01	2.60
MC 96-29	3	<.5	.06	1.95	2.71	.02	<.01	4.64
MC 96-30	3	<.5	.05	2.62	3.39	.02	<.01	2.94
MC 96-31	4	<.5	.07	1.92	2.64	.02	<.01	4.45
MC 96-31A	2	<.5	.05	1.72	2.22	.02	<.01	3.17
MC 96-32	8	<.5	.05	2.31	2.59	.02	<.01	4.40
MC 96-33	1	<.5	.05	1.98	1.45	.08	.10	3.70
MC 96-34	2	.5	.04	2.99	2.32	.08	.03	4.70
MC 96-34A	2	<.5	.04	2.74	2.62	.02	.02	3.24
MC 96-35	3	<.5	.06	1.43	1.15	.25	.03	2.46
MC 96-36	20	<.5	.05	2.29	2.05	.03	.01	5.61
MC 96-37	4	<.5	.05	2.23	2.11	.03	.03	4.61

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SAMPLE	AU PPB FADCP FA-15	BE PPM ICP ICP-70	NA % ICP ICP-70	MG % ICP ICP-70	AL % ICP ICP-70	P % ICP ICP-70	K % ICP ICP-70	CA % ICP ICP-70
MC 96-40	1	<.5	.06	2.39	2.79	.02	<.01	2.84
MC 96-41	4	<.5	.04	2.93	4.10	.02	.05	5.98
MC 96-42	2	<.5	.04	.93	.77	.08	.16	3.25
MC 96-43	5	<.5	.05	.61	.36	.08	.13	2.78
MC 96-44	4	<.5	.05	.63	.37	.07	.14	2.78
MC 96-45	18	<.5	.03	2.16	3.23	.02	.01	7.36
MC 96-46	626	<.5	.05	.82	.30	.03	.14	2.92
MC 96-47	279	<.5	.06	.31	.21	.03	.13	1.39
MC 96-48	356	<.5	.05	.28	.58	.03	.13	1.75
MC 96-49	56	<.5	.05	.21	.50	.04	.13	1.98
MC 96-50	32	<.5	.05	.28	.57	.04	.12	3.10
MC 96-51	2	<.5	.03	1.91	4.37	.08	<.01	5.22
MC 96-52	5	<.5	.04	1.32	2.77	.08	.04	4.11
MC 96-53	367	<.5	.05	1.28	.99	.09	.09	4.61
MC 96-54	86	<.5	.07	1.87	.79	.09	.07	4.30
MC 96-55	29	<.5	.05	1.23	.94	.08	.05	3.52
MC 96-56	7	<.5	.08	1.42	2.99	.08	.03	4.45
MC 96-57	97	<.5	.08	1.46	.51	.09	.09	4.72
MC 96-58	10	<.5	.16	1.04	1.81	.11	.04	4.14
MC 96-59	1	.8	.10	1.94	1.73	.20	<.01	5.72
MC 96-60	4	<.5	.12	2.02	2.51	.07	<.01	4.02
MC 96-61	19	<.5	.07	1.68	1.85	.05	.08	5.49
~~CURRIE 96-1~~	~~25~~	~~<.5~~	~~.06~~	~~.70~~	~~1.71~~	~~.02~~	~~.03~~	~~1.08~~
MC 96-4-1	63	<.5	.04	2.99	.16	.03	.12	6.63
D MC 96-1	2	<.5	.12	.62	.91	.04	.08	.87
D MC 96-13	2	<.5	.14	.91	1.37	.03	.02	2.52
D MC 96-24A	14	<.5	.03	1.98	3.29	.02	.05	5.61
D MC 96-34A	<1	<.5	.04	2.95	2.82	.02	.02	3.28
D MC 96-46	594	<.5	.05	.83	.30	.03	.13	2.99
D MC 96-58	8	<.5	.16	.98	1.71	.10	.04	3.99

D - QUALITY CONTROL DUPLICATE

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SAMPLE	SC PPM ICP ICP-70	TI % ICP ICP-70	V PPM ICP ICP-70	CR PPM ICP ICP-70	MN PPM ICP ICP-70	FE % ICP ICP-70	CO PPM ICP ICP-70	NI PPM ICP ICP-70
MC 96-1	3.4	.06	56	34	199	2.67	30	54
MC 96-2	6.1	.09	66	39	533	4.08	23	19
MC 96-3	5.1	.07	89	46	327	3.72	31	34
MC 96-4	5.8	.05	45	63	232	2.72	17	13
MC 96-5	5.8	.07	54	47	276	3.22	17	14
MC 96-6	4.7	.11	74	55	577	3.43	23	24
MC 96-7	1.4	.10	19	60	122	1.05	12	36
MC 96-8	4.3	.08	57	29	330	2.74	17	16
MC 96-9	4.3	.07	65	36	228	2.37	21	19
MC 96-10	3.6	.09	41	33	217	1.49	10	8
MC 96-11	3.5	.11	38	50	171	1.26	12	9
MC 96-12	3.5	.07	40	51	179	2.57	65	15
MC 96-13	6.7	.08	99	26	346	4.08	29	20
MC 96-14	24.0	.15	265	128	1350	7.18	52	87
MC 96-15	1.4	.06	62	201	478	2.53	18	58
MC 96-16	2.0	.11	86	90	701	3.60	39	60
MC 96-17	2.9	<.01	19	76	546	2.67	9	11
MC 96-18	2.1	<.01	4	27	892	3.26	15	8
MC 96-19	16.4	.01	191	118	1100	5.36	28	57
MC 96-20	11.1	<.01	27	22	1510	5.45	30	54
MC 96-21	12.8	<.01	17	25	1460	5.15	29	50
MC 96-22	19.7	<.01	33	28	1320	5.26	32	67
MC 96-23	11.6	<.01	13	24	1220	5.21	31	53
MC 96-24	15.3	<.01	27	26	1590	5.69	28	56
MC 96-24A	25.1	.04	241	66	1560	6.66	40	59
MC 96-25	8.1	.08	151	63	1230	5.00	42	61
MC 96-26	9.3	.05	162	59	1450	6.37	48	60
MC 96-27	3.1	.06	115	55	1580	7.24	47	58
MC 96-28	3.0	.08	131	63	1130	4.94	38	58
MC 96-29	2.0	.10	152	66	1480	5.53	43	69
MC 96-30	3.2	.10	161	70	1740	6.52	44	73
MC 96-31	5.2	.10	162	68	1590	5.85	49	67
MC 96-31A	2.6	.10	120	58	1380	5.01	39	62
MC 96-32	7.7	.09	171	62	1520	4.90	38	54
MC 96-33	2.8	.07	60	201	663	2.44	17	98
MC 96-34	9.5	.06	98	204	774	3.61	32	94
MC 96-34A	18.5	.07	208	52	1050	5.83	35	37
MC 96-35	1.1	.06	47	133	457	2.09	18	43
MC 96-36	13.8	.01	227	14	1200	5.86	32	24
MC 96-37	13.9	.02	261	20	1260	6.77	38	24

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SAMPLE	SC PPM ICP ICP-70	TI % ICP ICP-70	V PPM ICP ICP-70	CR PPM ICP ICP-70	MN PPM ICP ICP-70	FE % ICP ICP-70	CO PPM ICP ICP-70	NI PPM ICP ICP-70
MC 96-40	2.3	.11	107	60	1370	5.30	40	61
MC 96-41	23.0	.02	239	64	1590	7.53	48	61
MC 96-42	2.2	<.01	7	22	1020	3.47	9	6
MC 96-43	1.7	<.01	4	31	863	2.65	7	2
MC 96-44	1.7	<.01	4	33	842	2.47	6	2
MC 96-45	24.2	<.01	235	61	1590	6.17	38	51
MC 96-46	3.0	<.01	9	37	747	3.02	14	17
MC 96-47	.8	<.01	<2	47	505	1.67	5	3
MC 96-48	.9	<.01	3	65	307	1.86	8	4
MC 96-49	.8	<.01	<2	59	282	1.75	4	4
MC 96-50	1.7	<.01	4	75	470	1.69	6	8
MC 96-51	10.3	.02	83	20	2520	10.3	18	17
MC 96-52	12.8	.02	71	43	1310	6.96	33	14
MC 96-53	8.7	<.01	16	32	1550	5.35	13	13
MC 96-54	11.7	<.01	27	38	1030	5.39	26	35
MC 96-55	12.2	<.01	29	31	971	5.28	14	13
MC 96-56	14.2	.02	81	23	1150	6.29	20	13
MC 96-57	9.5	<.01	11	50	1170	4.33	16	29
MC 96-58	10.3	<.01	62	54	915	4.52	16	16
MC 96-59	6.9	.09	62	69	847	3.17	18	45
MC 96-60	3.5	.10	80	65	1100	4.96	24	30
MC 96-61	6.4	<.01	78	67	977	3.39	28	25
CURRIE 96-1	4.6	.09	79	124	408	4.11	35	59
MC 96-4-1	7.2	<.01	14	94	824	2.91	15	49
D MC 96-1	4.3	.06	60	38	217	2.98	32	58
D MC 96-13	8.0	.08	124	30	380	4.46	32	22
D MC 96-24A	25.0	.05	247	66	1540	6.72	40	61
D MC 96-34A	18.9	.09	215	55	1120	6.00	36	40
D MC 96-46	3.0	<.01	8	34	758	3.09	13	15
D MC 96-58	9.8	<.01	59	51	872	4.29	15	15

D - QUALITY CONTROL DUPLICATE

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SAMPLE	CU PPM ICP ICP-70	ZN PPM ICP ICP-70	AS PPM ICP ICP-70	SR PPM ICP ICP-70	Y PPM ICP ICP-70	ZR PPM ICP ICP-70	MO PPM ICP ICP-70	AG PPM ICP ICP-70
MC 96-1	179	20.0	<3	4.0	3.1	3.0	<1	<.2
MC 96-2	107	44.5	4	18.4	6.3	4.4	<1	<.2
MC 96-3	125	133	<3	8.9	3.0	3.8	<1	<.2
MC 96-4	147	19.8	<3	6.1	9.2	3.7	<1	<.2
MC 96-5	101	88.8	<3	9.5	7.3	3.6	<1	<.2
MC 96-6	156	36.7	3	10.6	3.8	3.7	<1	<.2
MC 96-7	38.9	47.6	3	71.6	4.8	68.7	<1	<.2
MC 96-8	199	29.7	<3	3.9	4.5	5.5	7	<.2
MC 96-9	115	34.7	<3	3.0	5.6	3.8	2	<.2
MC 96-10	43.5	16.7	<3	10.6	4.2	2.8	<1	<.2
MC 96-11	79.4	40.7	<3	7.1	4.5	2.9	<1	<.2
MC 96-12	687	14.7	3	9.6	3.8	3.5	<1	.3
MC 96-13	242	32.9	<3	7.3	4.6	4.4	<1	<.2
MC 96-14	120	91.7	<3	39.6	5.9	4.3	3	.2
MC 96-15	58.4	39.8	<3	89.7	7.2	36.2	2	<.2
MC 96-16	144	61.3	3	22.9	2.3	6.3	3	.3
MC 96-17	15.5	36.0	<3	37.9	5.0	12.3	3	1.9
MC 96-18	5.6	39.8	<3	74.2	5.8	14.1	<1	<.2
MC 96-19	93.2	55.9	<3	136	4.5	9.0	<1	<.2
MC 96-20	91.8	45.0	<3	111	4.0	5.4	<1	.3
MC 96-21	76.7	47.5	<3	117	3.8	5.0	11	.2
MC 96-22	49.4	53.7	<3	80.8	3.3	5.2	2	.3
MC 96-23	74.6	54.0	<3	117	4.6	4.8	<1	.3
MC 96-24	73.0	50.5	<3	66.5	4.1	5.2	<1	.4
MC 96-24A	126	76.0	<3	51.8	2.6	6.7	<1	.5
MC 96-25	122	80.5	<3	33.3	1.8	6.0	<1	.2
MC 96-26	148	83.6	<3	33.9	1.8	6.8	<1	.4
MC 96-27	160	78.7	5	17.4	1.8	7.0	<1	.5
MC 96-28	111	63.3	4	15.7	1.5	4.8	<1	.4
MC 96-29	151	72.9	<3	20.5	1.9	5.3	<1	.3
MC 96-30	108	100	<3	16.8	1.5	6.2	<1	.3
MC 96-31	156	76.2	<3	21.3	2.2	6.0	<1	.2
MC 96-31A	126	70.4	<3	19.3	1.6	5.0	<1	.3
MC 96-32	104	68.9	<3	46.3	3.0	5.7	3	.3
MC 96-33	17.5	44.4	<3	99.9	5.7	49.7	<1	<.2
MC 96-34	113	59.1	<3	189	4.8	27.4	<1	<.2
MC 96-34A	108	66.7	<3	64.7	5.7	7.1	<1	.2
MC 96-35	77.5	36.0	<3	94.3	8.2	35.0	<1	<.2
MC 96-36	125	60.1	<3	138	4.5	7.1	<1	<.2
MC 96-37	134	66.3	<3	125	6.3	6.8	<1	<.2

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SAMPLE	CU PPM ICP ICP-70	ZN PPM ICP ICP-70	AS PPM ICP ICP-70	SR PPM ICP ICP-70	Y PPM ICP ICP-70	ZR PPM ICP ICP-70	MO PPM ICP ICP-70	AG PPM ICP ICP-70
MC 96-40	81.4	88.6	<3	16.3	2.2	5.5	<1	<.2
MC 96-41	156	85.4	<3	59.0	2.6	7.2	<1	.6
MC 96-42	9.9	39.7	<3	59.7	4.8	10.3	12	.2
MC 96-43	2.4	35.1	<3	64.0	4.3	13.3	4	.3
MC 96-44	3.1	29.6	4	55.9	4.6	12.7	2	<.2
MC 96-45	130	72.5	<3	82.2	2.8	6.4	<1	<.2
MC 96-46	26.9	32.8	5	59.0	4.8	17.6	1	.4
MC 96-47	8.7	20.9	5	24.7	4.4	26.8	2	.3
MC 96-48	62.9	9.5	4	13.2	6.0	26.0	2	.3
MC 96-49	32.4	7.3	<3	13.3	5.9	27.8	4	.2
MC 96-50	808	13.1	<3	19.5	10.9	29.8	3	.2
MC 96-51	130	107	<3	41.8	7.1	14.9	<1	.6
MC 96-52	129	80.3	<3	57.8	7.1	11.1	<1	.3
MC 96-53	36.3	46.3	<3	105	5.8	8.1	<1	.3
MC 96-54	111	56.8	<3	97.4	5.7	7.8	<1	.3
MC 96-55	40.8	48.7	<3	84.9	4.7	7.1	<1	<.2
MC 96-56	83.0	98.9	<3	58.5	5.8	8.6	<1	.4
MC 96-57	24.9	41.9	<3	119	9.0	9.9	<1	.3
MC 96-58	66.0	46.3	<3	43.5	15.1	6.5	<1	.3
MC 96-59	29.1	60.2	4	165	8.0	47.7	<1	<.2
MC 96-60	152	67.4	<3	24.8	5.8	7.8	<1	.3
MC 96-61	19.7	41.5	3	51.4	7.9	6.4	<1	<.2
CURRIE 96-1	287	368	10	8.3	1.9	6.1	1	5.2
MC 96-4-1	149	35.8	<3	238	3.5	9.5	5	.2
D MC 96-1	195	21.0	<3	4.7	3.8	3.8	<1	<.2
D MC 96-13	256	39.6	<3	8.3	4.2	3.7	<1	<.2
D MC 96-24A	117	78.5	<3	50.1	2.8	6.8	<1	.3
D MC 96-34A	109	71.2	<3	66.2	5.8	6.2	<1	.4
D MC 96-46	27.8	32.1	3	61.1	4.0	15.9	<1	.5
D MC 96-58	62.8	44.7	<3	41.6	14.2	7.0	<1	<.2

D - QUALITY CONTROL DUPLICATE

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18-NOV-96 REPORT 10477 WORKORDER 11626-

SAMPLE	CD PPM ICP ICP-70	SN PPM ICP ICP-70	SB PPM ICP ICP-70	BA PPM ICP ICP-70	LA PPM ICP ICP-70	W PPM ICP ICP-70	PB PPM ICP ICP-70	BI PPM ICP ICP-70
MC 96-1	<1	<10	<5	14	1.7	<10	<2	<5
MC 96-2	<1	<10	<5	38	1.0	<10	<2	<5
MC 96-3	<1	<10	<5	22	<.5	<10	<2	<5
MC 96-4	<1	<10	<5	4	3.4	<10	<2	<5
MC 96-5	<1	<10	<5	142	3.0	<10	<2	<5
MC 96-6	<1	<10	<5	52	1.2	<10	<2	<5
MC 96-7	<1	<10	<5	36	51.7	<10	3	<5
MC 96-8	<1	<10	<5	4	.9	<10	<2	<5
MC 96-9	<1	<10	<5	9	1.9	<10	<2	<5
MC 96-10	<1	<10	<5	7	.7	<10	<2	<5
MC 96-11	<1	<10	<5	2	.8	<10	<2	<5
MC 96-12	<1	<10	<5	3	1.1	<10	<2	<5
MC 96-13	<1	<10	<5	4	1.0	<10	<2	<5
MC 96-14	<1	<10	<5	20	<.5	<10	<2	<5
MC 96-15	<1	<10	<5	1130	19.7	<10	<2	<5
MC 96-16	<1	<10	<5	377	<.5	<10	<2	<5
MC 96-17	<1	<10	<5	31	5.3	<10	13	<5
MC 96-18	<1	<10	<5	32	3.5	<10	4	<5
MC 96-19	<1	<10	<5	45	2.8	<10	<2	<5
MC 96-20	<1	<10	<5	16	1.1	<10	<2	<5
MC 96-21	<1	<10	<5	13	<.5	<10	3	<5
MC 96-22	<1	<10	<5	9	<.5	<10	<2	<5
MC 96-23	<1	<10	<5	14	<.5	<10	<2	<5
MC 96-24	<1	<10	<5	13	<.5	<10	<2	<5
MC 96-24A	<1	<10	<5	10	<.5	<10	<2	<5
MC 96-25	<1	<10	<5	28	<.5	<10	<2	<5
MC 96-26	<1	<10	<5	5	.8	<10	<2	<5
MC 96-27	<1	<10	<5	5	<.5	<10	<2	<5
MC 96-28	<1	<10	<5	3	<.5	<10	<2	<5
MC 96-29	<1	<10	<5	3	<.5	<10	<2	<5
MC 96-30	<1	<10	<5	5	<.5	<10	<2	<5
MC 96-31	<1	<10	<5	4	<.5	<10	<2	<5
MC 96-31A	<1	<10	<5	5	<.5	<10	<2	<5
MC 96-32	<1	<10	<5	15	1.1	<10	<2	<5
MC 96-33	<1	<10	<5	107	41.1	<10	8	<5
MC 96-34	<1	<10	<5	1510	24.5	<10	<2	<5
MC 96-34A	<1	<10	<5	13	<.5	<10	<2	<5
MC 96-35	<1	<10	<5	204	21.1	<10	<2	<5
MC 96-36	<1	<10	<5	10	.6	<10	<2	<5
MC 96-37	<1	<10	<5	20	.6	<10	<2	<5

XRAL

18-NOV-96 REPORT 10477 WORKORDER 11626-

SAMPLE	CD PPM ICP ICP-70	SN PPM ICP ICP-70	SB PPM ICP ICP-70	BA PPM ICP ICP-70	LA PPM ICP ICP-70	W PPM ICP ICP-70	PB PPM ICP ICP-70	BI PPM ICP ICP-70
MC 96-40	<1	<10	<5	16	<.5	<10	<2	<5
MC 96-41	<1	<10	<5	15	<.5	<10	<2	<5
MC 96-42	<1	<10	<5	34	5.2	<10	<2	<5
MC 96-43	<1	<10	<5	30	3.8	<10	4	<5
MC 96-44	<1	<10	<5	31	6.0	<10	5	<5
MC 96-45	<1	<10	6	8	<.5	<10	<2	<5
MC 96-46	<1	<10	<5	31	3.4	<10	5	<5
MC 96-47	<1	<10	<5	29	5.0	<10	3	<5
MC 96-48	<1	<10	<5	29	7.0	<10	<2	<5
MC 96-49	<1	<10	<5	30	5.7	<10	<2	<5
MC 96-50	<1	<10	<5	27	12.9	<10	<2	<5
MC 96-51	<1	<10	<5	7	2.1	<10	<2	<5
MC 96-52	<1	<10	<5	12	3.8	<10	<2	<5
MC 96-53	<1	<10	<5	14	1.6	<10	<2	<5
MC 96-54	<1	<10	<5	172	2.6	<10	<2	<5
MC 96-55	<1	<10	<5	41	2.7	<10	<2	<5
MC 96-56	<1	<10	<5	11	3.3	<10	<2	<5
MC 96-57	<1	<10	<5	14	3.3	<10	<2	<5
MC 96-58	<1	<10	<5	17	5.0	<10	<2	<5
MC 96-59	<1	<10	<5	229	80.5	<10	3	<5
MC 96-60	<1	<10	<5	5	1.5	<10	<2	<5
MC 96-61	<1	<10	<5	22	3.5	<10	<2	<5
CURRIE 96-1	5	<10	<5	9	<.5	<10	43	<5
MC 96-4-1	<1	<10	<5	161	7.1	<10	4	<5
D MC 96-1	<1	<10	<5	15	1.9	<10	<2	<5
D MC 96-13	<1	<10	<5	4	.5	<10	<2	<5
D MC 96-24A	<1	<10	<5	10	<.5	<10	<2	<5
D MC 96-34A	<1	<10	<5	12	<.5	<10	<2	<5
D MC 96-46	<1	<10	<5	29	2.9	<10	5	<5
D MC 96-58	<1	<10	<5	17	4.5	<10	<2	<5

D - QUALITY CONTROL DUPLICATE

EASE NOTE NEW REMITTANCE ADDRESS
P.O. BOX 9581
ON "A"
NTO, ONT.
W 2K3

Invoice No. 14657

XRAL Laboratories
A Division of SGS Canada Inc.

1885 Leslie St.
Don Mills
Ontario **M3B 3J4**
Canada
Tel: (416) 445-5755
Fax: (416) 445-4152
Telex: 09-986947

Invoice To:
RALPH V. STEWART
244 KEEWATIN STREET SOUTH
OSHAWA, ONTARIO
L1H 6Z8

Invoice Date: 18-Nov-96
Work Order No.: 11626
Date Submitted: 28-Oct-96
Report No.: 10477
Customer No.: 40-82/18317
Your P.O. No.:
Your Project No.:

Submitted To:
RALPH V. STEWART
244 KEEWATIN STREET SOUTH
OSHAWA, ONTARIO
L1H 6Z8

NO. OF PKGS	SHIPPED VIA	WAY BILL NO	SHIPPED FROM	TYPE OF SAMPLES
	SELF		ROCK	

QUANTITY	DESCRIPTION METHOD	CODE NUMBER	UNIT COST	AMOUNT
1. 64	AU (FA-15/1)	10 0 0 0 0	9.45	604.80
2. 64	ICP PKG. (ICP-70)	4 9 0 0 0	8.15	521.60
3. 64	CRUSHING	1 0 0 0 0	2.90	185.60
64	MILLING	1 0 0 0 0	2.65	169.60
	GST REG NO. R105082572 APPLIED TO $1490.60			104.34

Dec/18/96

SHIPPING CHARGES	CUSTOM BROKERAGE	TELEX/FAX	MINIMUM CHARGES
		9.00	

OTHER	SURCHARGE - RUSH SERVICE
TERMS NET 30 DAYS, 1.5% PER MONTH INTEREST ON ACCOUNTS OVER 30 DAYS	

C. CHARGES

ORIGINAL INVOICE
0

TOTAL IN CDN FUNDS $ 1594.94

Swastika Laboratories

A Division of TSL/Assayers Inc.

Assaying - Consulting - Representation

Established 1928

Geochemical Analysis Certificate

6W-2187-RG1

Company: **OLIVER GROUP/CDN ZEOLITE JV**

Date: JUN-24-96

Project:

Attn:

We hereby certify the following Geochemical Analysis of 4 Rock samples submitted JUN-21-96 by .

Sample Number	Au PPB	Au Check PPB	Au 2nd PPB	OZS/TON	GRAMS/TON
96-1	10	-	-		
96-2	22	-	-		
96-3	5018	4982	4937	0.16	4.5
96-4	48	36			

NOTE: Above Are Chip Samples From Outcrops Located Immediately West Of Drill Hole 96-3,

One assay ton portion used.

Certified by _____

P.O. Box 10, Swastika, Ontario P0K 1T0

Telephone (705)642-3244 FAX (705)642-3300


B

REPORT ON AN
INDUCED POLARIZATION SURVEY
MCNEIL TOWNSHIP PROPERTIES
TIMMINS AREA, ONTARIO

FOR

THE OLIVER GROUP

October 10, Pickering, Ontario

R. W. Woolham, P.Eng.

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Contours of Averaged Resistivity Values

South Grid

Contours of Averaged Polarization Values
Contours of Averaged Resistivity Values

* See Appendix C
** See page B-18

INTRODUCTION

This report, prepared for the Oliver Group is an evaluation and interpretation of an induced polarization survey performed on two grids covering properties in McNeil Township. The [redacted] geophysical surveys were carried out by personnel employed by Walcer Geophysics Ltd. during the period August 5 to 18 and September 9 to 12, 1996. The work was supervised by Alex Walcer of Walcer Geophysics Ltd., 2,106 Regional Road #3, Enniskillen, Ontario, L0B 1J0. This report describes the logistics, parameters and results of the geophysical surveys.

PROPERTY LOCATION AND ACCESS

The property is located in the east central part of McNeil Township approximately 50 km southeast of Timmins and 60 km. west of Kirkland Lake as shown on Figure 1. Location Map. The north grid touches the western shore of Whitefish Lake near its north end while the larger south grid is about 3 km southwest of Whitefish Lake.

Access is gained from highway 11 at Matheson via south-southwest trending bush roads a straight line distance of about 55 km.

PROPERTY DESCRIPTION

The property consists of nine contiguous claim blocks numbered 1203943 to 1203947 inclusive, 1207672, 1207683, 1207684 and 1207685 (see Figure 2. Claim Map). The claims are registered in the name of John H. Oliver, 4222 6th Ave. RR #2 Peachland, B.C., V0H 1X0. The author has not examined title to the claims and, accordingly, expresses no opinion as to the validity of title and property description.

PREVIOUS HISTORY

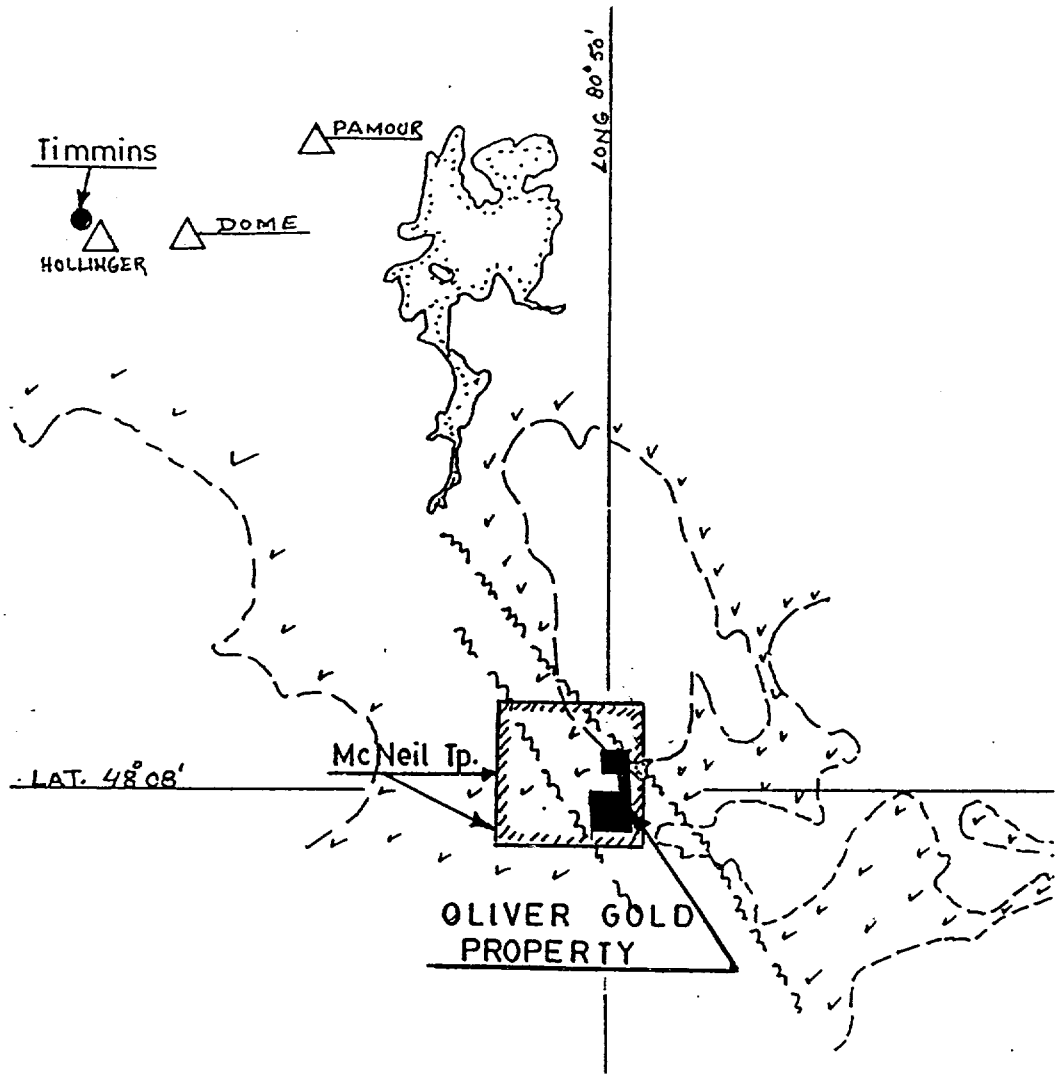
The area has undergone several periods of exploration including geophysics, geological mapping trenching and drilling in 1946 and 1986/87. Kerr Addison Mines explored the property in 1987.

GEOLOGY

Intermediate to mafic volcanic flows of andesite and basalt predominate in the survey area. These rocks are intruded by felsic and mafic dykes. Gold mineralization occurs within altered portions of the volcanics consisting of linear, east-northeast to north-south oriented, carbonate zones.

THE INDUCED POLARIZATION METHOD

A frequency domain IP system was utilized for this survey. In this type of method the



LEGEND

△ GOLD MINE

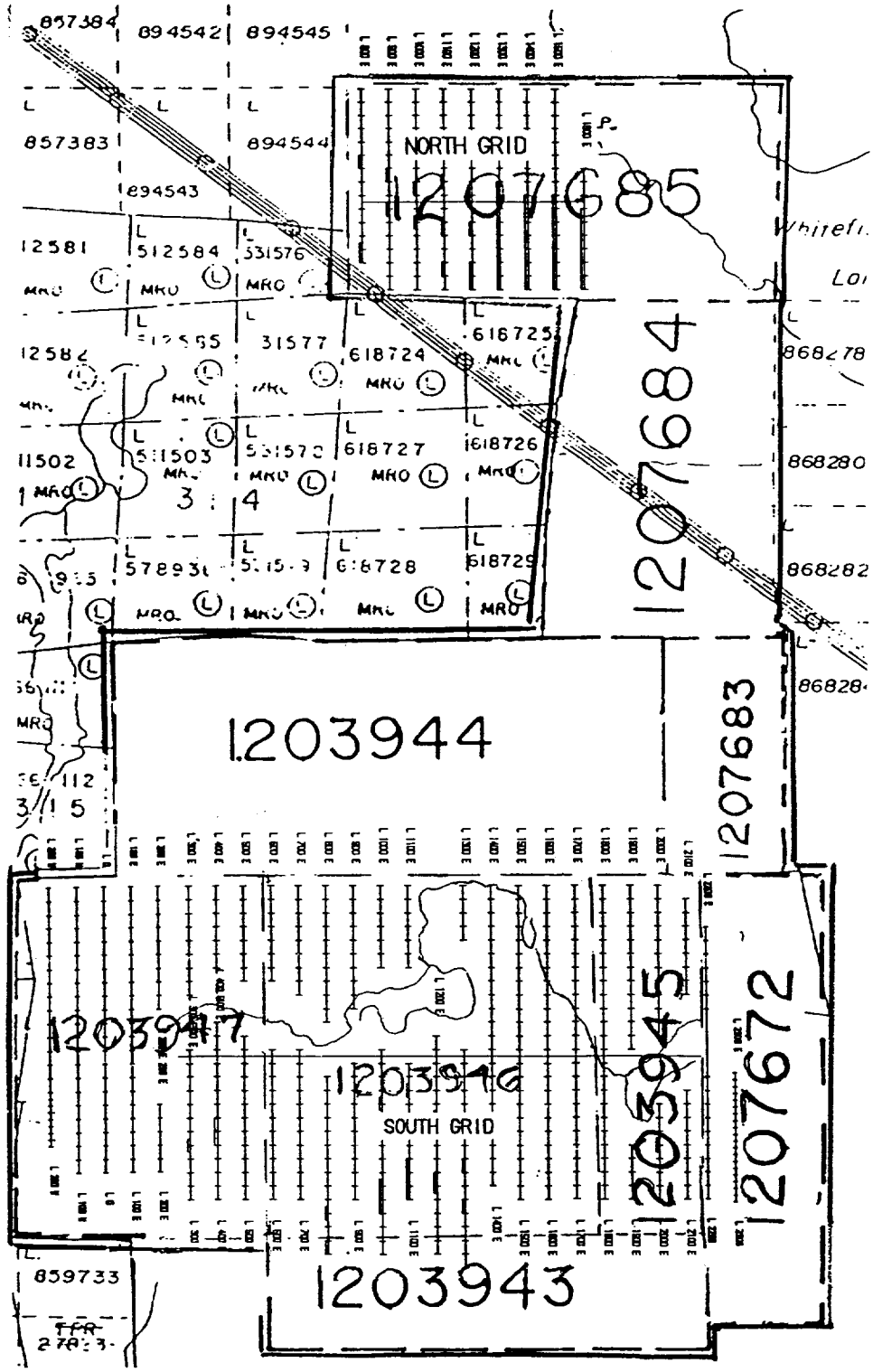
FAVORABLE VOLCANIC ROCK FOR GOLD DEPOSITION

N

FIGURE 1

THE OLIVER GROUP
MCNEIL TOWNSHIP PROPERTY

LOCATION MAP
Scale approximately 1:500,000



N

FIGURE 2

THE OLIVER GROUP
MCNEIL TOWNSHIP PROPERTY

CLAIM MAP AND GRID LOCATIONS
Scale 1:25,000

ground is energized using a pair of grounded electrodes. The voltages across two other grounded electrodes are then measured at two different low frequencies from 5 to 0.1 Hz. The ground acts as a capacitor and as a result the voltages are different for the two frequencies. The higher capacitive effect of the ground, such as the presence of disseminated pyrite or graphite, the greater the difference will be between the two voltages measured. The resistivity is calculated from the voltage and current measurements and the difference of the resistivity values is expressed as a percentage of the lower resistivity and the value is called percent frequency effect or P.F.E. Developments in measurement techniques and understanding of the IP effect in different geological and cultural environments has led to the measurement of the phase angle or phase shift at a specific low frequency. The measurement, expressed as milliradians, involves the use of synchronized crystal clocks for the transmitter and receiver and complex electronic and computer controlled instrumentation that has been developed over the years.

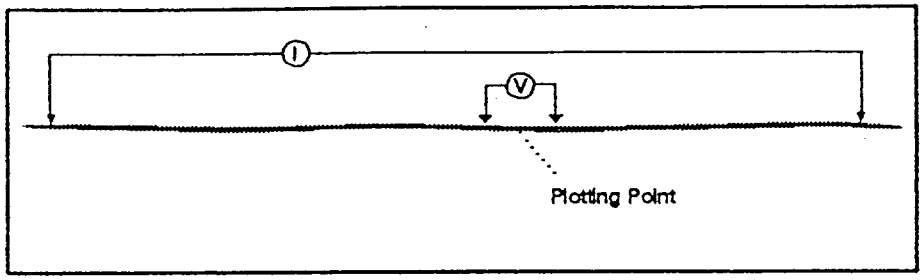
By measuring the phase angle at several frequencies, usually five, it was found that very fine grained disseminated conductive material will give a different signature response than course grained disseminated material. As a result, in specific situations, often fine grained graphitic mineralization within a rock could be differentiated from usually course grained pyritic mineralization. For general field surveys, however, the phase angle is measured at only one low frequency usually 1.0 Hz.

The phase angle is a measure of the polarizability of the material energized within the influence of the electrode array. It is a volume measurement. Various electrode arrays can be used to take this measurement. Several different types of arrays are utilized in the IP method. In Figure 3: IP electrode array configurations used in IP surveys are illustrated. For the dipole-dipole and pole-dipole arrays, the volume measured and therefore the depth of exploration expands as the separation between the transmitter electrodes and receiver electrodes increases. Increases in separation are multiples of the electrode pair spacings "a". These multiples, denoted "n", are for n= 1, 2, 3 etc.

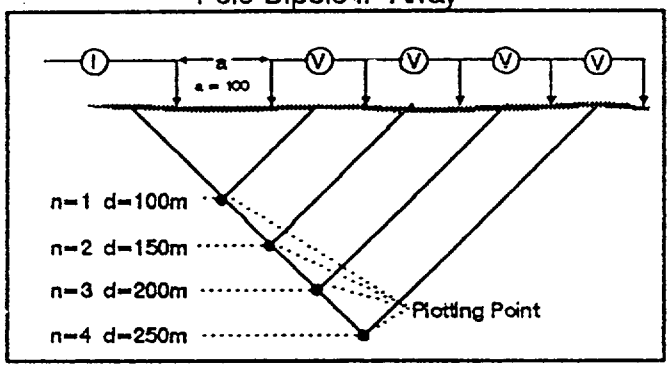
The approximate depth to the centre of the volume measured for any "n" spacing is equal to "n" times "a" times 0.5. If the maximum values for an anomaly start at "n"=1 and if say "a"=100 m, then the top of the source of the anomaly is at 50 m or less. The exact determination of the depth to the top of the source is not possible as many factors are involved including the source geometry and contained polarizable material, location of the electrodes relative to a source with at least one dimension smaller than the "a" spacing, conductivity of the material hosting the polarizable body and the effect of the greater volume being measured for increasing "n" values.

The dipole-dipole and pole-dipole are the array of choice in IP surveys with the dipole-dipole array most favoured because of its symmetry. Unfortunately, survey logistics can be difficult in some areas and the pole-dipole array is therefore often used. The gradient array, logistically more efficient, has lower sensitivity and depth of exploration and is

Gradient IP Array



Pole-Dipole IP Array



Dipole-Dipole IP Array

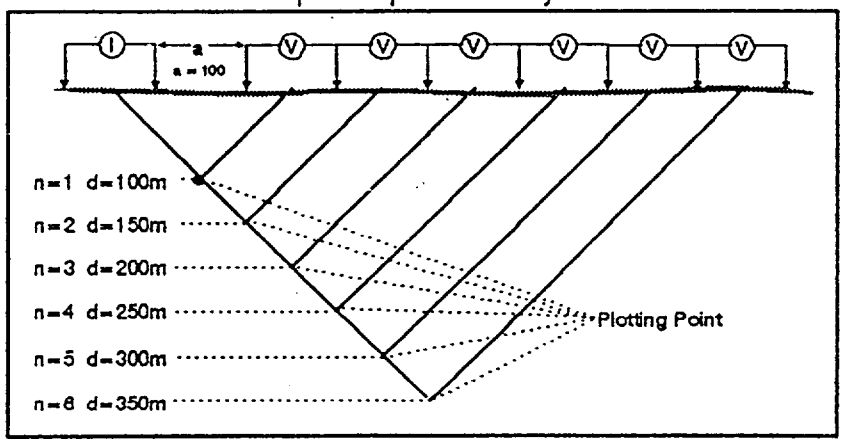


FIGURE 3

THE OLIVER GROUP
MCNEIL TOWNSHIP PROPERTY

THREE TYPES OF ELECTRODE ARRAYS USED IN IP SURVEYS

influenced more by conductive overburden effects.

The IP pseudosection, by its very name, implies a plot that roughly represents an electrical cross-section of the ground but in actual fact includes effects from the volume of material either side of the section. Interpretation of the location of the anomalous responses of interest is a qualitative procedure. Anomaly widths and positions are dictated by the dipole length and cannot be less than one dipole width as a narrow anomalous source can be located anywhere within the influence of the dipoles. Very narrow sources, relative to the dipole spacing, will have responses that are diluted and averaged over a large dipole distance.

Thus, detail profiling at shorter dipole configurations is necessary to accurately delineate the location of the anomaly source. A spacing of 25 m is considered a detailed survey configuration while a 100 metre spacing would be used for reconnaissance surveys. The larger spacing is suitable for evaluating large areas, locating the position of anomalous zones of interest and/or for delineating very large zones of mineralization.

SURVEY PARAMETERS AND PRESENTATION

The survey utilized the IPV4T receiver and IPT1 transmitter induced polarization equipment manufactured by Phoenix Geophysics Limited. (see instrument specifications Appendix I) The survey configuration consisted of a dipole-dipole electrode array with "n" spacings of 1, 2, 3, and 4. Reconnaissance profiles on lines 100 m apart and a dipole spacing of 50 m covered lines from 800 east to 1,600 east on the north grid and from 200 west to 2,200 east on the south grid.

Detailed 25 m dipole profiles were completed on lines 2,000 east to 2,300 east to cover an anomalous zone of interest from about 100 south to 500 south. A total of 30.5 line km of survey data at a dipole spacing of 50 m was collected which totalled approximately 2,100 readings. The additional 25 m dipole spacing survey work totalled 1.6 km or about 225 readings.

The results were machine plotted and contoured as pseudosections at a horizontal scale of 1:5,000 for dipole spacings of 50 m and a scale of 1:2,500 for dipole spacings of 25 m. These pseudosections are bound with this report (Appendix II). The sections consist of, from top to bottom, a resistivity plot in ohm-metres, a phase angle plot in milliradians and a metal factor plot. The phase angle is a measure of the polarizability of the material energized within the influence of the electrode array. The metal factor is a dimensionless quantity which accentuates low resistivity areas in addition to areas having coincident high phase angle values. The metal factor value is obtained by dividing the phase value by the resistivity value and multiplying by 100.

Induced polarization data in pseudosection format are difficult to present in a form that is comprehensible to the inexperienced interpreter or explorationist. Usually, anomalous

zones are designated by the geophysicist with a bar symbol and indicated on a plan map. Interpretation of the location of the anomalous responses of interest is a qualitative procedure. Anomaly widths and positions are dictated by the dipole length and cannot be less than one dipole width as a narrow anomalous source can be located anywhere within the influence of the dipole. Very narrow sources, relative to the dipole spacing, will have responses that are diluted and averaged over a large dipole distance. Thus, detail profiling at shorter dipole configurations is necessary to accurately delineate the locations of potential drill targets.

The anomaly locations, as interpreted from the pseudosections, are shown on the sections as bar anomalies. In some cases, in order to provide a more comprehensive presentation of the induced polarization/resistivity results, the average of a pyramid of values at each station is calculated, plotted and contoured on a plan map. Deep-seated anomalous responses are considerably attenuated or lost with this data manipulation technique and it is therefore necessary to show, in addition, the interpreted bar anomaly locations. The contoured averaged polarization values and anomaly locations are shown on plan maps at a scale of 1:5,000 located in a pocket at the back of this report. The maps also indicate the actual survey line coverage.

RESULTS AND CONCLUSIONS

Note: The anomaly amplitudes shown on the averaged polarization and resistivity plan maps will be usually less than seen on the pseudosections because of the averaging effect of the calculation. Therefore when describing maximum amplitudes the values will be taken from the pseudosections rather than the plan maps.

North Grid

Background polarization levels on this grid are in the order of about 2 to 5 milliradians (mrad). Anomalous levels are considered to be greater than 15 mrad with threshold or slightly anomalous values above 10 mrad. There is a broad complex anomalous zone in the southeast quarter of the grid which separates itself into three horizons starting on line 1,200 east. This is best illustrated on the plan map of the averaged polarization values. The most southerly and highest amplitude horizon stops abruptly on line 1,100 east while the other two horizons to the north continue westward although they are significantly attenuated past line 1,100 east. The northerly horizon is still present on the most westerly line 800 east. The abrupt termination of the south horizon anomaly and lower amplitude of the other horizons past line 1,100 east suggests a north-south to north-northeast fault structure may be present west of line 1,100. In fact such a fault was interpreted from the magnetic and geological information previously available.

The resistivity levels on this grid are very high with the lowest values in the range of 1,000 to 2,000 ohm metres increasing in some localities to over 20,000 ohm metres. The high resistivity is in part attributable to thin overburden cover but also must be related to

the physical properties of the underlying rock. Some degree of silicification or the presence of silica minerals may be in part responsible for the high resistivity values. Quartz monzonite and mafic to intermediate volcanic rocks outcrop over the survey area. Of definite interest is the very high resistivity anomaly at the south ends of lines 1,100, 1,200 and 1,300 east. This high resistivity zone correlates exactly with a very anomalous polarization response, of over 30 mrad, present on lines 1,200 and 1,300 east. This anomaly is part of the south horizon and has the highest amplitude polarization level on the survey grid.

The central horizon has polarization levels of 15 to 20 mrad with the north horizon slightly lower. Note the central horizon has a different resistivity signature. It corresponds to a relatively low resistivity horizon which trends through the grid. This horizon is underlain by intermediate to mafic volcanics containing magnetite mapped by a previous magnetic survey. The magnetite may be the source of the polarization response along this horizon.

North of the baseline the resistivity increases considerably to over 10,000 ohm metres. Quartz monzonite rocks predominate in this area and would explain the high resistivity here. The slightly anomalous polarization horizon flanks this high resistivity zone and may be related to minor pyrite mineralization along the contact with the volcanics.

Thus, all but one of the anomalous polarization horizons on this grid can be reasonably explained by geology. The anomaly at the south end of lines 1,100 to 1,300 east is the most significant response on the grid and requires an explanation.

South Grid

There are two levels of background polarization responses. North of the baseline levels are in the order of 2 to 8 mrad while to the south, values increase to about 10 to 12 mrad. There is a general increase in magnetic activity south of the baseline and this may explain the apparent increased polarization background. Threshold or marginal anomalies are considered to be those above about 15 mrad. Definite anomalous responses have amplitudes approaching or exceeding 20 mrad. There are only two locations where such amplitudes are present. The first location is in the south central part of the grid on lines 1,000 east to 1,200 east from about 350 south to 550 south. The averaged polarization map gives the best illustration of a large elliptically shaped anomaly. It has a coincident, very high amplitude, resistivity component of over 50,000 ohm metres. This location was tested by an old 1946 drill hole and is just south of a carbonated alteration zone carrying values in gold.

The second anomaly is a one line, very narrow feature, on line 2,000 east from 300 south to 350 south. The zone is defined by only one set of dipole values but is associated with a low resistivity response of less than 1,000 ohm metres. The area was profiled just to 325 south on line 1,900 east. The suggestion of the start of an anomalous response is present on the last values on the line and helps support the credibility of the anomaly on

line 2,000 east. There are no anomalous values on line 2,100 east but a weak marginal anomaly is present on line 2,200 east from 200 south to 250 south. The detailed 25 m dipole survey work in this area failed to detect any significant polarization responses. The original anomalies were confirmed but much lower polarization amplitudes, near threshold values, were registered.

Based on the magnetic patterns and amplitudes these IP anomalies fall along or near a probable contact zone and may be reflecting narrow seams of fine grained pyrite mineralization associated with the contact zone. Minor amounts of pyrite or graphite within narrow lenses of interflow sediments could also produce the responses.

RECOMMENDATIONS

North Grid

The polarization anomaly at the south end of lines 1,100 to 1,300 east is recommended for investigation. It is the most significant response encountered within either the north or south grids and requires an explanation. Detailed IP profiling may help to delineate a more specific target zone but, for the present, exploration by trenching or drilling of the high amplitude polarization zone on line 1,200 east from about 250 south to 300 south is suggested.

South Grid

Of the two anomalous responses of possible interest on this grid the largest, at the south end of lines 1,000 to 1,300 east, has been tested by an old 1946 drill hole. There are no assay values available for this hole and the value of an ounce of gold at that time was very low compared to today's prices. Prospecting of the area near the peak of the anomaly uncovered a small dyke of felsite quartz porphyry containing disseminated pyrite. This would explain the IP response but the extensive size of the anomaly suggests a large siliceous body containing disseminated pyrite is present. As the anomalous area is just south of a gold showing further evaluation of this anomaly is definitely warranted. If stripping of the area is not practical then two drill holes are recommended to cross-section the anomaly on line 1,100 east from about 400 south to 500 south.

The other anomaly on line 2,000 east is of less interest because the detailed IP profiling indicated very little polarizable material is present here. The associated low resistivity response is thought to be in part a small swampy area just to the north of the anomaly location. The shallow nature of the low resistivity source was confirmed by the detailed work. Therefore this area is not considered very prospective and is considered a very low priority objective.

R. W. Woolham, P. Eng.
Pickering, Ontario
October 10, 1996

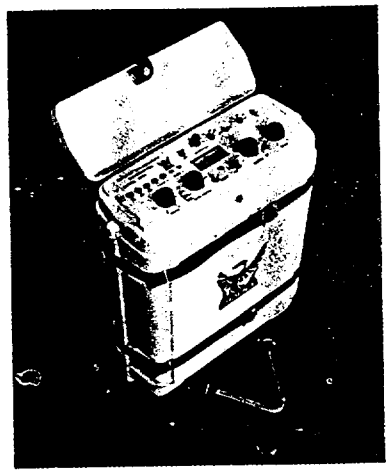
APPENDIX I

INSTRUMENT SPECIFICATIONS

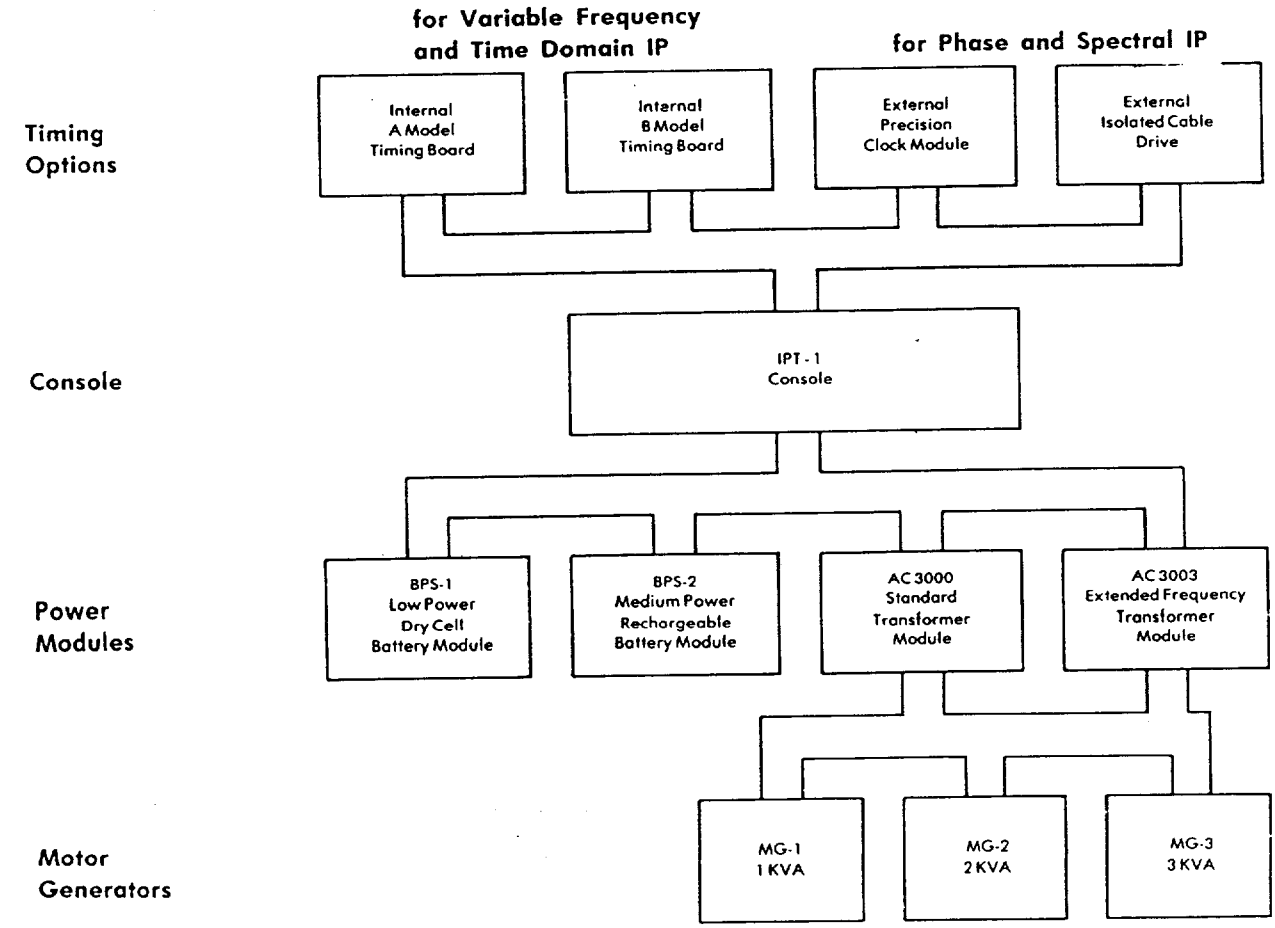
IPT-1

Variable Frequency, Time Domain and Phase IP Transmitter

- **Reliable:** Backed by twenty years experience in the design and worldwide operation of induced polarization and resistivity equipment
- **Versatile:** Can be used for resistivity, variable frequency IP, time domain IP or phase angle IP measurements
- **Stable:** Excellent current regulation
- **Lightweight, portable**
- **Wide selection of power sources**
- **Low cost**



Transmitter Configurations



PHOENIX GEOPHYSICS LIMITED

Geophysical Consulting and Contracting, Instrument Manufacture, Sale and Lease.

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Tel.: (416) 493-6350 Telex: 06-986856 Cable: PHEXCO TORONTO

Vancouver Office: 214 - 744 West Hastings Street, Vancouver, B.C., Canada V6C 1A6
Tel.: (604) 669-1070

Denver Office: 4891 Independence St., Suite 270, Wheat Ridge, Colorado, 80033, U.S.A.
Tel.: (303) 425 9393 Telex: 450590

Timing Options

INTERNAL TIMING BOARD

There are three available internal timing boards. Both have the same internally mounted crystal oscillator with a stability of 50 PPM over the temperature range -40°C to +60°C.

Model A :

STANDARD FREQUENCY SERIES
Frequency domain mode
±DC, .062, .125, .25, 1, 2 and 4 Hz.
Time domain mode
2 sec +, 2 sec off, 2 sec -, 2 sec off.
Simultaneous transmission mode
.25 and 4.0 Hz standard, other pairs available.

OPTIONAL FREQUENCY SERIES (change link on board)
Frequency domain mode
±DC, .078, .156, .313, 1.25, 2.5, and 5.0 Hz.
Time domain mode
1.6 sec +, 1.6 sec off, 1.6 sec -, 1.6 sec off.
Simultaneous transmission mode
.313 and 5.0 Hz standard, other pairs available.

Model B : The main difference between this timing board and the model A board is that the duty cycle is variable. Frequency domain operation is obtained by setting the duty cycle to 100% and selecting any of nine binary frequencies from 1/64 Hz to 4 Hz. Various time domain waveforms may be obtained by choosing any of the nine frequencies and a duty cycle of 25%, 50% or 75%. The standard 2 sec +, 2 sec off, 2 sec -, 2 sec off time domain waveform is chosen by selecting a duty cycle of 50% and a frequency of .125 Hz.

Model C : Time domain: 1, 2, 4, 8 second cycle. Frequency domain: 0.1, 0.3, 1.0, 3.0 Hz.

EXTERNAL HIGH PRECISION CRYSTAL CLOCKS

The IPT-1 may be driven by external high precision crystal clock modules such as the CL-1 and transmitter driver or CL-2 and transmitter driver. These clock modules were designed for use as a time reference between the IPT-1 or IPT-2 transmitters and the Phoenix IPV-2 phase IP receiver. The aging rate of the CL-1 clock module is 5×10^{-10}/day (0.11 mrad/hr at 1 Hz) and the stability of the CL-2 clock module is 10^{-7}/day (2.26 mrad/hr at 1 Hz). These clock modules weigh 7.5 kg., however space is provided for as much as 5 kg of additional internal batteries for operating the CL-1 oven heated clocks all day at -40°C. Clock modules produced by other manufacturers of induced polarization receivers are also compatible with the IPT-1.

EXTERNAL ISOLATED CABLE DRIVE

The isolated cable drive option allows the IPT-1 to be driven by the timing circuitry of the IPV-3 spectral IP receiver. The maximum distance allowed between transmitter and receiver is 500m. For efficient spectral IP field surveying, the distance between the transmitter and receiver is always maintained at one electrode interval. Thus the maximum convenient electrode interval, using the isolated cable drive option, is 500m. The IPV-3 measures the current plus six voltage dipoles (n = 1,6) simultaneously.

Console

Ammeter Ranges : 30 mA, 100 mA, 300 mA, 1A, 3A and 10A full scale.

Meter Display : A meter function switch selects the display of current level, regulation status, input frequency, output voltage, control voltage and line voltage. An optional digital display presents all of the above, plus external circuit resistance.

Current Regulation : The change in output current is less than 0.2% for a 10% change in input voltage or electrode impedance.

Protection : The current is turned off automatically if it exceeds 150% full scale or if it is less than 5% full scale.

Internal Power Modules

BPS-1 DRY CELL BATTERY POWER MODULE

Output Voltage : 90V, 180V and 360V.

Output Current : 1 mA to 1A maximum.

Output Power : Recommended maximum output power is 30 watts. Absolute maximum output power is 100 watts.

Power Supply : 8x45V dry cell batteries (Eveready 482, Mallory 202 or equivalent). Normal field operation, with low output power, results in an average battery life expectancy of one month. Operation with the absolute maximum output power results in much shorter battery life.

Control Supply : 4 x 6V lantern batteries (Eveready 409, Mallory 908 or equivalent) connected in series/parallel are used to provide the 40 to 70 mA at 12V required for the control circuitry. Average battery life expectancy is six months.

Operating Temperature : 0°C to +60°C.

BPS-2 RECHARGEABLE BATTERY POWER MODULE

Output Voltage : 50V, 106V, 212V, 425V, and 850V.

Output Current : 3 mA to 3A.

Output Power : Maximum output power is 300 watts. Above this output power a protective cut-out is engaged to prevent battery and circuit damage.

Batteries : 4 x 12V rechargeable gell cell batteries connected in series/parallel have a capacity of 9 A-hr. External batteries (such as car or motorcycle batteries) may also be used. A special cord and plug are provided for this mode of operation. An adaptor cord connects the 12V batteries in parallel with the 12V charging unit.

Operating Temperature : -40°C to +60°C. Below 0°C the capacity of the batteries is significantly reduced (by 70% at -40°C).

AC 3000 TRANSFORMER POWER MODULE

Output Voltage : 75V, 150V, 300V, 600V and 1200V.

Output Current : 3 mA to 10A.

Output Power : Maximum continuous output power is
3KW with MG-3 motor generator,
2KW with MG-2 motor generator and
1KW with MG-1 motor generator.

Input Power : Three phase, 400 Hz (350 to 1000 Hz), 60V (50V to 80V) is standard.
Three phase, 400 Hz (350 to 1000 Hz), 120V (100V to 160V) is optional.

Current Regulation : Achieved by feedback to the alternator of the motor generator unit.

Operating Temperature : -40°C to +60°C.

Thermal Protection : Thermostat turns off at 65°C and turns back on at 55°C internal temperature.

AC 3003 TRANSFORMER POWER MODULE

Same as AC 3000 except for:

Output Voltage : 44V, 87V, 175V, 350V and 700V.

Frequency Range : DC to 3000 Hz under external drive (all other power modules have a maximum frequency of 5 Hz).

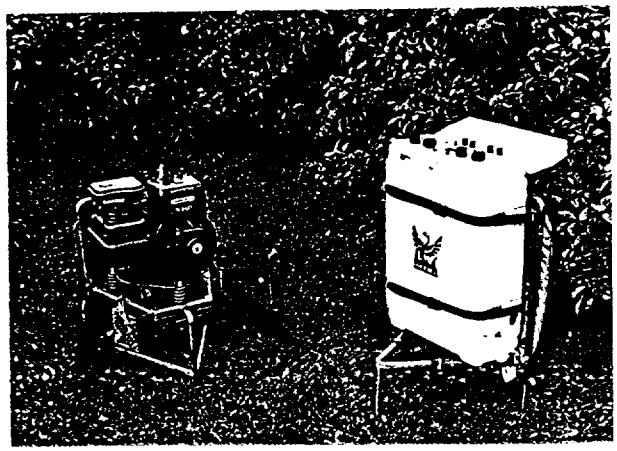
(Note: AC 3003 is not intended for extended time domain operation)

General

Dimensions : 20 x 40 x 55 cm (9 x 16 x 22 in).

Weight : 13 kg (29 lb) with BPS-1.
13 kg (29 lb) with BPS-2.
17 kg (37 lb) with AC-3000.
18 kg (40 lb) with AC-3003.

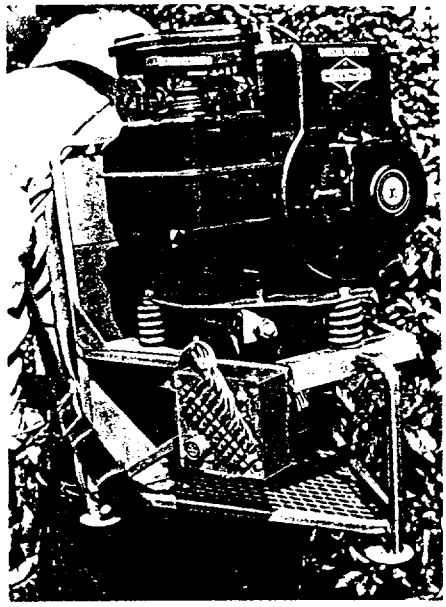
Standard Accessories : Pack frame, manual. At least one of the four possible power modules is required. The transformer power modules in turn require one of the three external 1KVA, 2KVA, 3KVA, motor generators and a connecting cable.



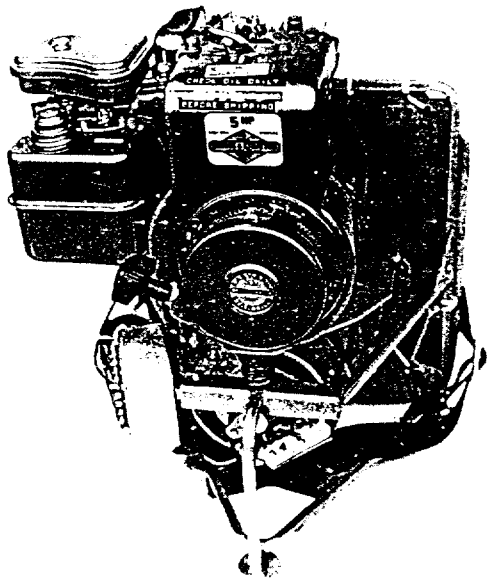
Motor Generators

There are three motor generators, differing in weight and power, which can be used with the transformer power modules. All three supply three phase, 400 (350 to 600 Hz), 60V (45V to 80V). The voltage is regulated by feedback from the transmitter.

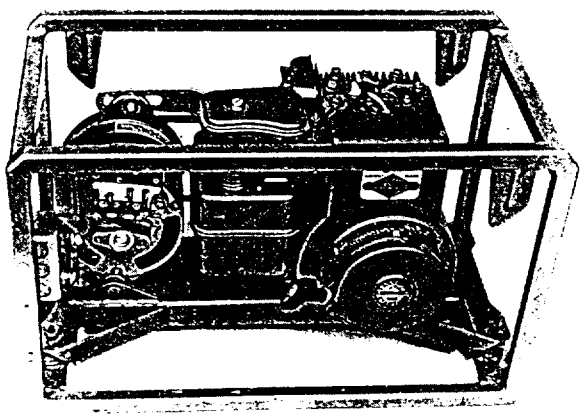
MG-1: This lightweight unit is designed for easy portability in areas of moderately high resistivity. It is well suited for massive sulfide exploration in Northern Canada, Europe and Asia, as well as general IP and resistivity surveys in rugged, mountainous areas around the world. The motor is a 4-cycle Briggs and Stratton which produces 3 HP at 3600 rpm. The dimensions of the unit, including packframe, are 40 x 45 x 60 (16 x 18 x 24 in). Total weight is 25 kg (55 lb).



MG-2: 2KVA motor generator. This versatile unit is adequate for the vast majority of IP and resistivity surveys conducted worldwide. It is light enough to be carried by one man, yet powerful enough for most survey requirements. The motor is a 4-cycle Briggs and Stratton which produces 5 HP at 3600 rpm. The dimensions of the unit, including packframe, are 40 x 45 x 60 cm (16 x 18 x 24 in). Total weight is 34 kg (75 lb).



MG-3: 3KVA motor generator. This two-man portable unit is designed for surveys in areas which require additional power. The motor is a 4-cycle Briggs and Stratton which produces 8 HP at 3600 rpm. The unit is mounted in a square frame with dimensions 40 x 48 x 75 cm (16 x 19 x 29 in). Total weight is 55 kg (120 lb).



TEM-V4

A NEW DIMENSION IN INSTRUMENTATION

PHOENIX

Cost-effectiveness through multiple functions: five controlled-source geophysical techniques plus generalized data acquisition/ processing/ control in a rugged, battery-powered, portable package.

The Turbo V4 is an upgraded version of the V4 receiver, with a new, high-performance CPU board.

The Turbo V4 processor is 50 times faster than the original V4 processor, and features nes as much ROM/RAM memory for stored programs and data.

Programs for the Turbo V4 are written in high-level languages; the data processing is therefore much more efficient and intelligent than on the old CPU, which used assembler language only.

Also, the new CPU is programmable*. Users can develop their own programs in FORTRAN or C language using the IBM PC (or compatible), then download them into the V4. This capability means the V4 will remain up-to-date for years, and can be matched precisely to the user's applications.

* Optional.

SPECIFICATIONS

Analog Section

Number of channels	2, 4, 6 or 8 (in pairs)
Dynamic range	± 10 volts
Frequency range	1024 sec to 4 kHz (SIP); 4 sec to 4 kHz (CSAMT) in binary or 2/3 binary steps.
Input Impedance	More than 100 megohms at low frequencies.
Powerline filtering	Triple notch 40 db powerline filter for 1/3/5 harmonics of 50/60 Hz. Switchable in/out.
Other filtering	Bad sample rejection; offset adjustment; programmable anti-alias filters; slope correction (TDIP) all under processor and/or manual control.
Gain	Automatic or manual control, range of 1 to 640.
DC offset	Processor controlled DC offset control, range: ± 2.5 volts.
Calibration	Manual external calibration; processor-controlled, internal calibration with built-in calibration/test signals: 1/128 Hz to 4 kHz ±5 v, 200 ohm impedance; 50% or 100% duty cycle.
Sensitivity	Sufficient for stand alone controlled source applications.

Digital Section

Processor/CPU board	32/16 bit NS32C016 with NS32081 maths coprocessor. Clock rate 6-10 MHz. Programmable interrupt controller with 16 request lines. MULTIBUS interface. DIN connectors. On-board real time clock.
Monitor firmware	Monitor firmware interfaces to National 32000 series software development tools. Also provides run time environment, terminal handler, debugger execute module, floating point support module and interrupt handler.
Applications firmware	Initially offered with geophysical applications firmware, for IP in time, frequency, or phase domain; spectral IP; resistivity; and CSAMT. Other offerings (such as FDEM) may become available from time to time. The user may develop proprietary applications in FORTRAN 77, PASCAL or C on VAX, IBM PC or compatibles and download into the V4.
CPU board memory	Up to 576 Kbyte RAM + 320 Kbyte ROM.
Serial I/O	Optional RS-232 port with selectable baud rate. Can drive RS-232 printer.
Parallel I/O	8 bit port with max 1/2 MHz transfer rate. For vest-pocket printer or external computer.
Timing	Internal crystal clock; processor-controlled resetting for synchronized operation with transmitters. Optional external precision clock.
A-D conversion	16-bit resolution, 12.5 kHz conversion rate.

Mechanical

Weight	approx. 13 kg
Dimensions	32 × 36 × 27 cm high
Case	resilient, tough PVC alloy
Connectors	3 multipin connectors for analog inputs, 2 of which have power for external sensors.

Environmental

Operating temperature	−10°C to +50°C (−20°C with LCD heater)
Storage temperature	−50°C to +60°C
Humidity	Splashproof, may be operated in light rain
Shock and vibration	Suitable for transport in bush vehicles.

Battery

12 v / 6 Ah rechargeable battery. Nominal 10 h continuous operation at +20°C. Provision for external 12V battery supply.

Inputs

Signal channel	Three multipin connectors for 8 analog inputs. (6 + 1 + 1)
Battery	Multipin connector for external battery or for charging of the internal battery @ 12 V, approx 1.2 A.
Remote clock signal	Optional input.
Current Monitor	Twin plugs for RF modulated signal from transmitter (for real-time deconvolution)

Outputs

Analog meters	Eight analog meters
Display	16 char × 4 lines LCD
Analog outputs	8 outputs for analog recorders, etc. ±5V range. (Optional)
External isolated transmitter drive	Via special purpose isolated RF link.
Calibration signal	Twin connectors

Switches and Controls

Keyboard	20-key alphanumeric/command keypad (waterproof).
On/off	2 position rotary.
Meter Mode	2 position toggle, AC or DC
Battery test	2 position toggle.
Input Select	2 position rotary

Note : Specifications subject to change. Customized configurations are available.

		MT*	AMT*	CSAMT	IP TIME DOMAIN	IP PHASE/ FREQUENCY DOMAIN	RESISTIVITY	EM TIME * DOMAIN	EM FREQUENCY DOMAIN	DATA ACQUISITION CONTROL	USER-PROGRAMMABLE FUNCTION
Geophysical Applications	OIL & GAS			•	•	•	•		•		•
	GROUND WATER			•			•		•		•
	METALLIC MINERALS			•	•	•	•		•		•
	GEOTHERMAL EXPLORATION			•			•		•		•
	HAZARDOUS WASTE			•	•	•	•		•		•
	ENGINEERING GEOPHYSICS			•			•		•		•
General Applications	SCIENTIFIC RESEARCH & TRAINING			•	•	•	•		•	•	•
	INDUSTRIAL						•			•	•
	MILITARY										

*Not implemented

PHOENIX Geophysics Limited

3781 VICTORIA PARK AVENUE, UNIT #3
SCARBOROUGH, ONTARIO, CANADA M1W 3K5
TELEPHONE: (416) 491-7340 FAX: (416) 491-7378

APPENDIX II

INDUCED POLARIZATION PSEUDO-SECTIONS

(See Appendix C)

APPENDIX III

CERTIFICATE OF QUALIFICATION

I, Roderick W. Woolham of the town of Pickering, Province of Ontario, do hereby certify that:-

1. I am a geophysicist and reside at 1463 Fieldlight Blvd., Pickering, Ontario, L1V 2S3

2. I graduated from the University of Toronto in 1961 with a degree of Bachelor of Applied Science, Engineering Physics, Geophysics Option. I have been practising my profession since graduation.

3. I am a member in good standing of the following organizations: Professional Engineers Ontario (Mining Branch); Society of Exploration Geophysicists; South African Geophysical Association; Prospectors and Developers Association of Canada.

4. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the properties or securities of The Oliver Group or any affiliate.

5. The statements contained in this report and the conclusions reached are based upon evaluation and interpretation of the induced polarization data and information and maps supplied by Ralph Stewart, a consultant for The Oliver Group.

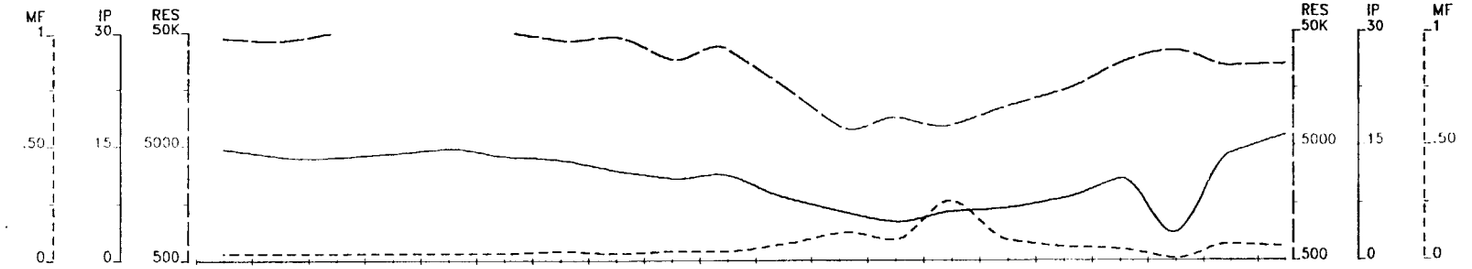
6. I consent to the use of this report in submissions for assessment credits or similar regulatory requirements.

R. W. Woolham, P.Eng.

Pickering, Ontario

October 10, 1996

R. W. WOOLHAM
REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO



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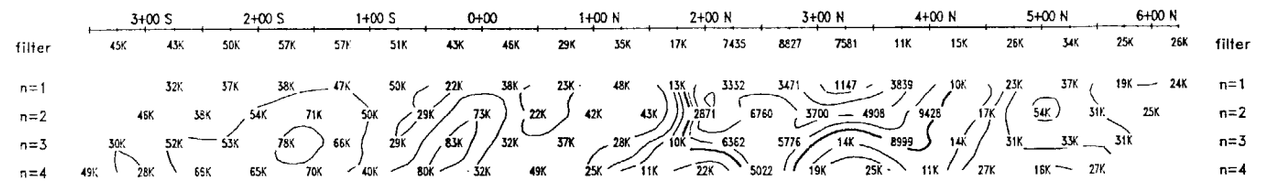
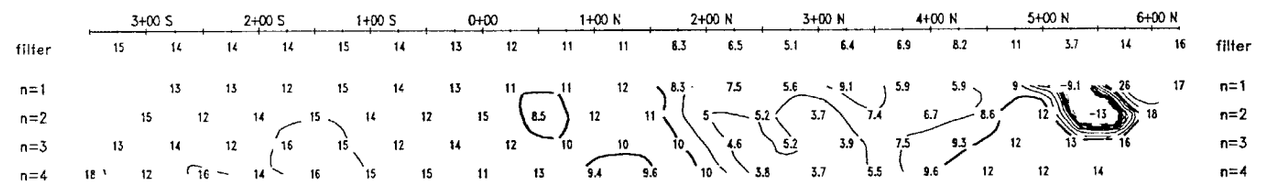
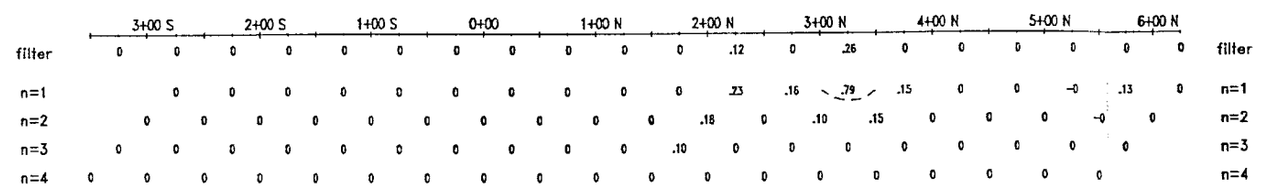


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

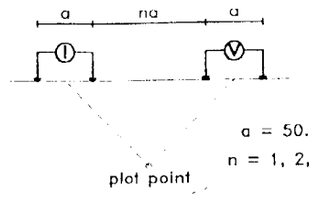
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 200 W

Dipole–Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

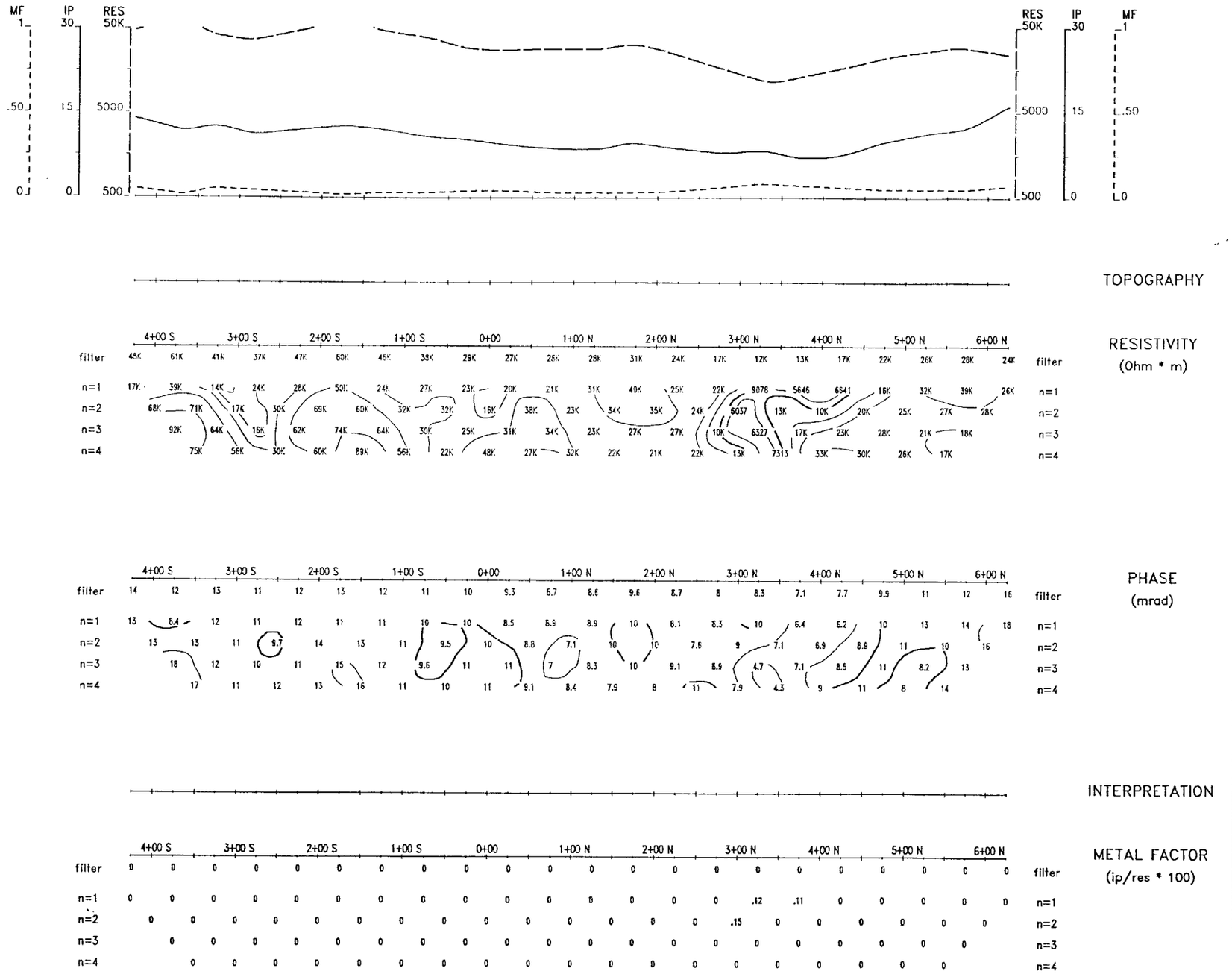
Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

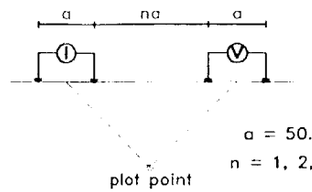
Date: 96/08/17
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



Line 100 W

Dipole–Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

- Increase in polarization associated to a relative decrease in apparent resistivity.
- Increase in polarization with little or no associated decrease in apparent resistivity.
- Weak or poorly defined polarization anomaly,no resistivity signature.
- Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

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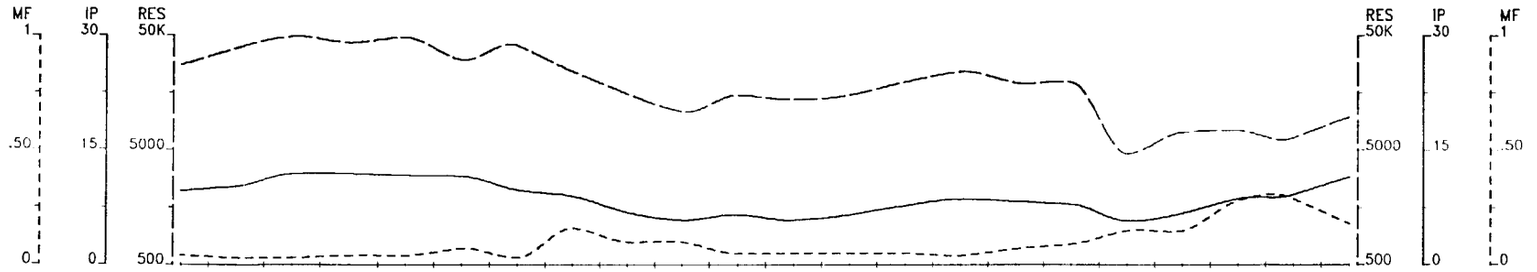

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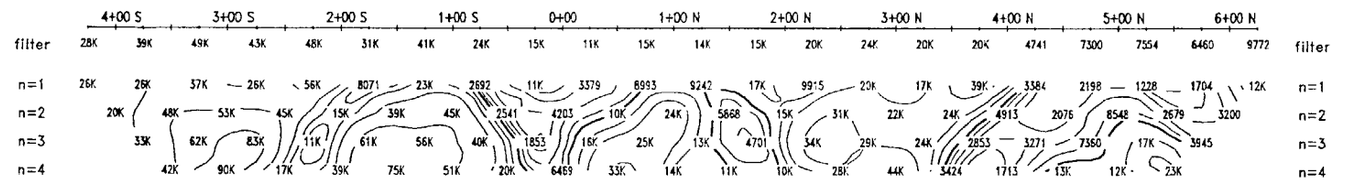
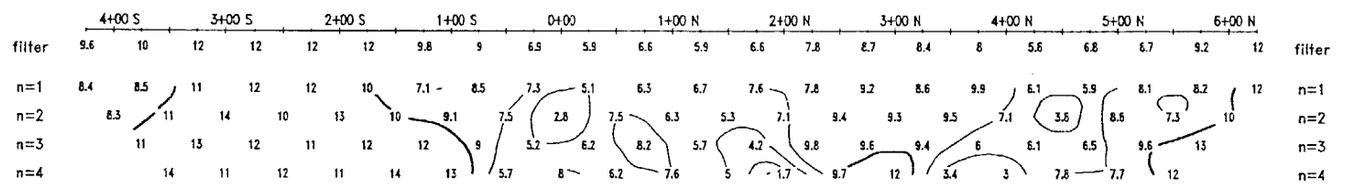
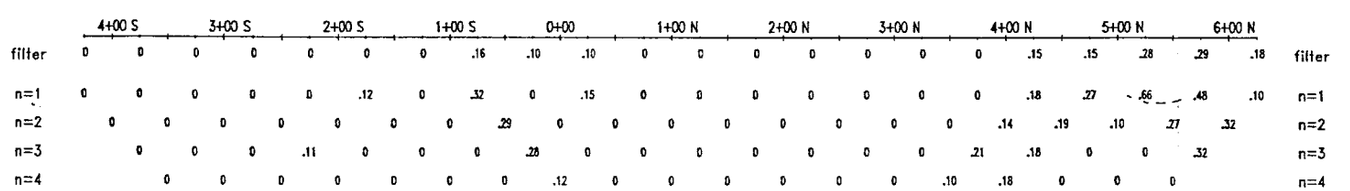


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

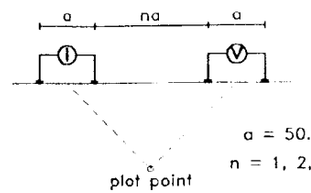
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 0

Dipole–Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

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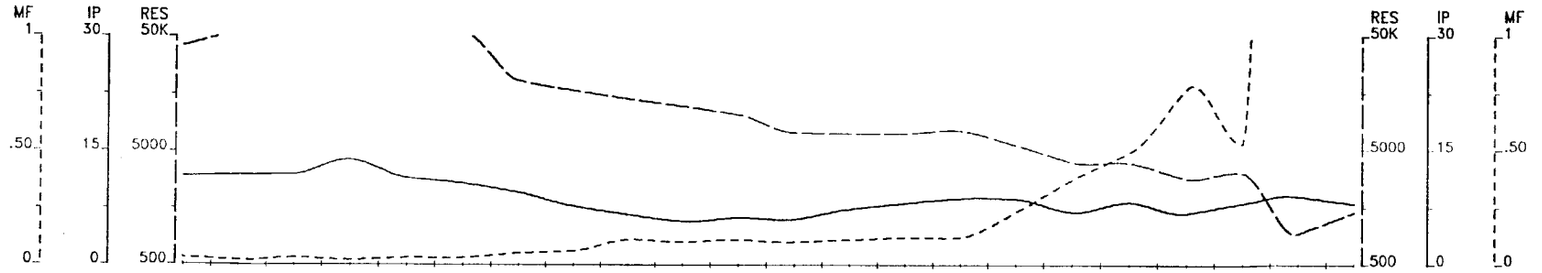
Compiled by: VAL D'OR SAGAX INC.



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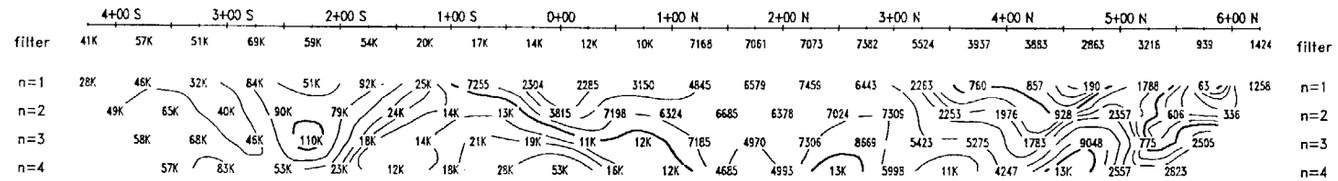
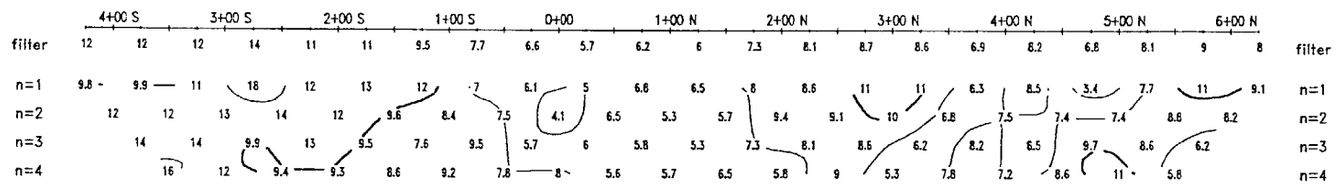
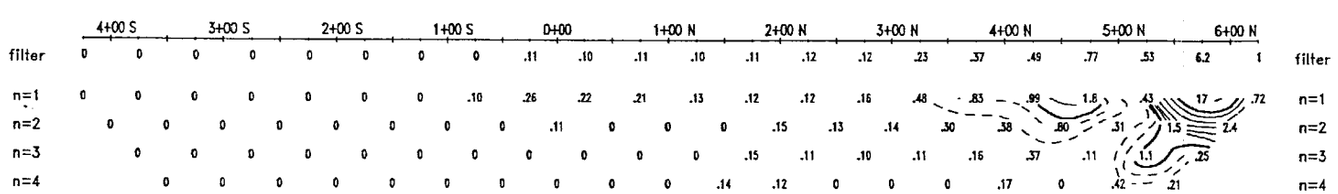


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

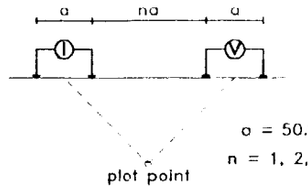
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 100 E

Dipole–Dipole Array



Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

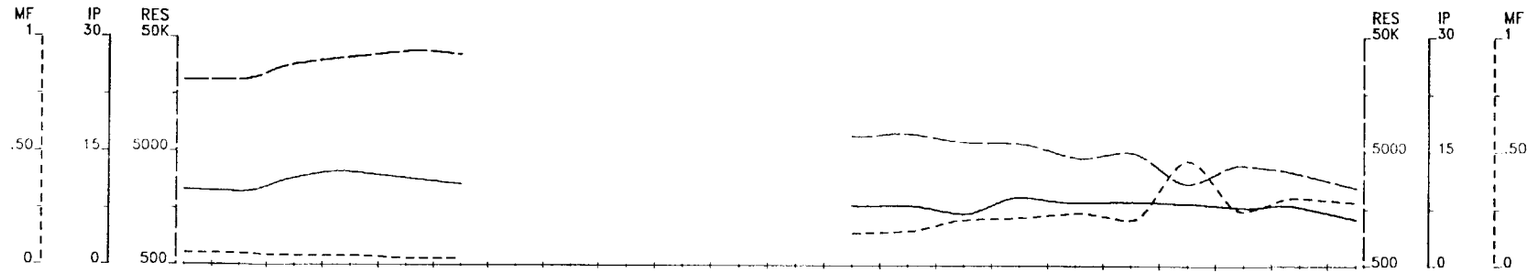
Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



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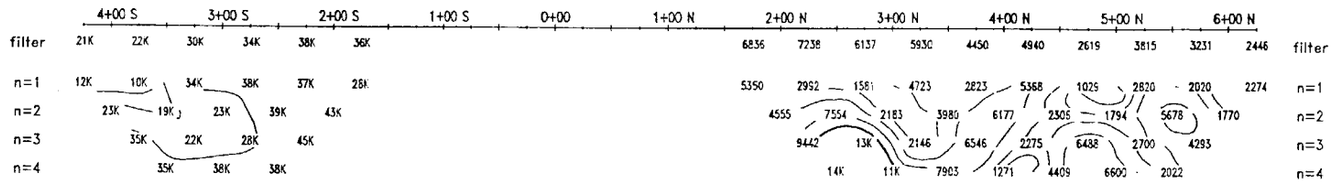
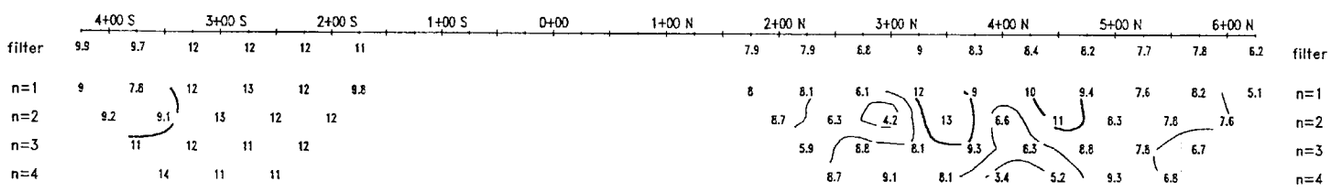
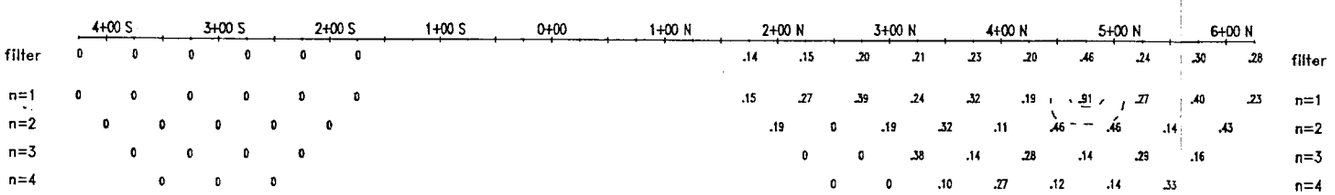


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

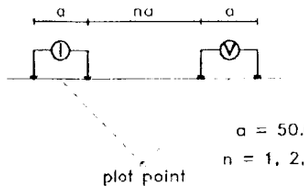
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 200 E

Dipole–Dipole Array



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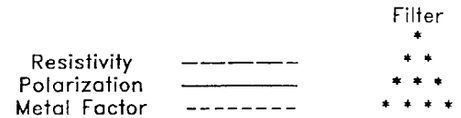

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

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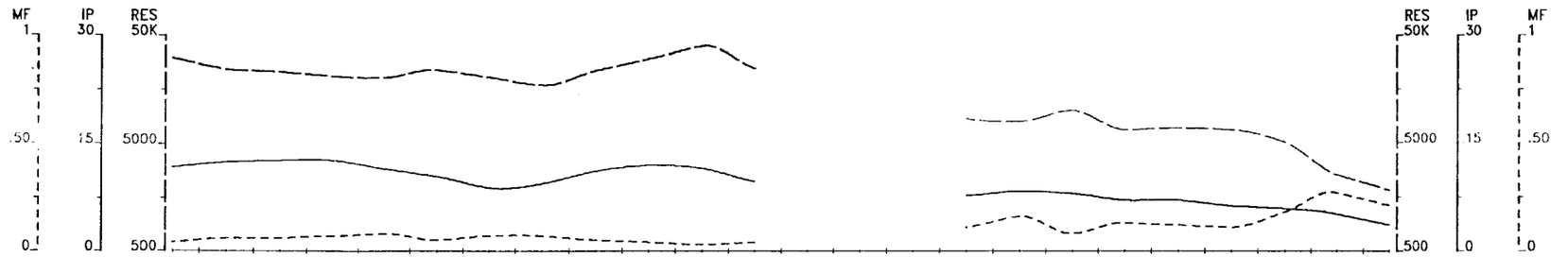
Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



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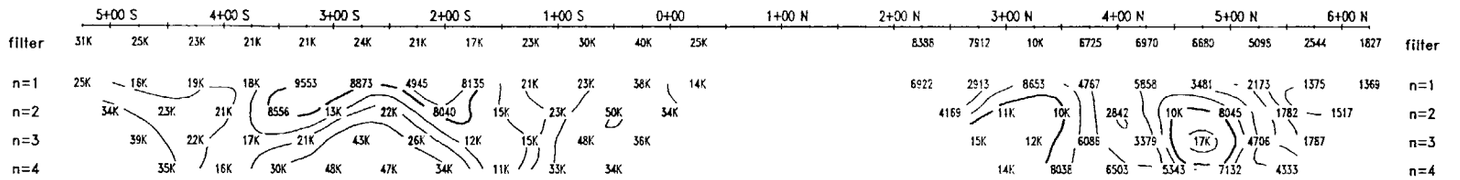
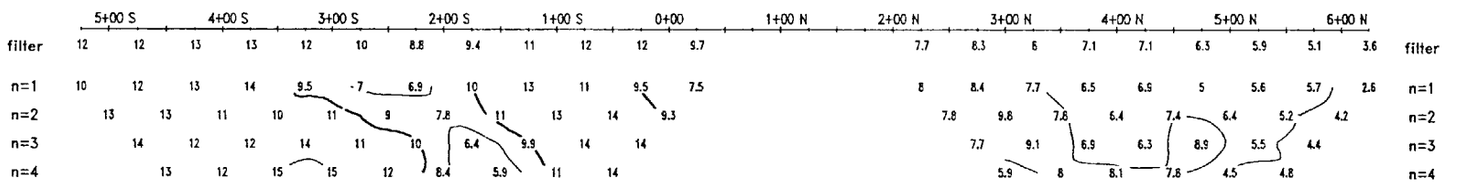
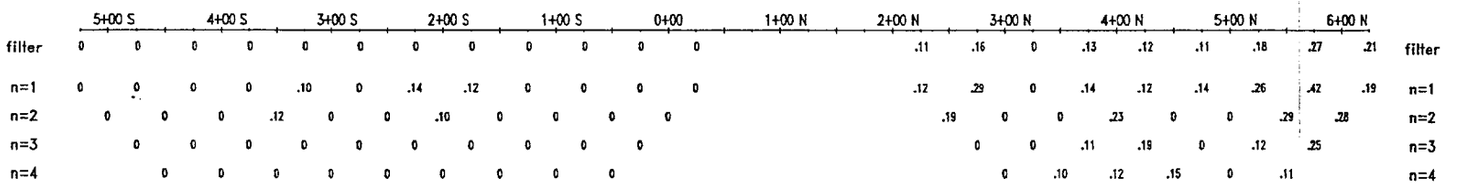


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

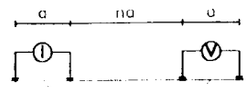
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 300 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4
plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

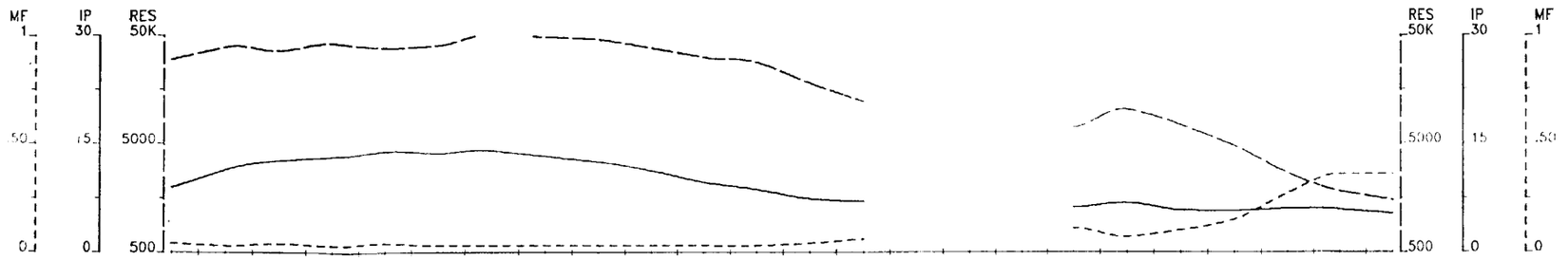
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

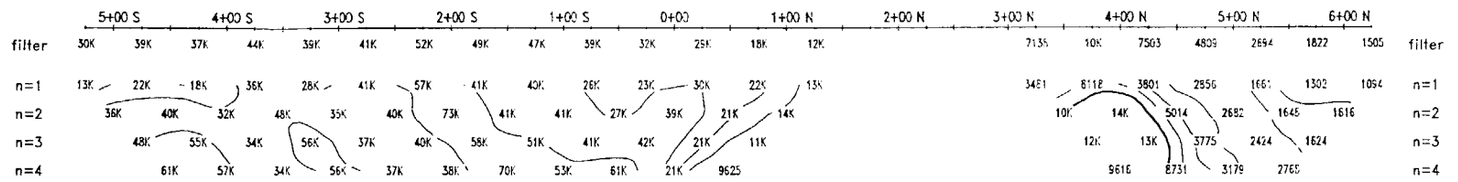
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

Software for the Earth Sciences

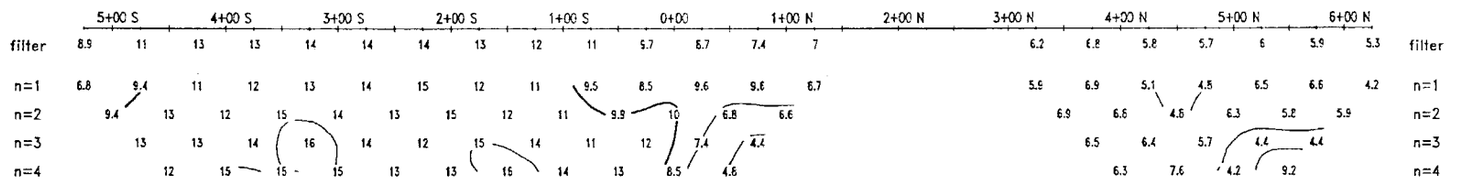
96-N02B



TOPOGRAPHY

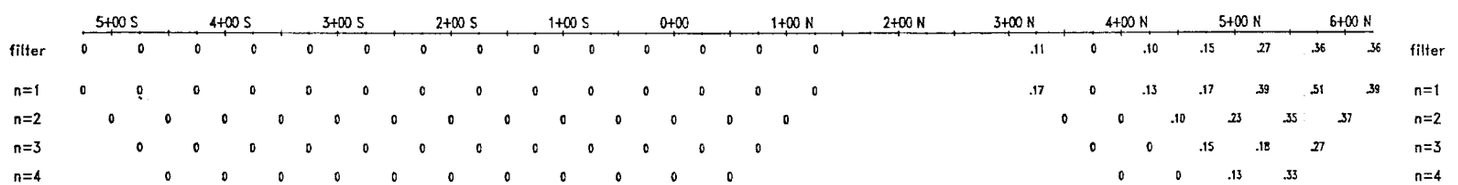


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

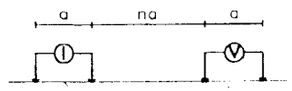
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 400 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

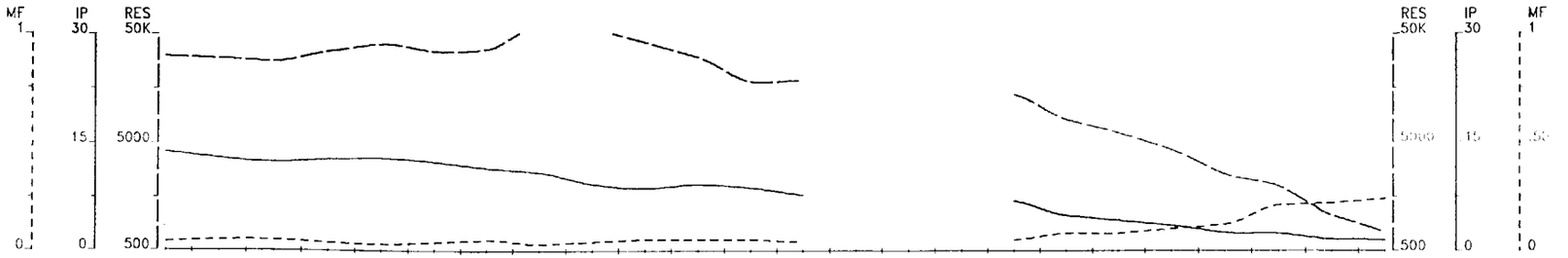
Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

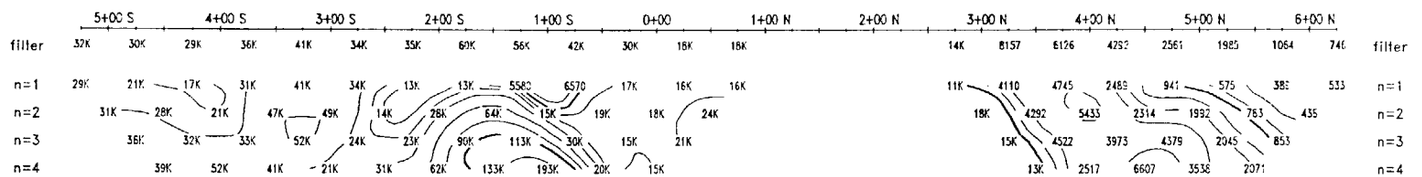
Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

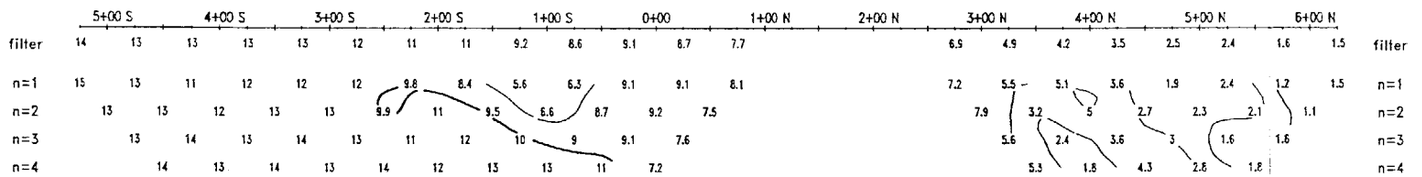


TOPOGRAPHY

RESISTIVITY (Ohm * m)

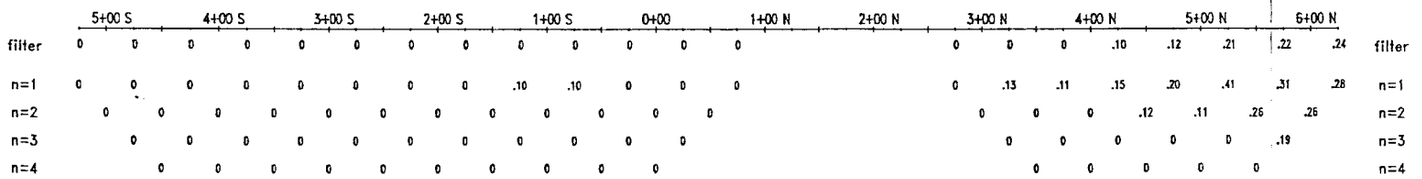


PHASE (mrad)



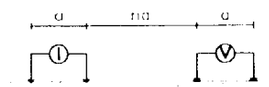
INTERPRETATION

METAL FACTOR (ip/res * 100)



Line 500 E

Dipole–Dipole Array



a = 50.0 M
n = 1, 2, 3, 4
plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

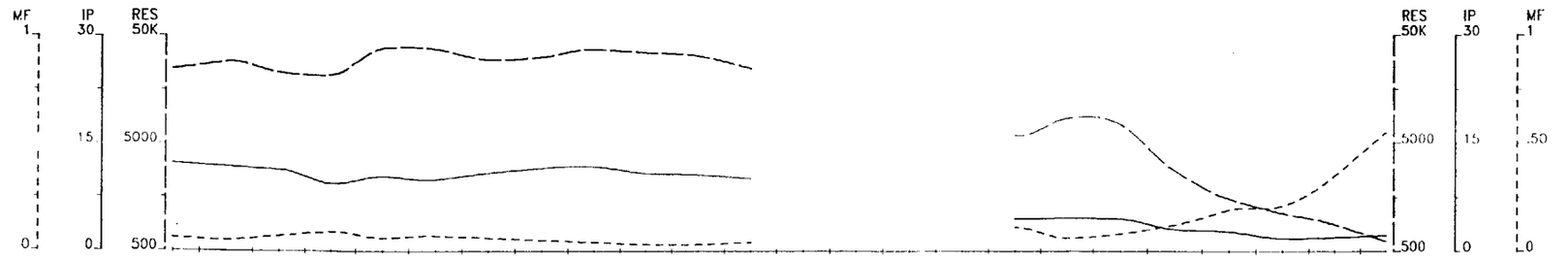
Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP
Showing South Block
Mc Neil Township

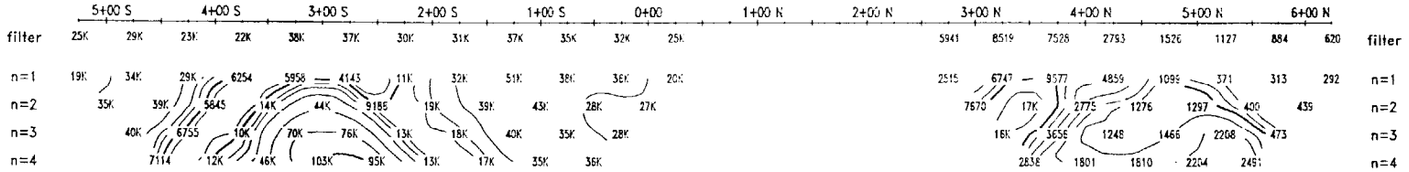
Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

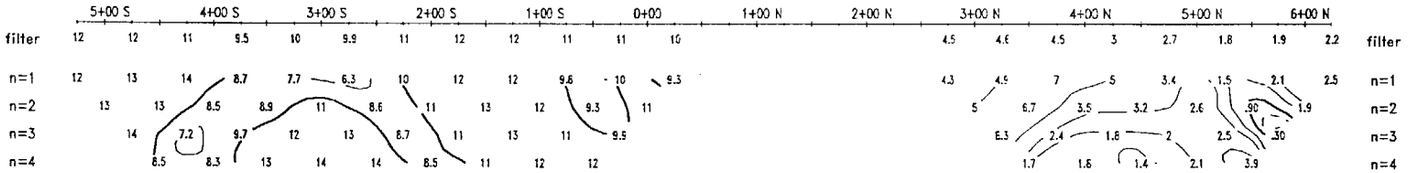


TOPOGRAPHY

RESISTIVITY
(Ohm * m)

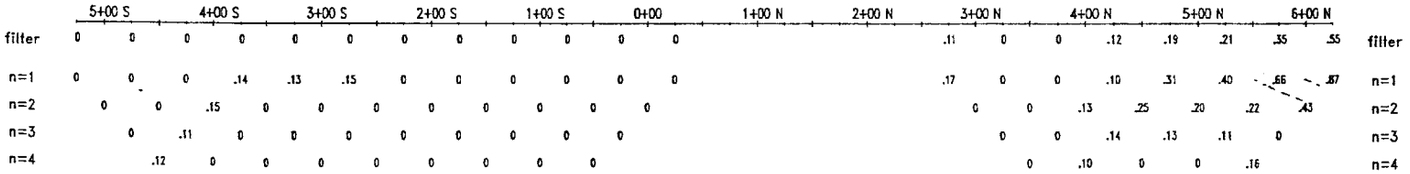


PHASE
(mrad)



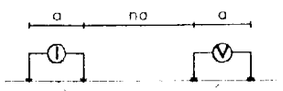
INTERPRETATION

METAL FACTOR
(ip/res * 100)



Line 600 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4
plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor
Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

Software for the Earth Sciences

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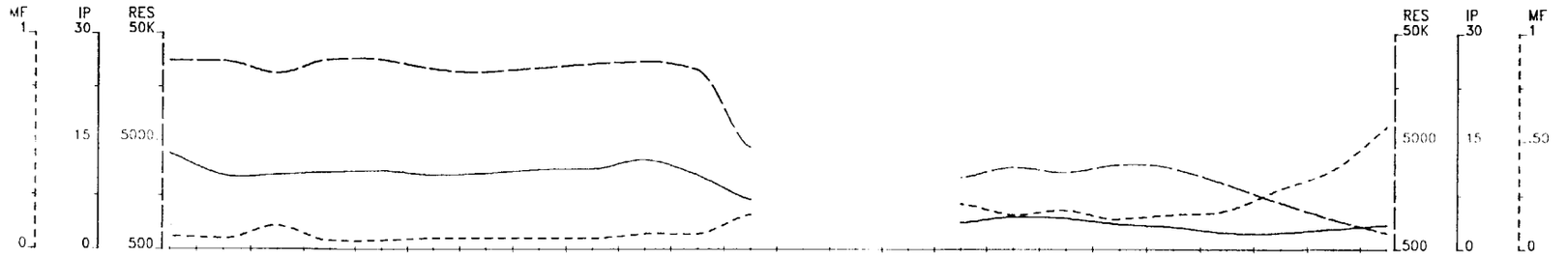
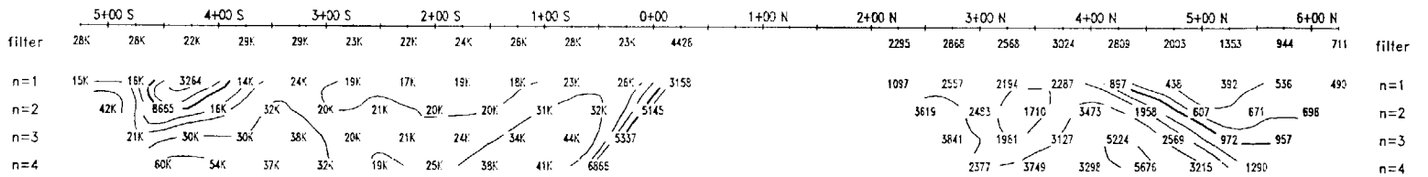
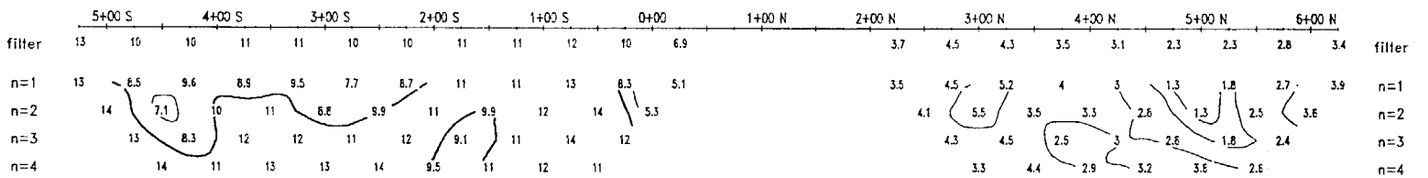


TOPOGRAPHY

RESISTIVITY
(Ohm * m)

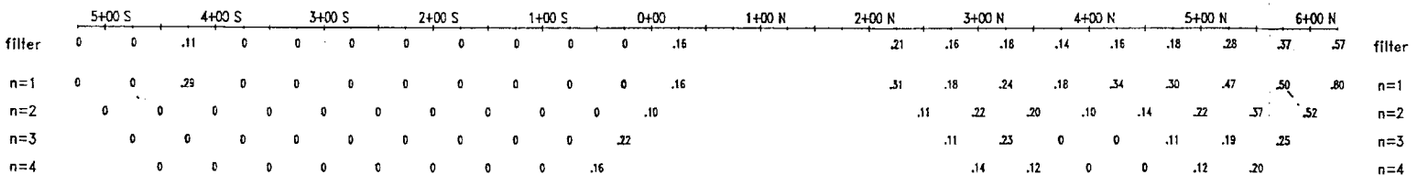


PHASE
(mrad)



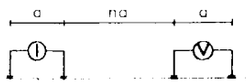
INTERPRETATION

METAL FACTOR
(ip/res * 100)



Line 700 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4
plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

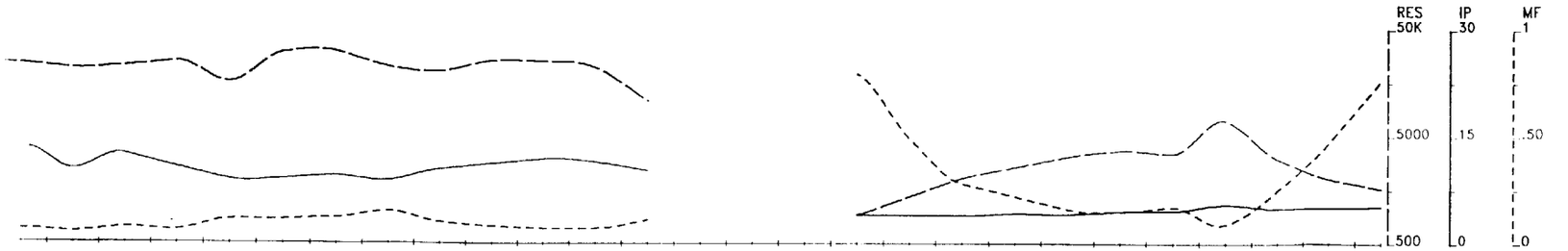
Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

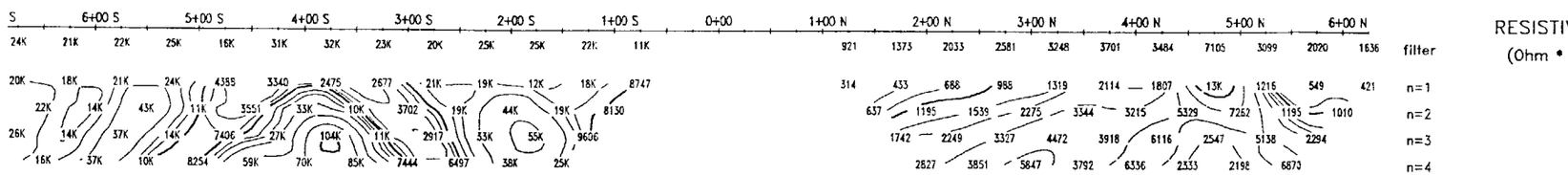
THE OLIVER GROUP
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

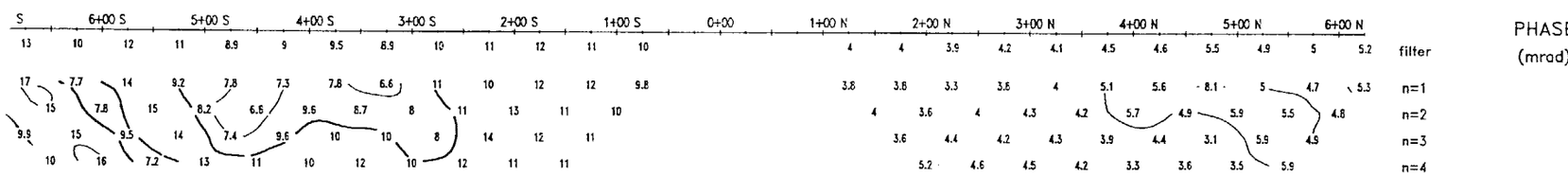
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

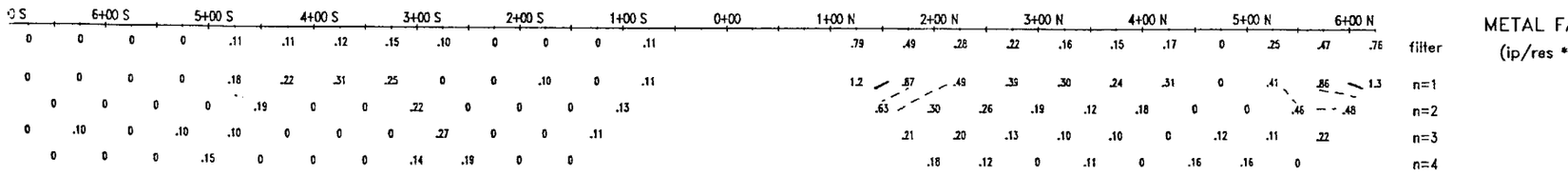


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

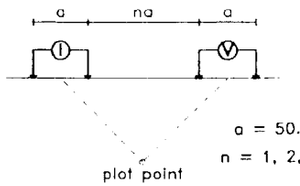
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 800 E

Dipole–Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomoly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

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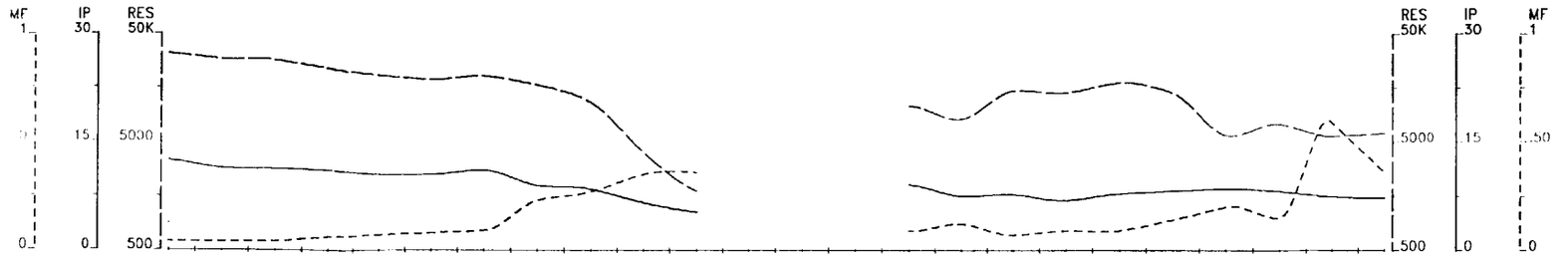
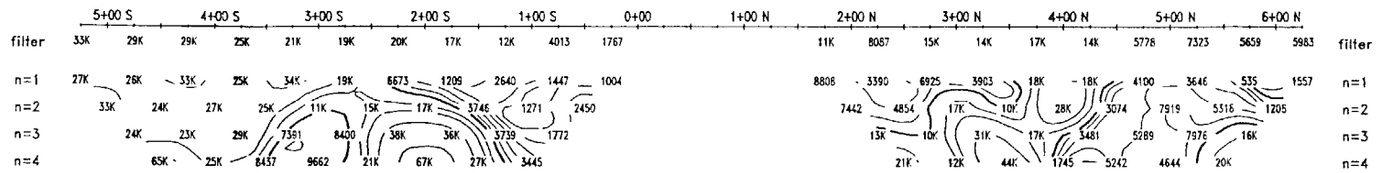
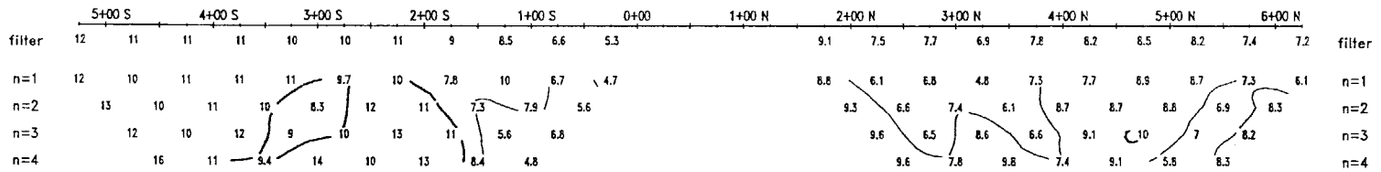
96-N028



TOPOGRAPHY

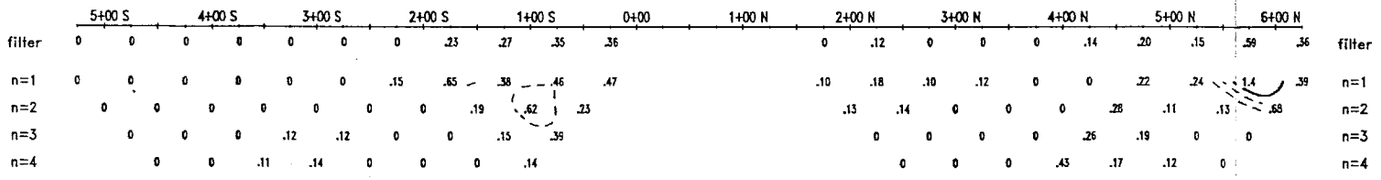


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

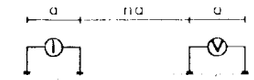
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 900 E

Dipole–Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

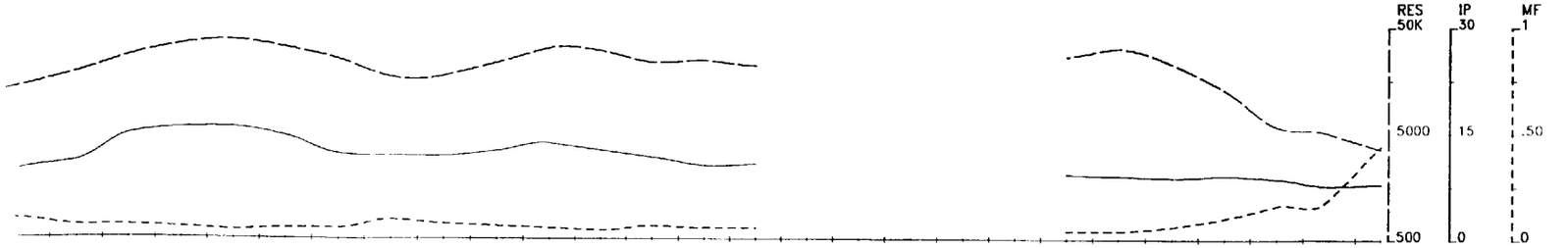
Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

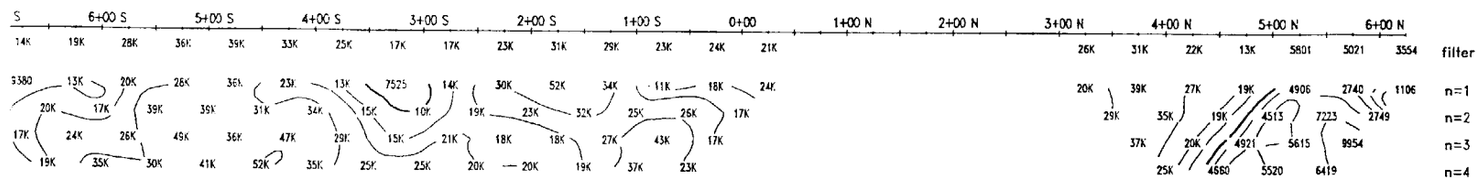
THE OLIVER GROUP
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

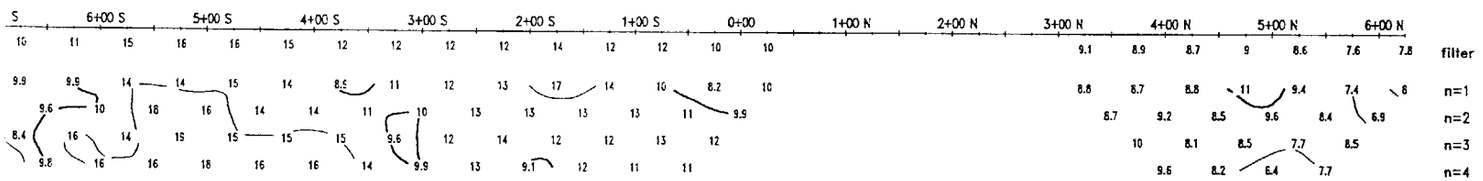
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

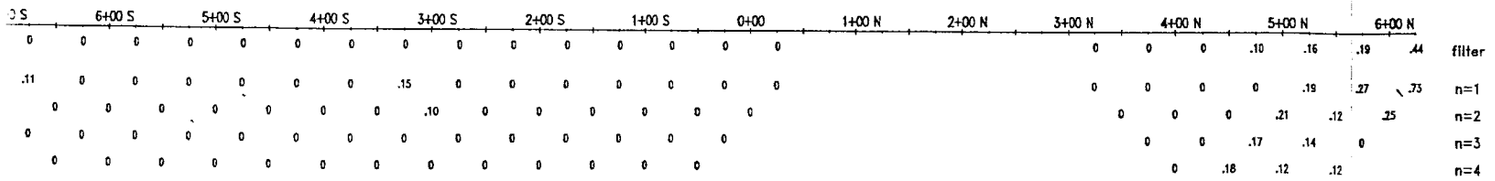


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

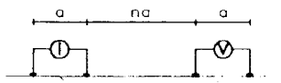
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1000 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

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Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

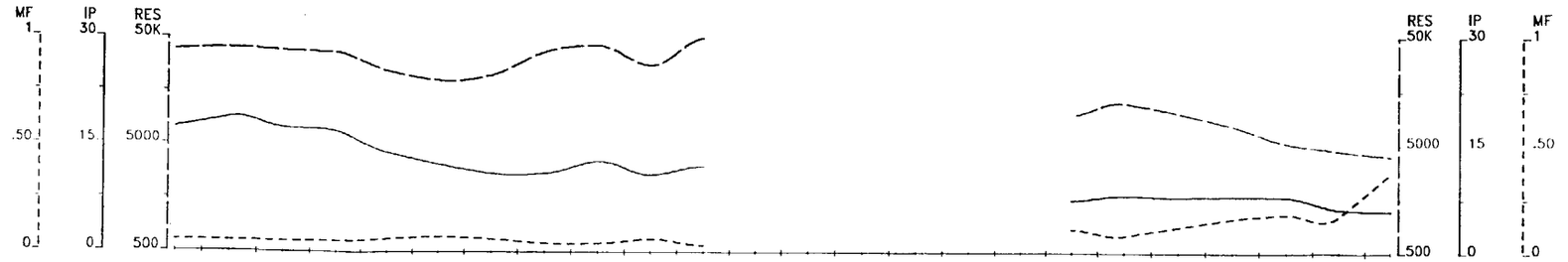
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

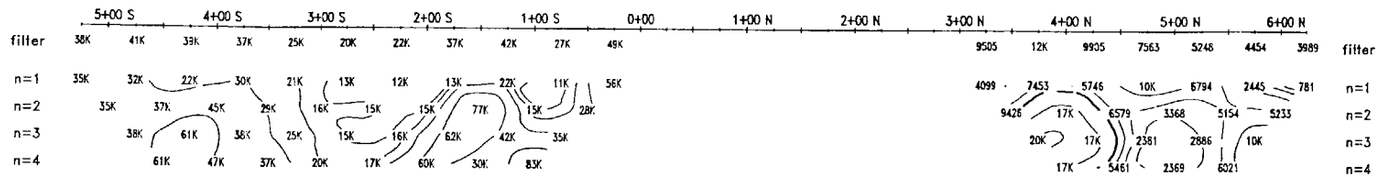
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

nces

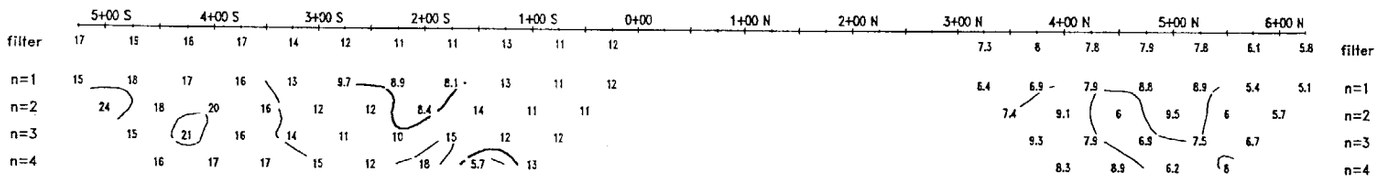
96-N028



TOPOGRAPHY

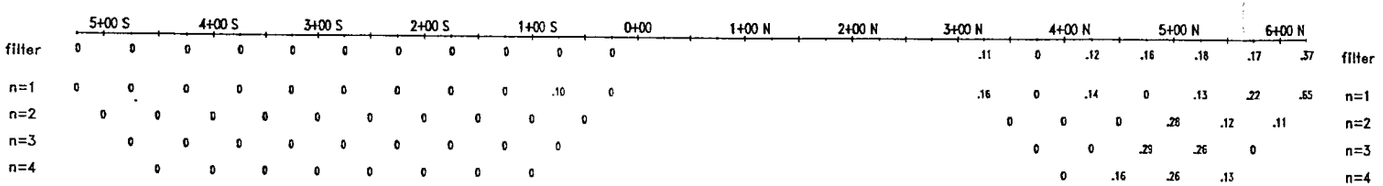


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

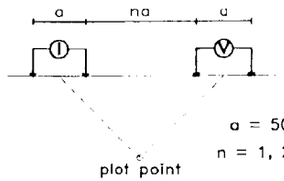
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1100 E

Dipole-Dipole Array



Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

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Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

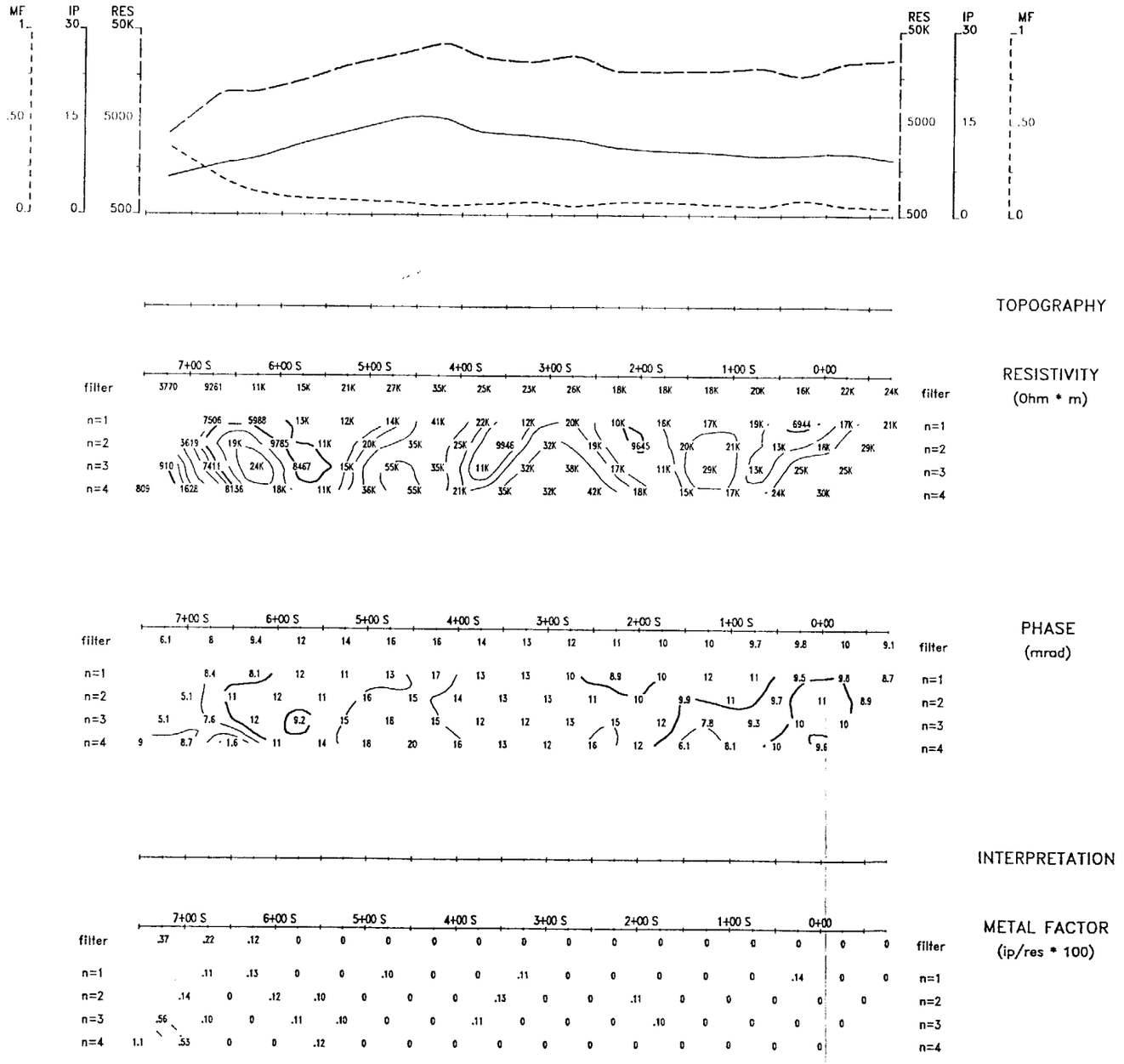
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

Software for the Earth Sciences

96-N028



Line 1200 E

Dipole-Dipole Array

a = 50.0 M

n = 1, 2, 3, 4

plot point

Filtered Profiles

Filter

Resistivity

Polarization

Metal Factor

Logarithmic Contours

1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

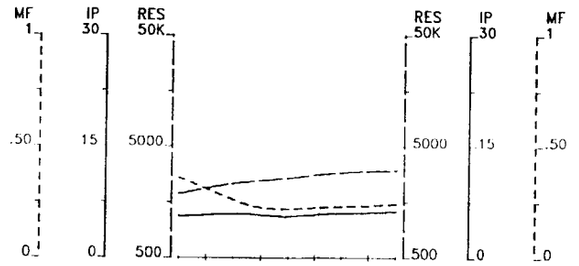
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

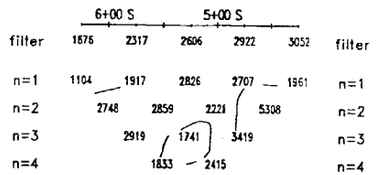
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

Geosoft Software for the Earth Sciences

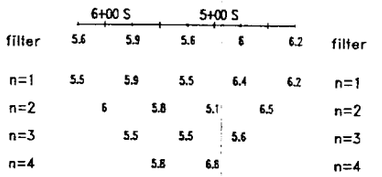
96-N028



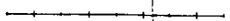
TOPOGRAPHY



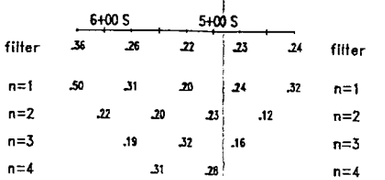
RESISTIVITY
(Ohm * m)



PHASE
(mrad)



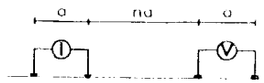
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1300 E

Dipole–Dipole Array



a = 50.0 M
n = 1, 2, 3, 4
plot point

Filtered Profiles

		Filter
Resistivity	————	* *
Polarization	————	* * *
Metal Factor	- - - - - - - -	* * * * *

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

- Increase in polarization associated to a relative decrease in apparent resistivity.
- Increase in polarization with little or no associated decrease in apparent resistivity.
- Weak or poorly defined polarization anomaly,no resistivity signature.
- Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

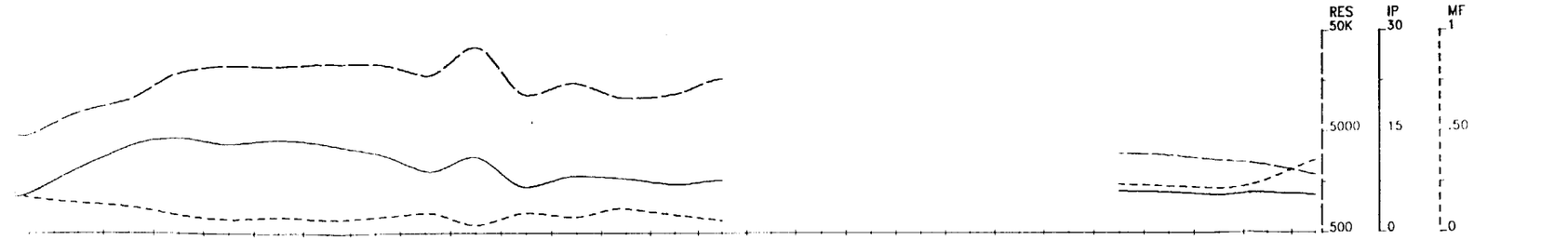
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

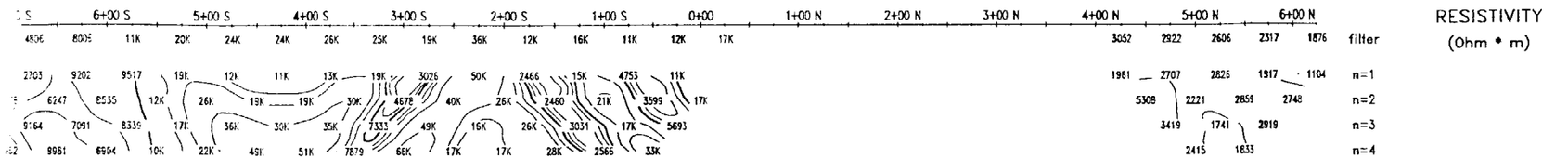
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

Geosoft Software for the Earth Sciences

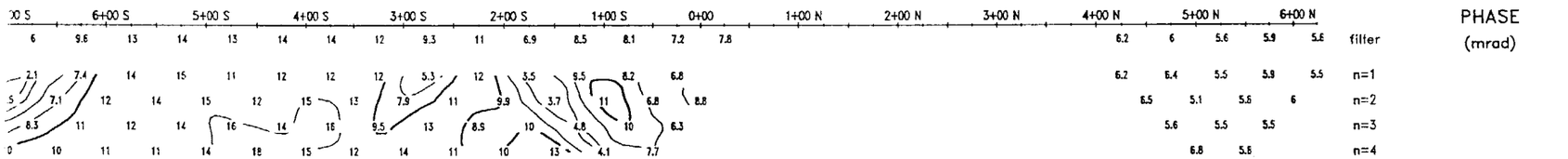
96-N028



TOPOGRAPHY

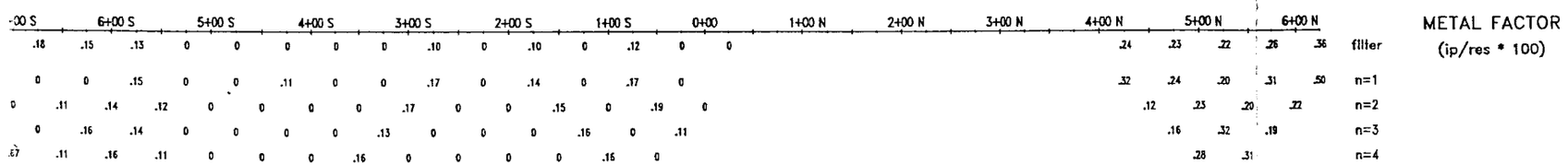


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

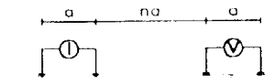
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1300 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

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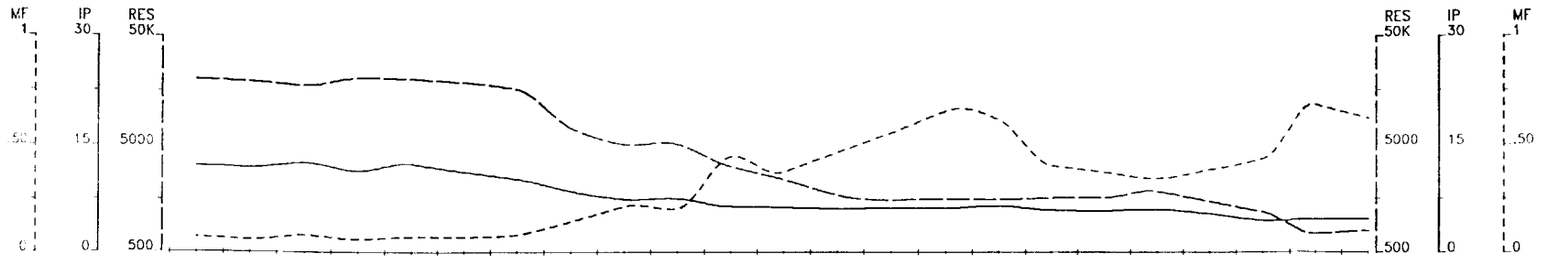
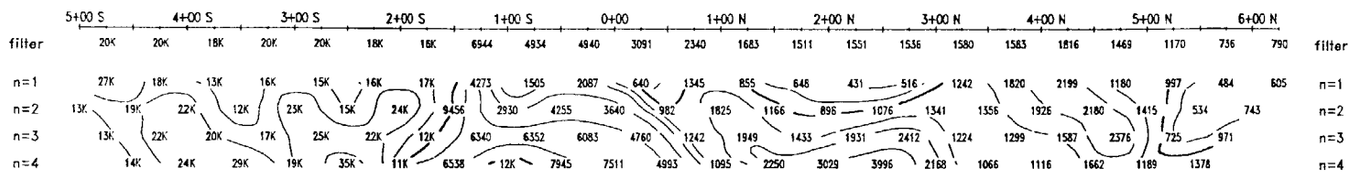
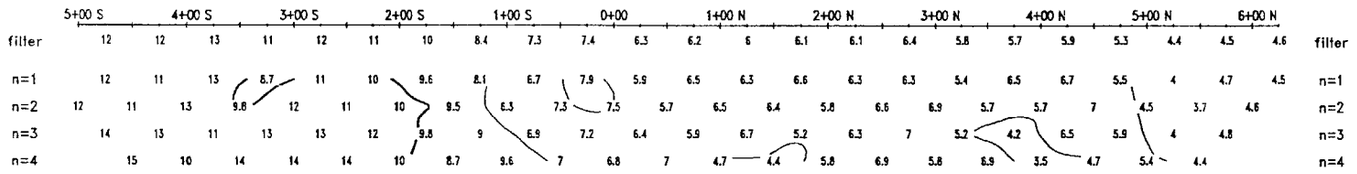


TOPOGRAPHY

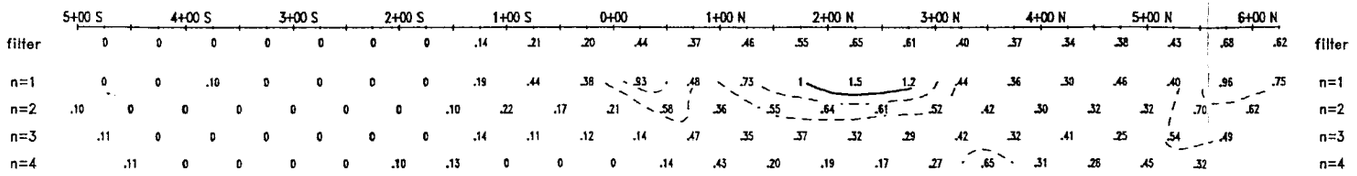


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

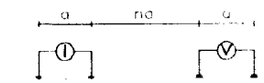
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1400 E

Dipole–Dipole Array



a = 50.0 M
n = 1, 2, 3, 4
plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

▼ Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

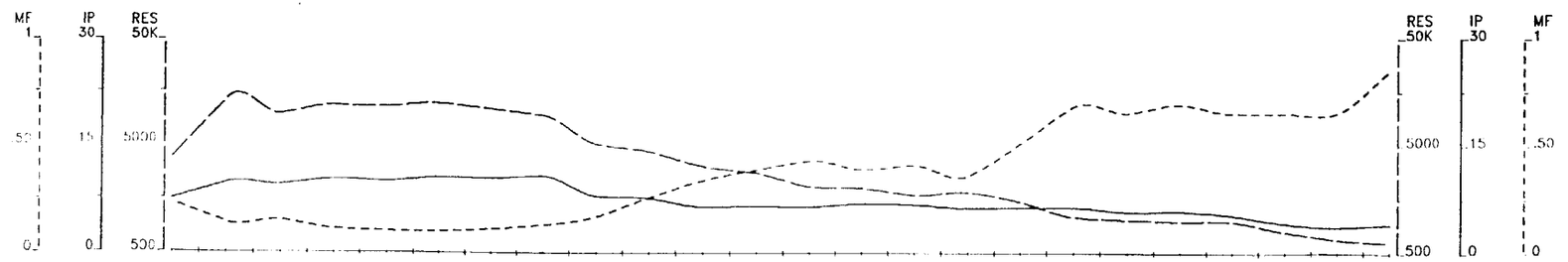
Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

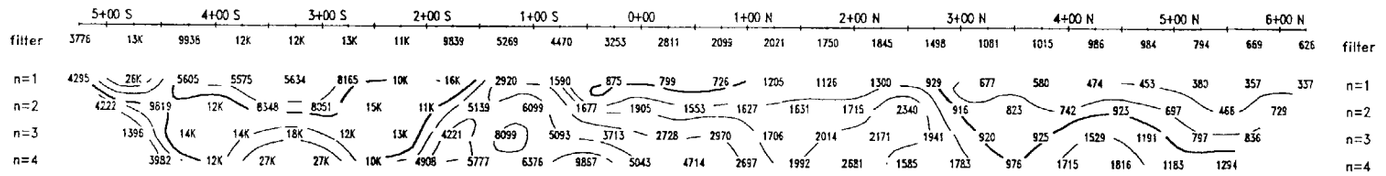
Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

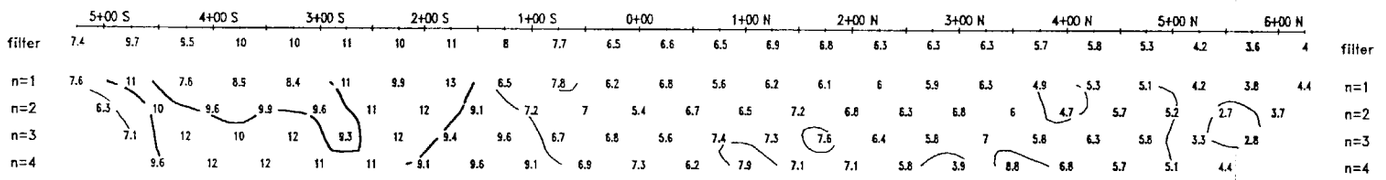


TOPOGRAPHY

RESISTIVITY (Ohm * m)

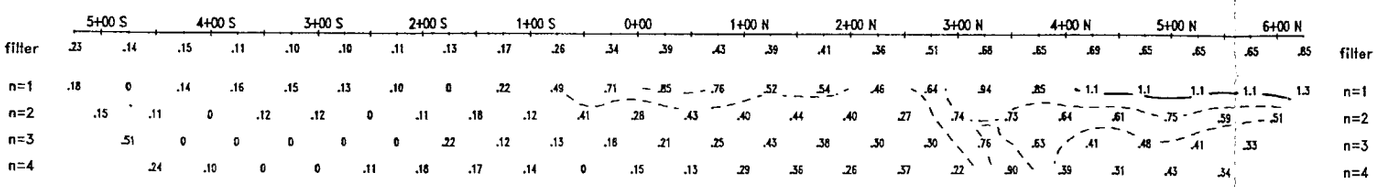


PHASE (mrad)



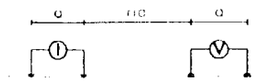
INTERPRETATION

METAL FACTOR (ip/res * 100)



Line 1500 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

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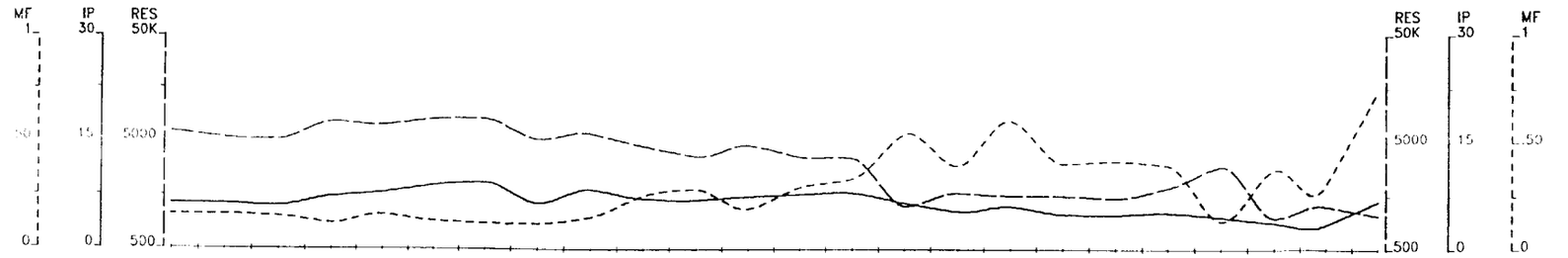
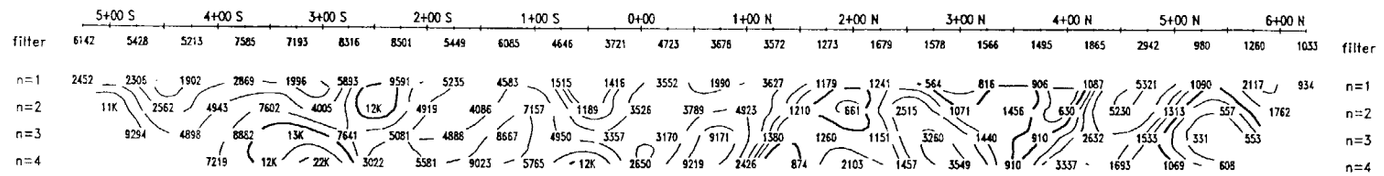
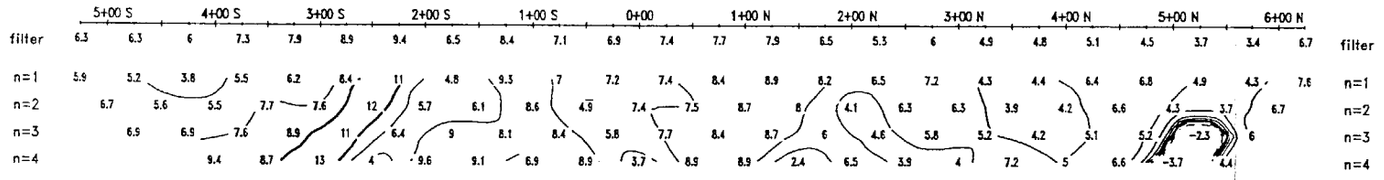


TOPOGRAPHY

RESISTIVITY
(Ohm * m)

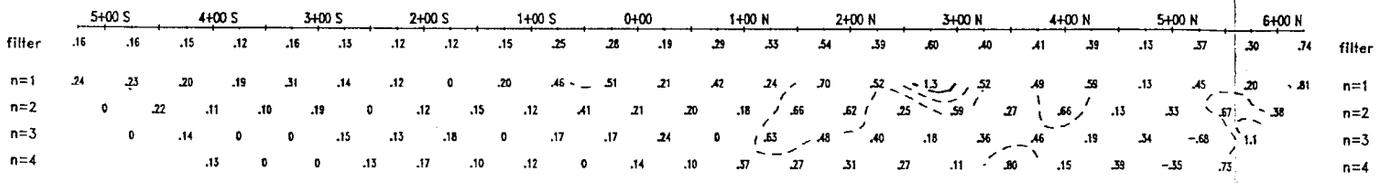


PHASE
(mrad)



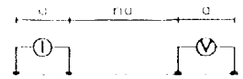
INTERPRETATION

METAL FACTOR
(ip/res * 100)



Line 1600 E

Dipole-Dipole Array



o = 50.0 M
n = 1, 2, 3, 4
plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

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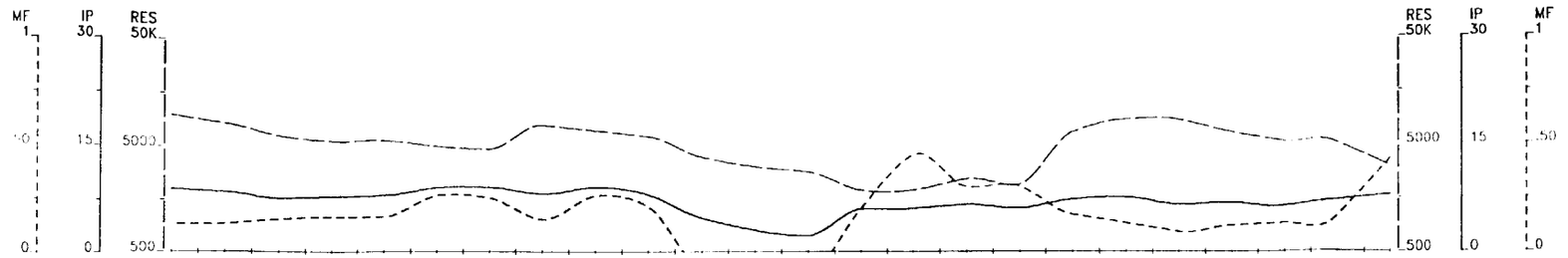
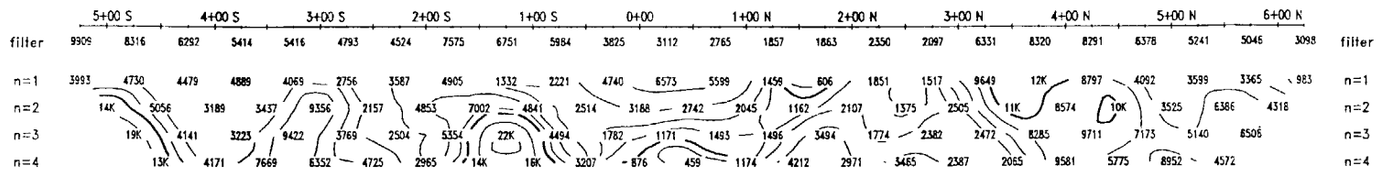
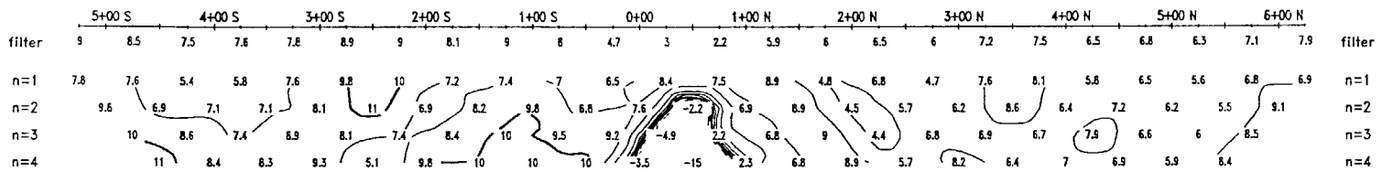


TOPOGRAPHY

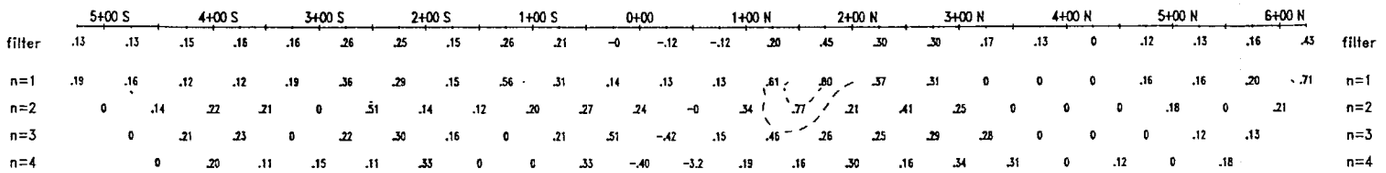


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

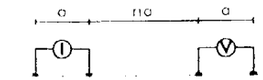
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1700 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

Software for the Earth Sciences

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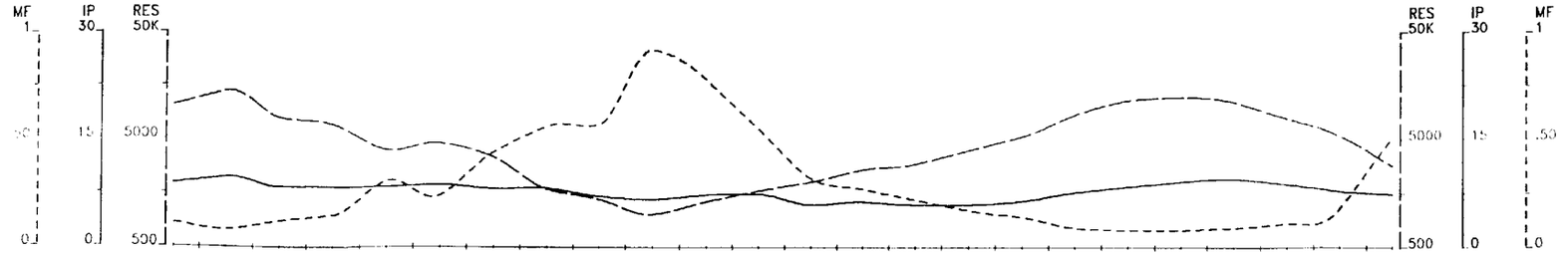
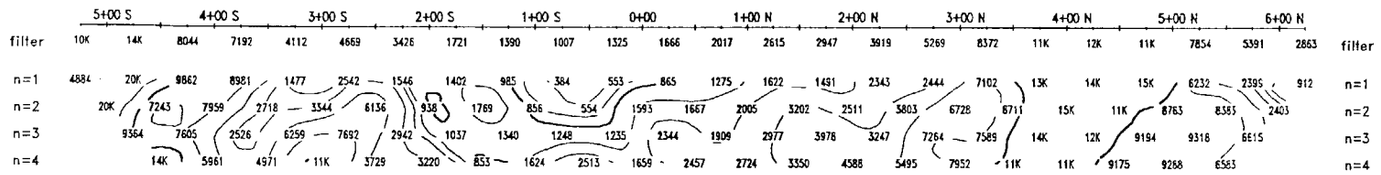
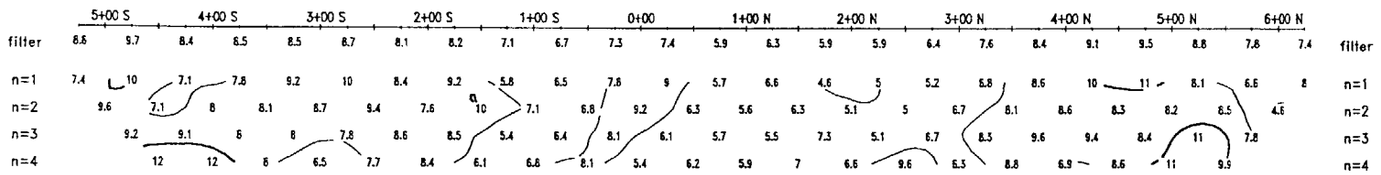


TOPOGRAPHY

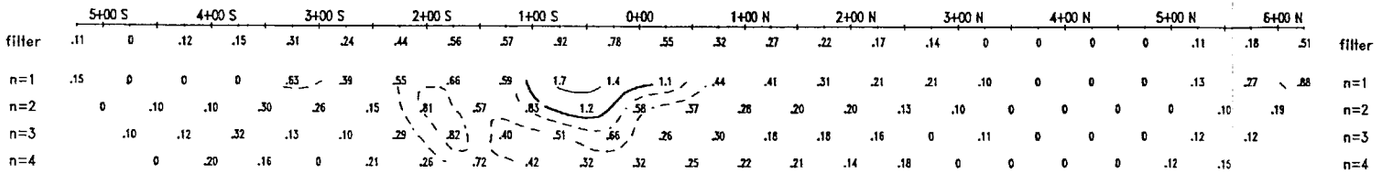


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

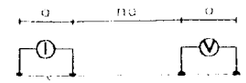
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1800 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4
plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

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Increase in polarization with little or no associated decrease in apparent resistivity.

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Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

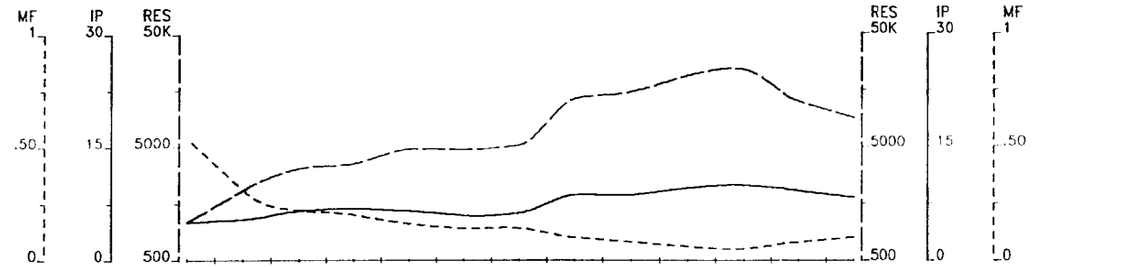
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

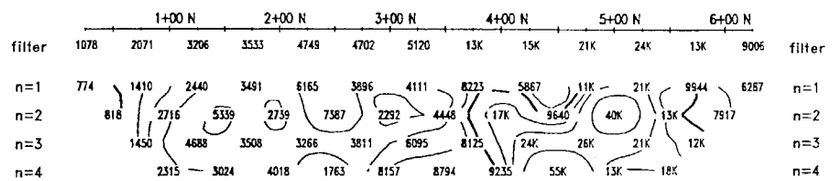
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

Software for the Earth Sciences

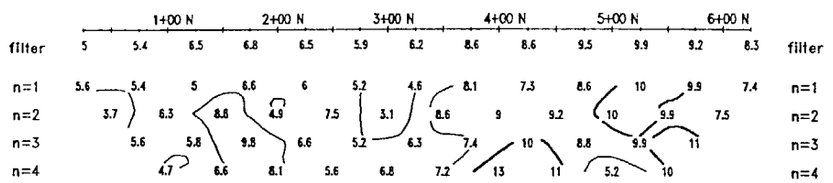
96-N028



TOPOGRAPHY

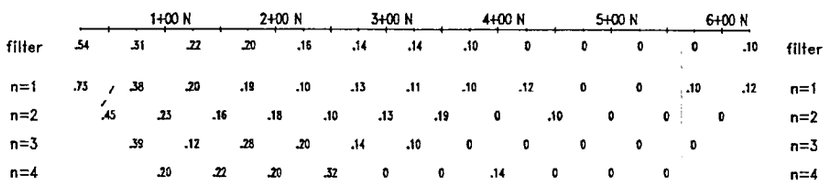


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

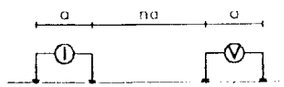
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1900 E

Dipole–Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

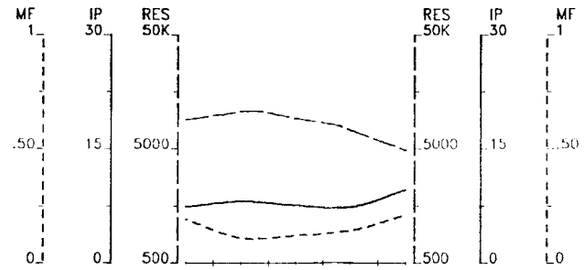
Induced Polarization Survey

THE OLIVER GROUP

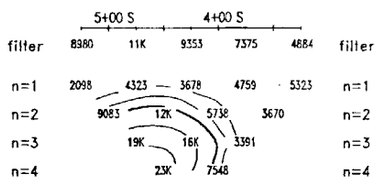
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

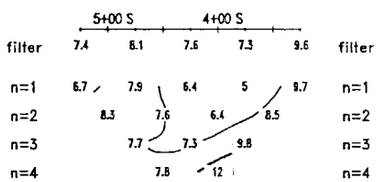
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



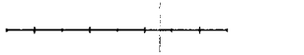
TOPOGRAPHY



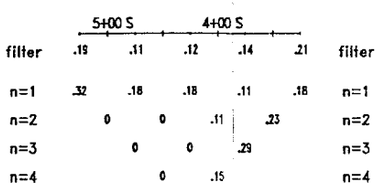
RESISTIVITY
(Ohm * m)



PHASE
(mrad)



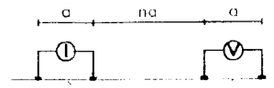
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1900 E

Dipole-Dipole Array



a = 50.0 M

n = 1, 2, 3, 4

plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

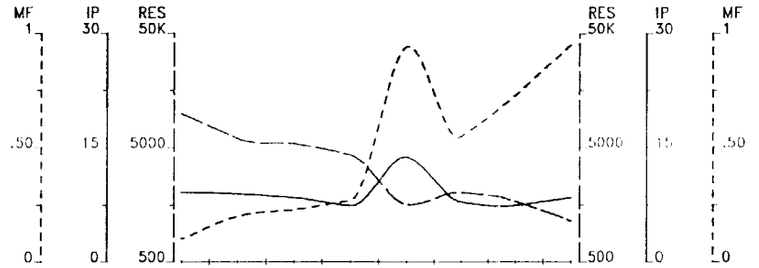
Induced Polarization Survey

THE OLIVER GROUP

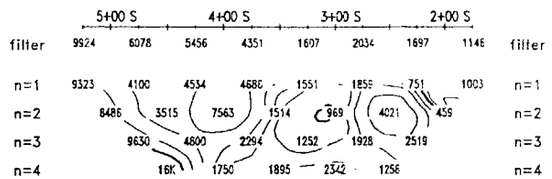
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

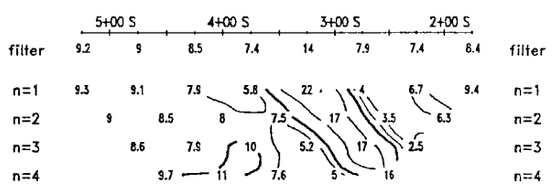
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

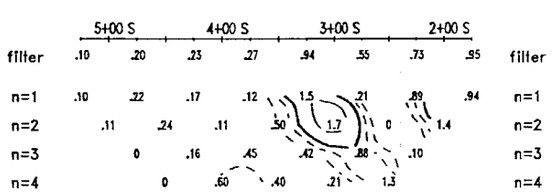


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

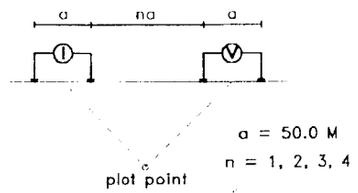
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 2000 E

Dipole-Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

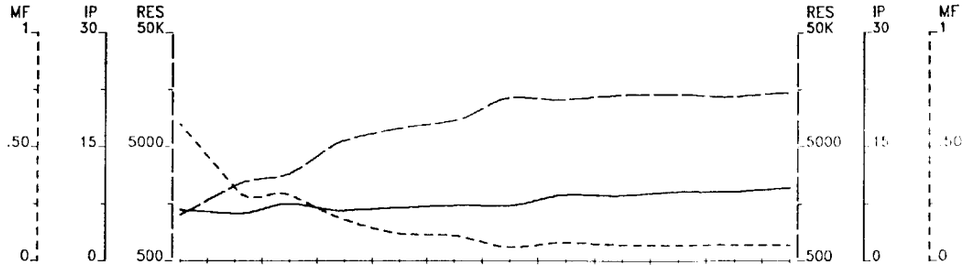
Induced Polarization Survey

THE OLIVER GROUP

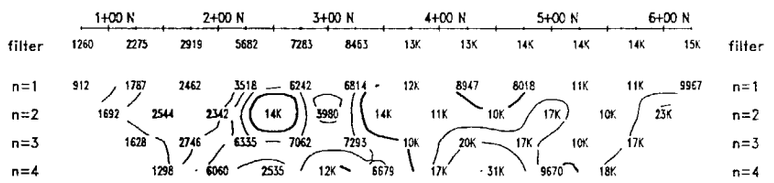
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

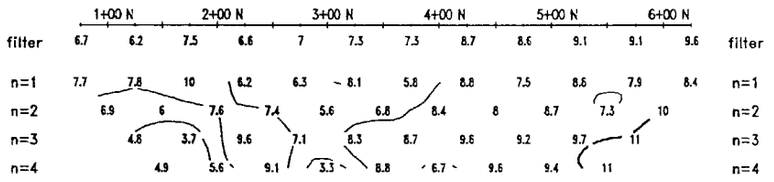
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

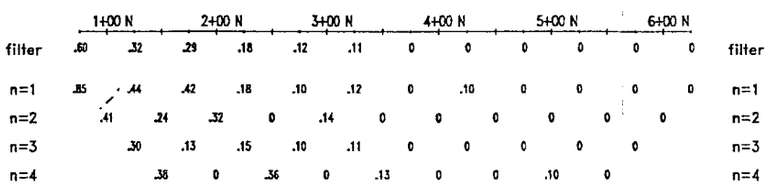


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

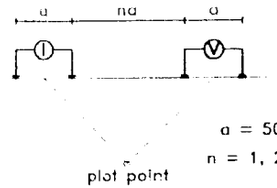
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 2000 E

Dipole–Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

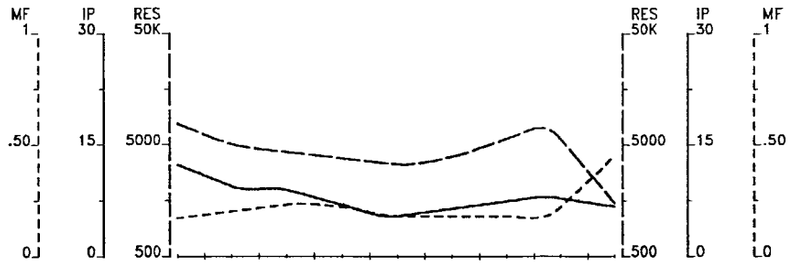
Induced Polarization Survey

THE OLIVER GROUP

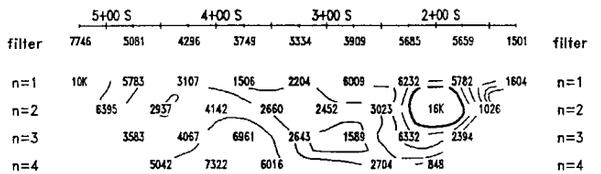
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

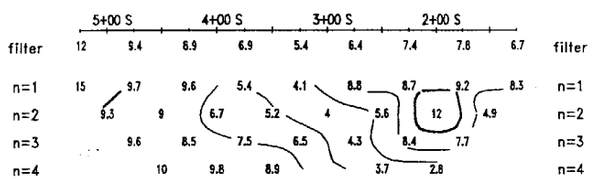
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

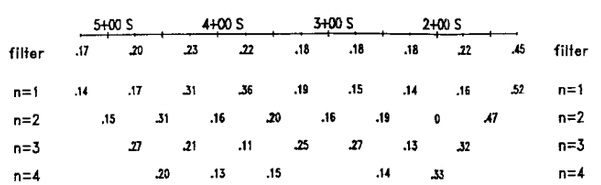


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

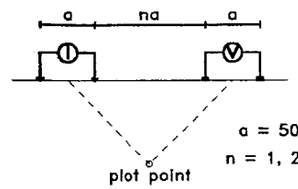
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 2100 E

Dipole–Dipole Array



Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

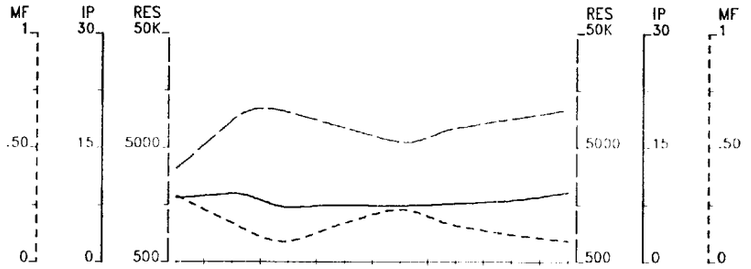
Induced Polarization Survey

THE OLIVER GROUP

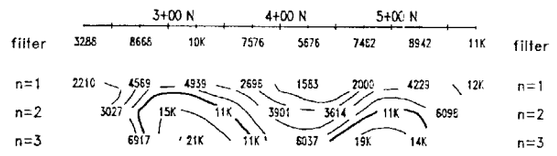
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

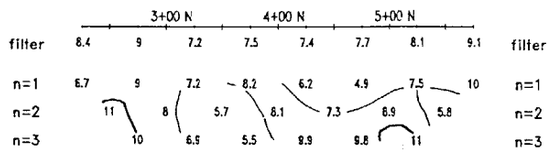
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

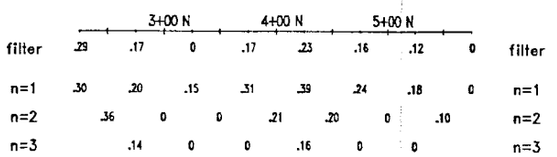


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

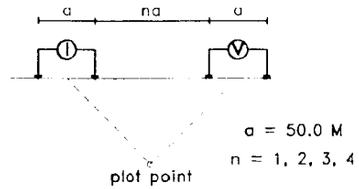
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 2100 E

Dipole–Dipole Array



Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

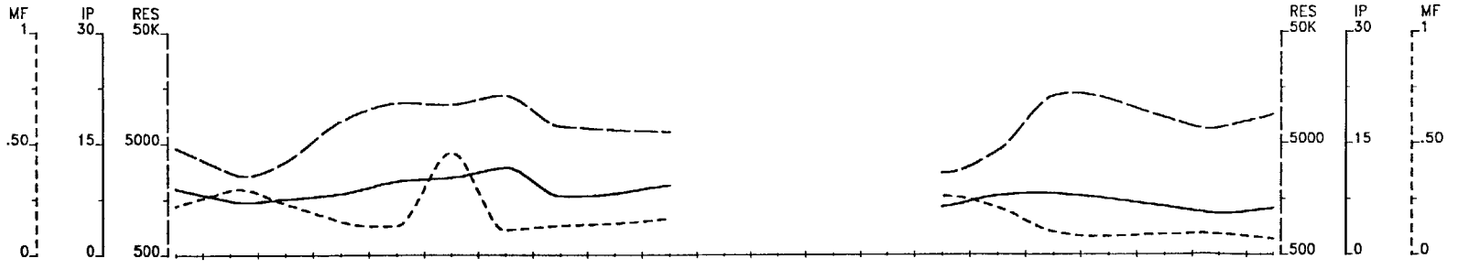
Induced Polarization Survey

THE OLIVER GROUP

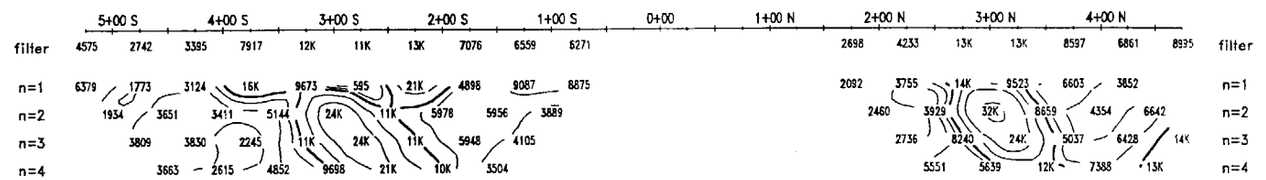
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

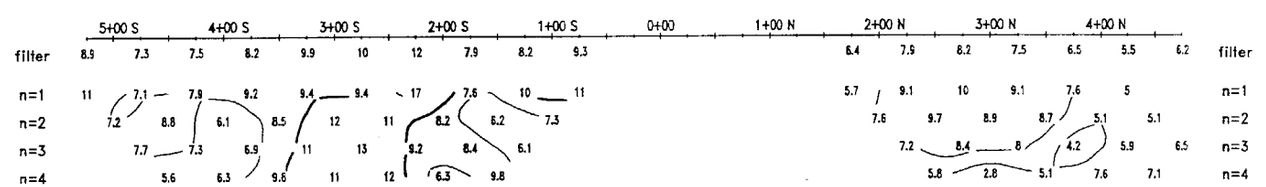
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

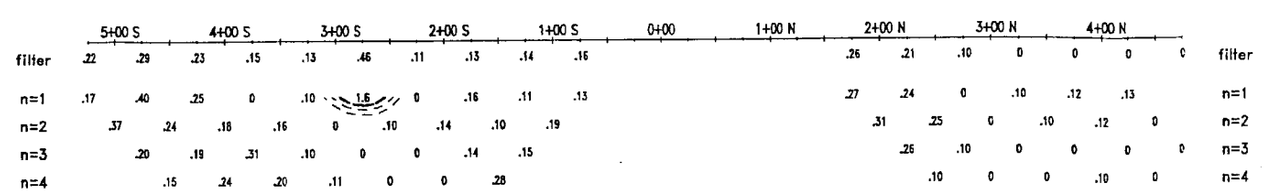


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

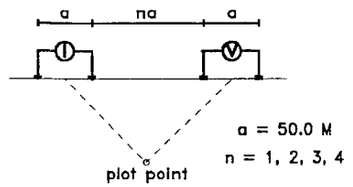
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 2200 E

Dipole–Dipole Array



Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

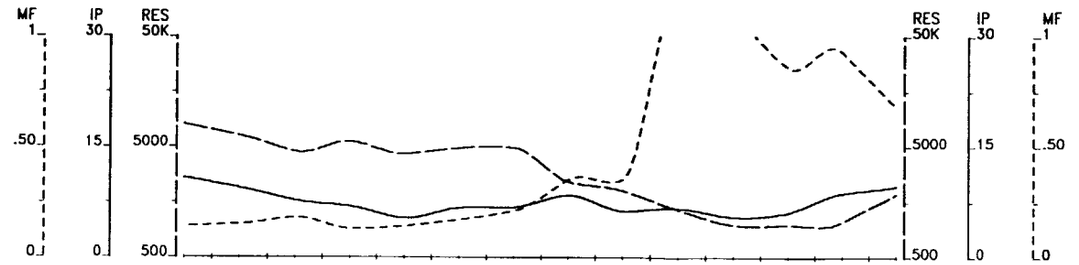
Induced Polarization Survey

THE OLIVER GROUP

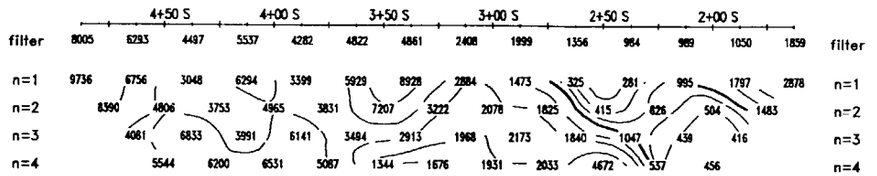
Showing South Block
Mc Neil Township

Date: 96/08/20
Interpretation by:
Scale 1 : 5000

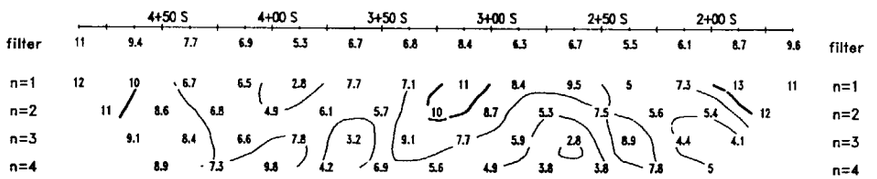
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

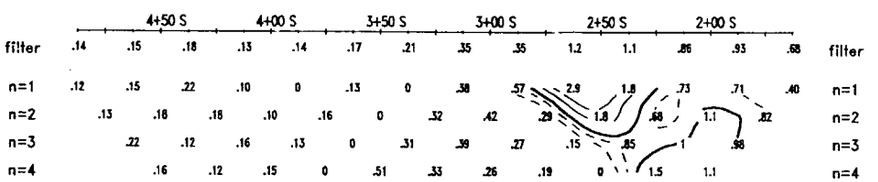


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

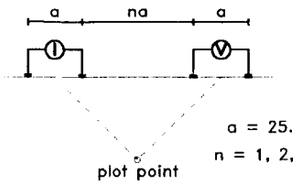
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 2000 E

Dipole–Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

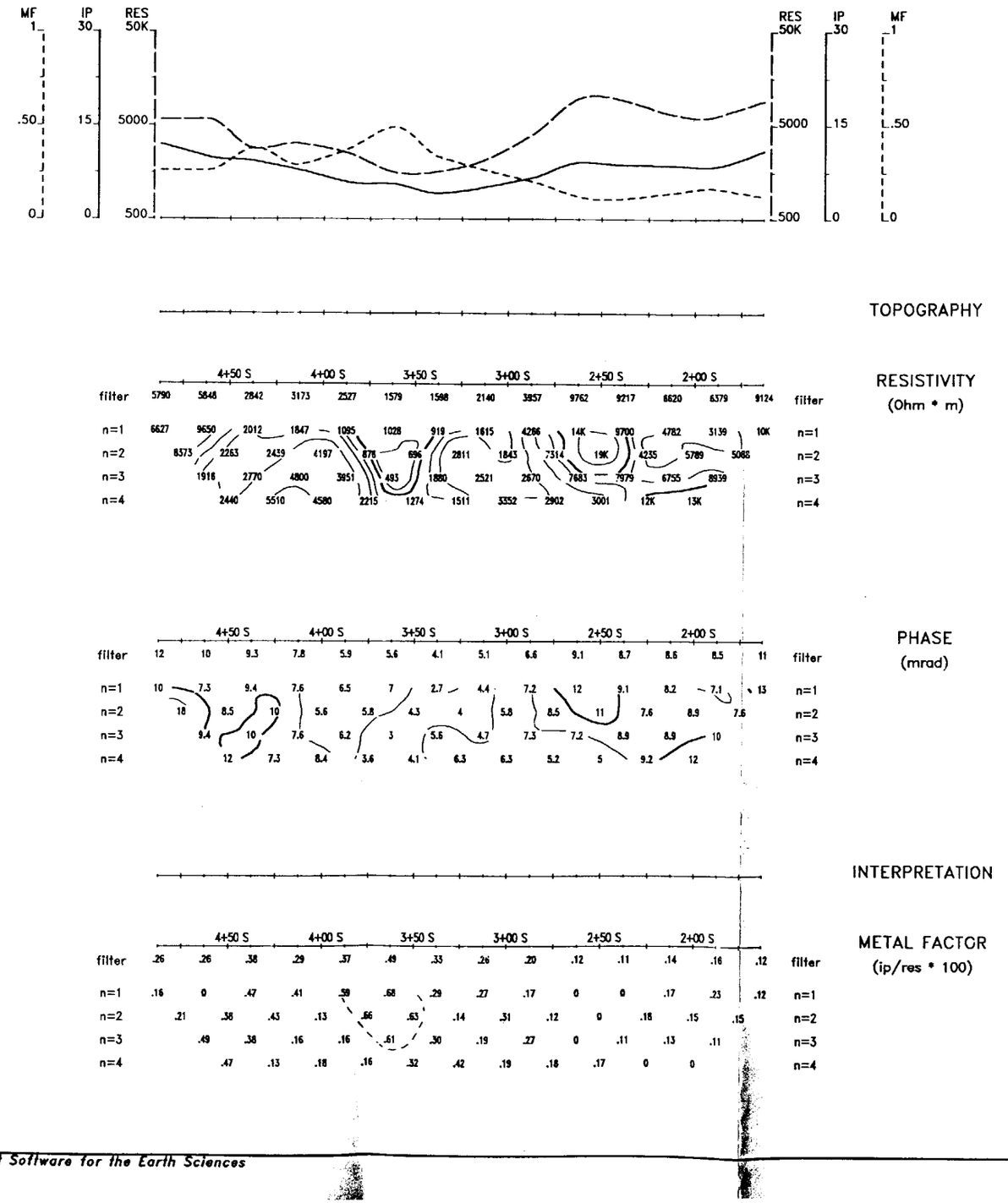
Showing South Block
Mc Neil Township

Date: 96/09/24
Interpretation by:
Scale 1 : 2500

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

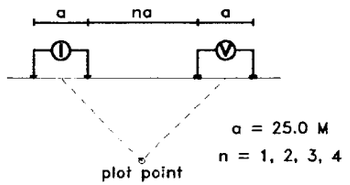
Geosoft Software for the Earth Sciences

96-N028



Line 2100 E

Dipole–Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

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Induced Polarization Survey

THE OLIVER GROUP

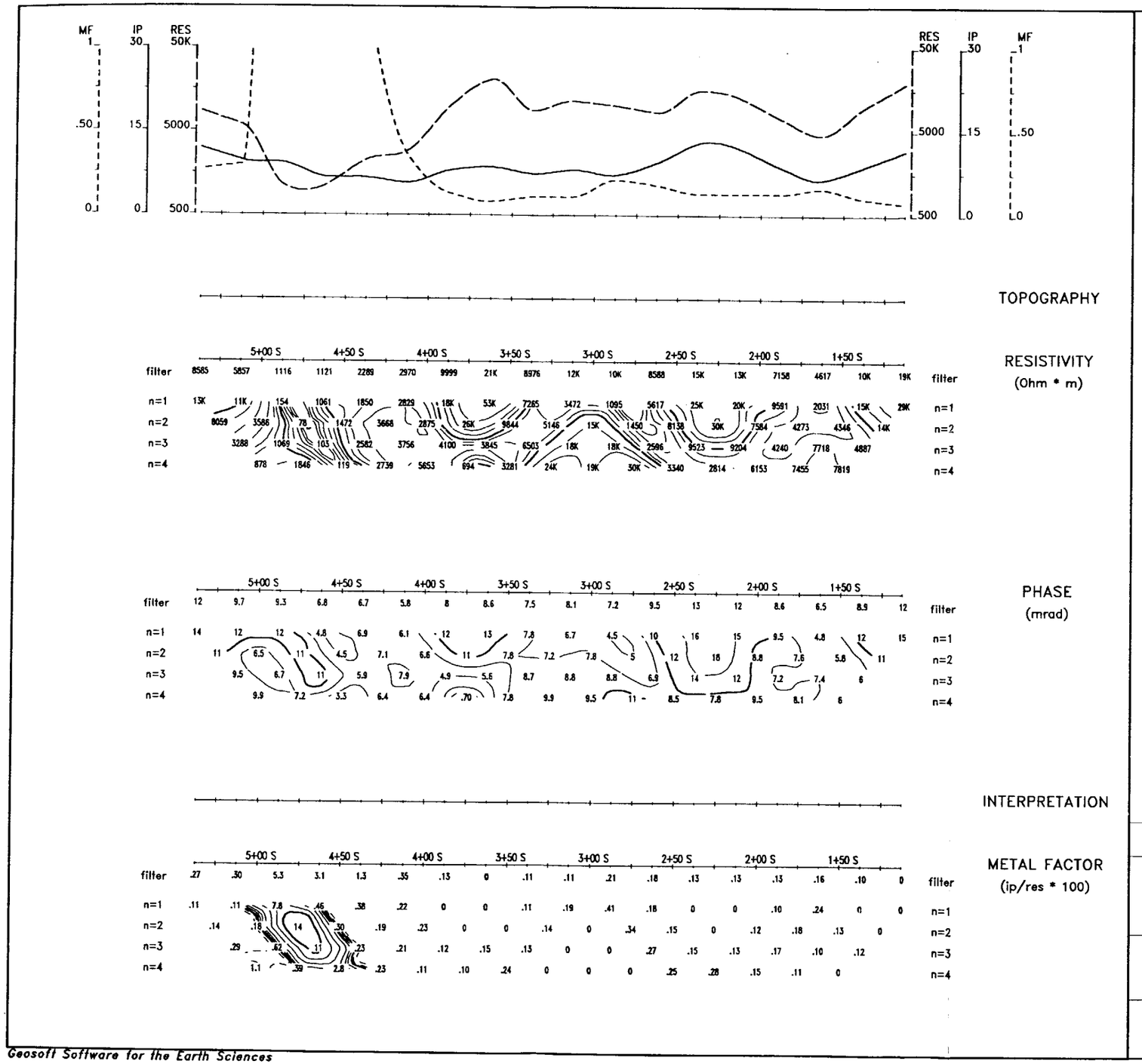
Showing South Block
Mc Neil Township

Date: 96/09/24
Interpretation by:
Scale 1 : 2500

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

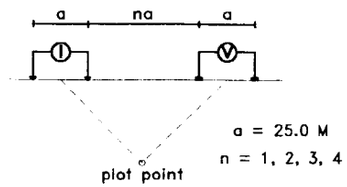
Geosoft Software for the Earth Sciences

96-N028



Line 2200 E

Dipole–Dipole Array



Filtered Profiles

		Filter
Resistivity	———	*
Polarization	———	* *
Metal Factor	- - - - - - -	* * *
		* * * *

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

- Increase in polarization associated to a relative decrease in apparent resistivity.
- Increase in polarization with little or no associated decrease in apparent resistivity.
- Weak or poorly defined polarization anomaly,no resistivity signature.
- Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

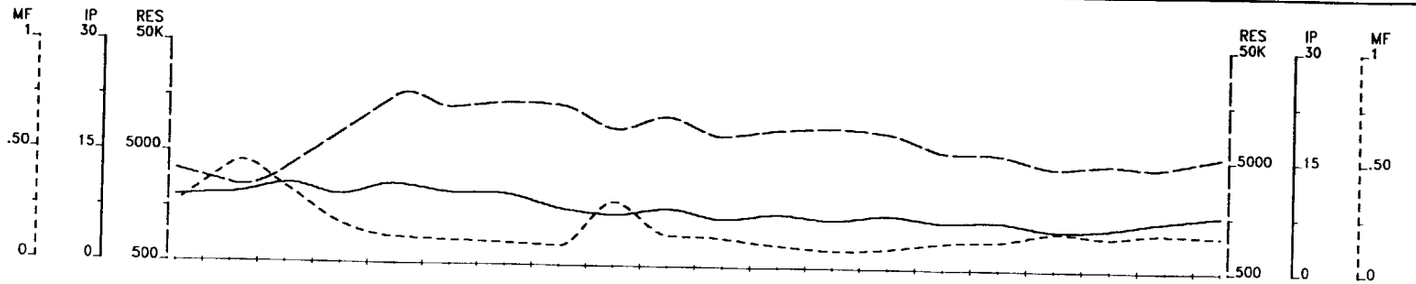
Showing South Block
Mc Neil Township

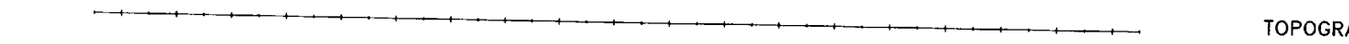
Date: 96/09/24
Interpretation by:
Scale 1 : 2500

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

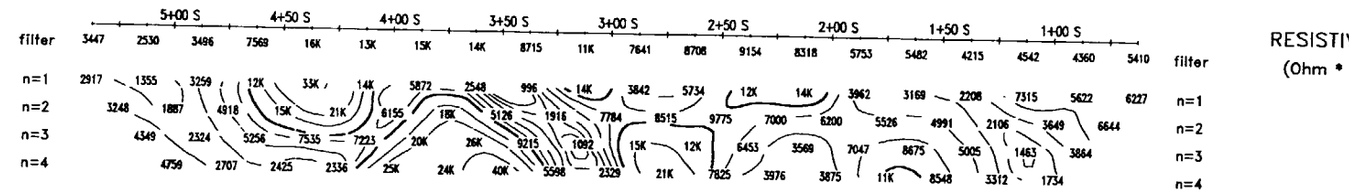
Geosoft Software for the Earth Sciences

96-N028

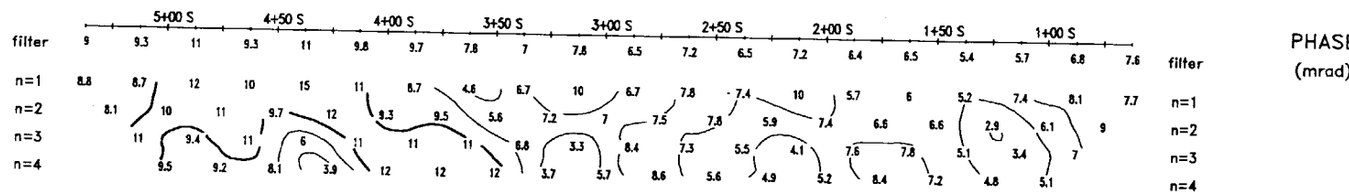




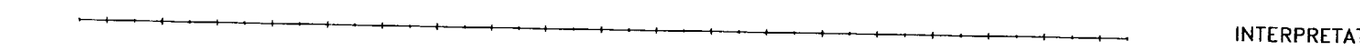
TOPOGRAPHY



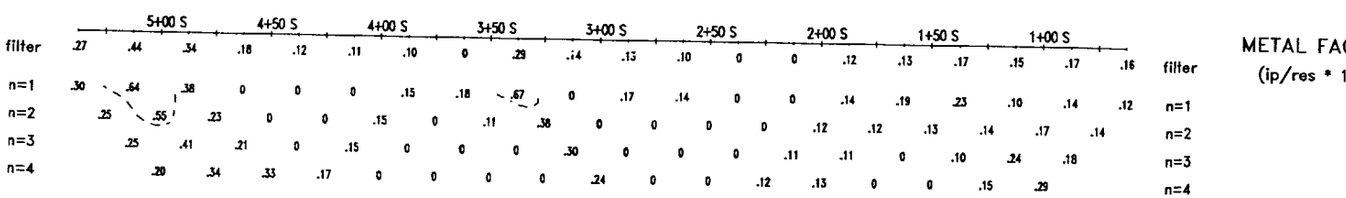
RESISTIVITY
(Ohm * m)



PHASE
(mrad)



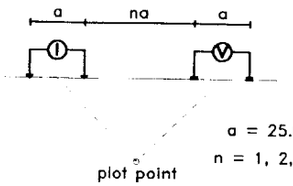
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 2300 E

Dipole–Dipole Array



Filtered Profiles

		Filter
Resistivity	————	* *
Polarization	————	* * *
Metal Factor	- - - - - - - -	* * * *

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

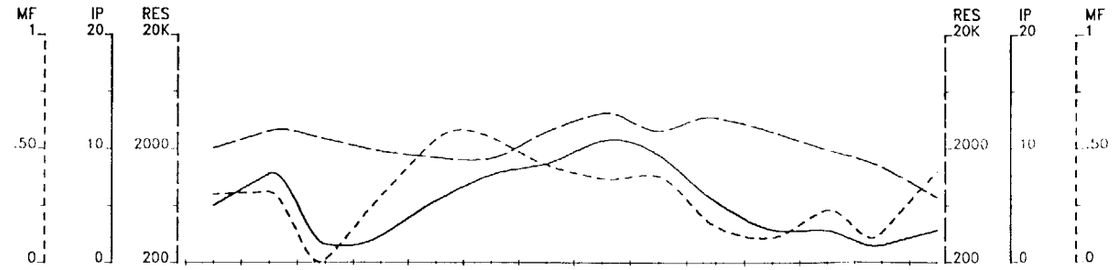
Showing South Block
Mc Neil Township

Date: 96/09/24
Interpretation by:
Scale 1 : 2500

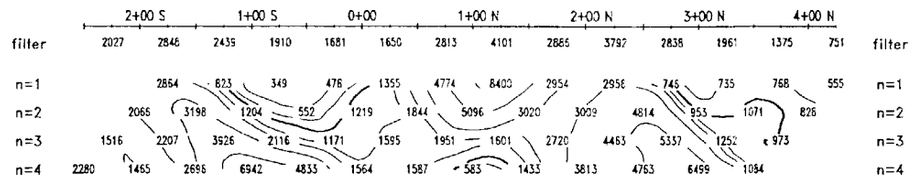
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

Geosoft Software for the Earth Sciences

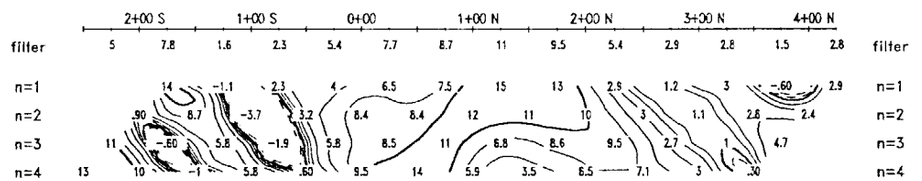
96-N028



TOPOGRAPHY

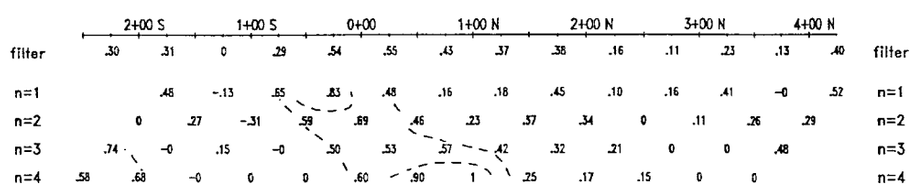


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

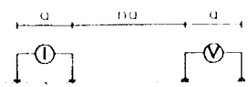
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 800 E

Dipole-Dipole Array



a = 50.0 M

n = 1, 2, 3, 4

plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

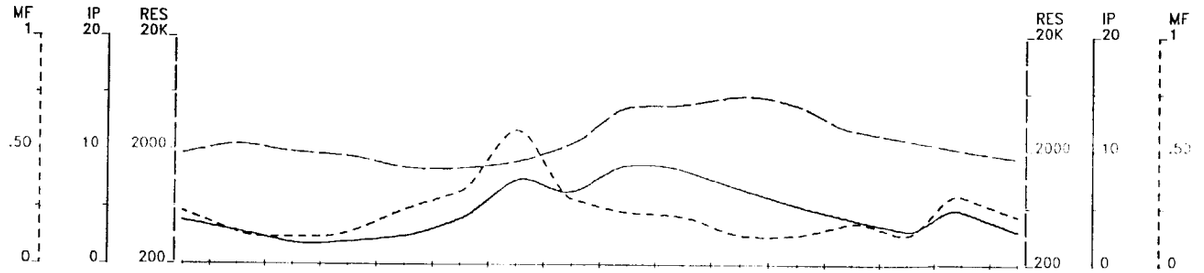
Induced Polarization Survey

THE OLIVER GROUP

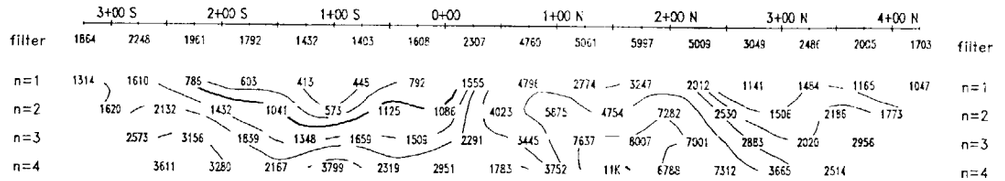
Showing North Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

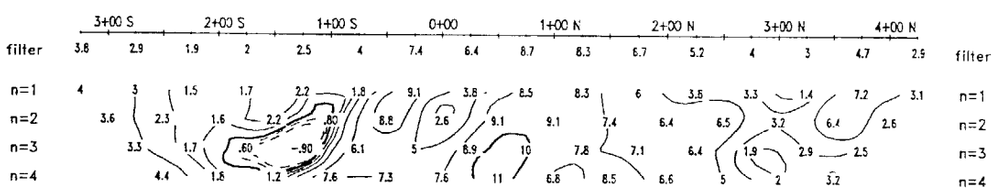
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

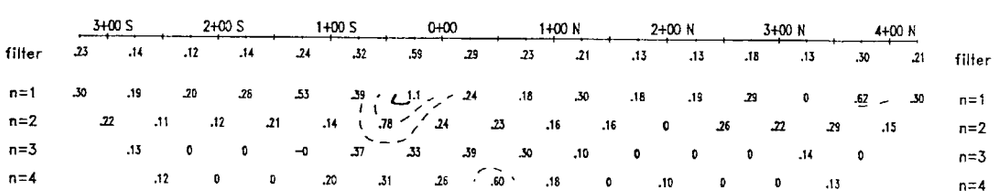


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

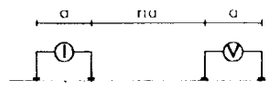
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 900 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

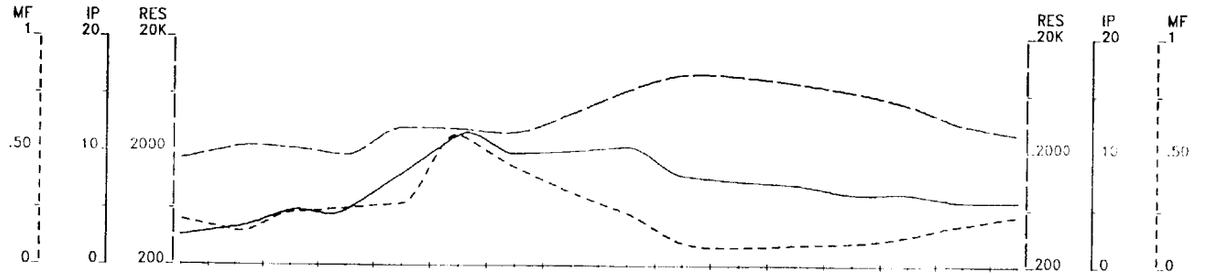
Induced Polarization Survey

THE OLIVER GROUP

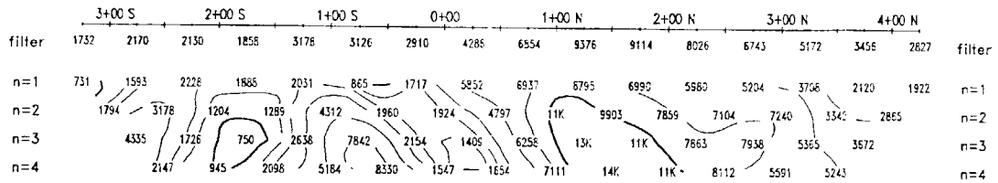
Showing North Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

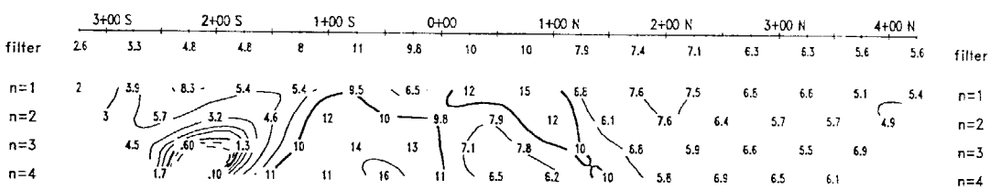
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

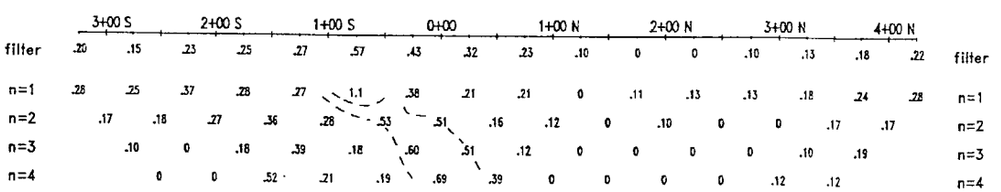


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

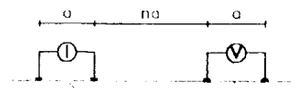
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1000 E

Dipole–Dipole Array



a = 50.0 M

n = 1, 2, 3, 4

plot point

Filtered Profiles

		Filter
Resistivity	———	*
Polarization	———	* *
Metal Factor	- - - - - - - -	* * *
		* * * *

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

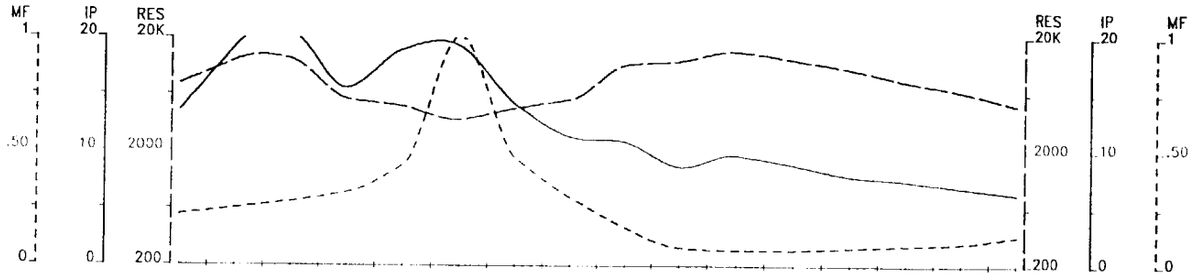
THE OLIVER GROUP

Showing North Block
Mc Neil Township

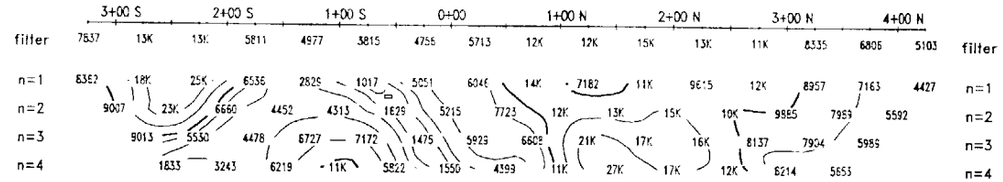
Date: 96/08/17
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

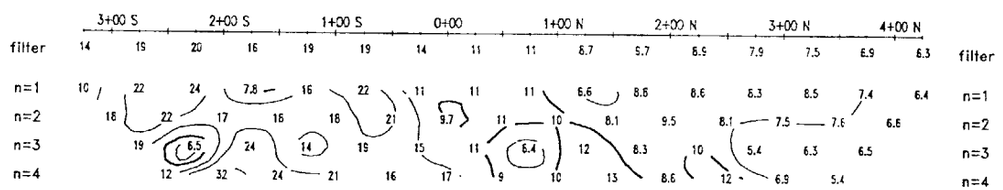
96-N02B



TOPOGRAPHY

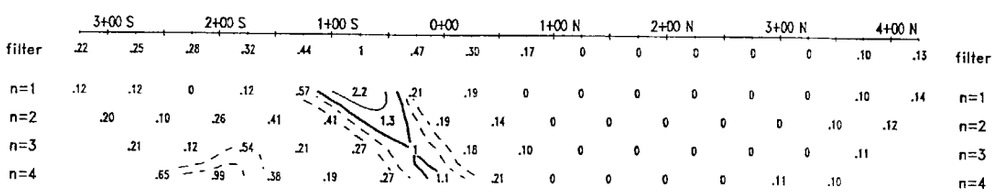


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

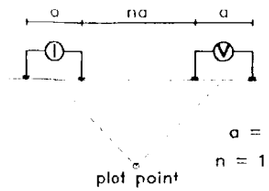
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1100 E

Dipole-Dipole Array



Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

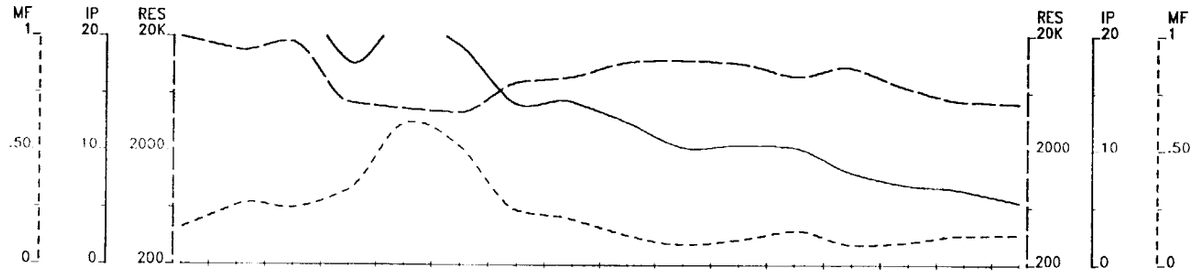
Induced Polarization Survey

THE OLIVER GROUP

Showing North Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



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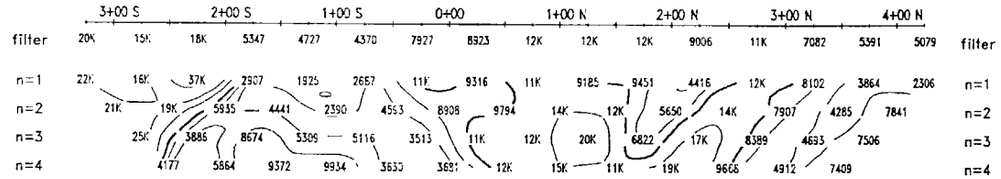
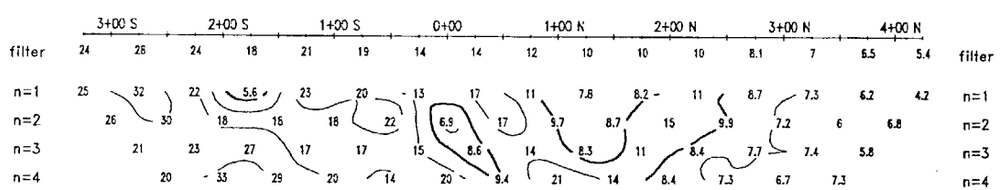
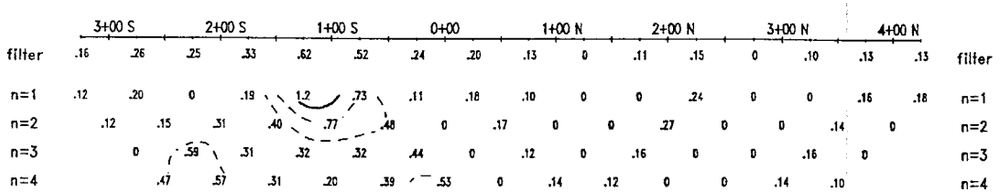


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

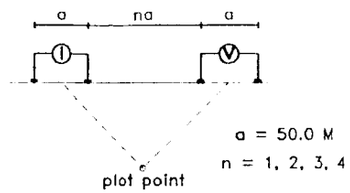
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1200 E

Dipole-Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

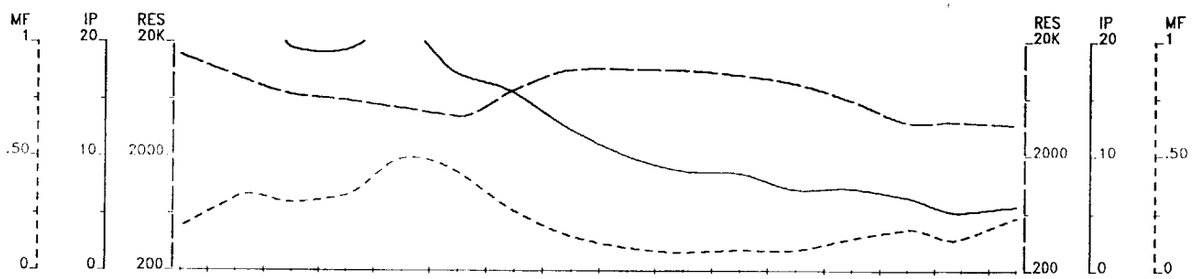
Induced Polarization Survey

THE OLIVER GROUP

Showing North Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



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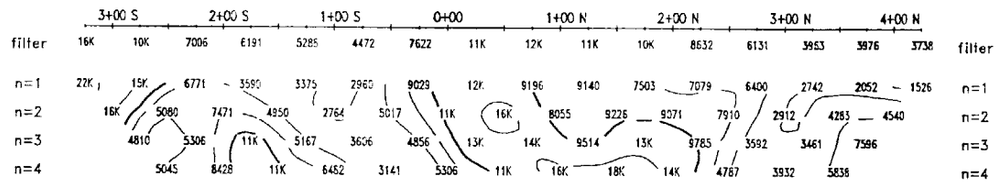
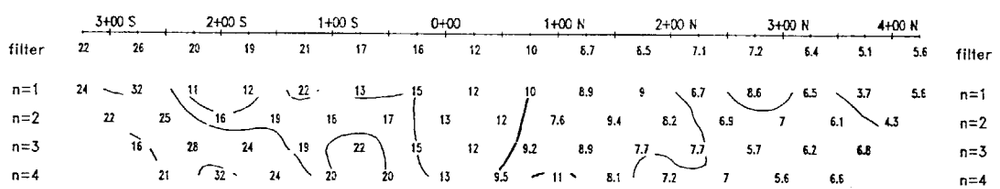
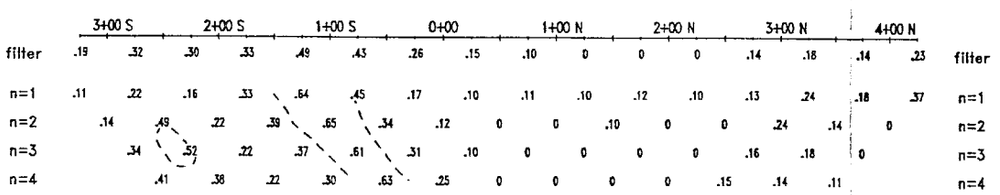


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

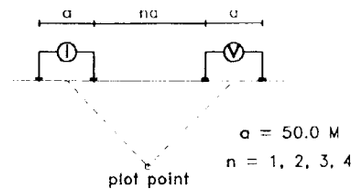
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1300 E

Dipole-Dipole Array



Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

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Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

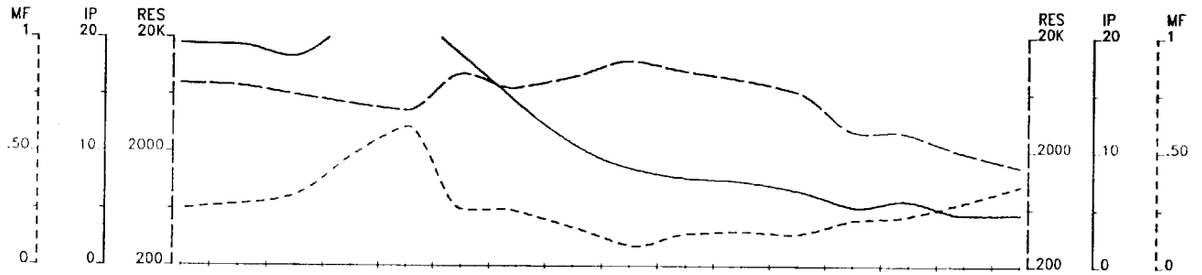
Induced Polarization Survey

THE OLIVER GROUP

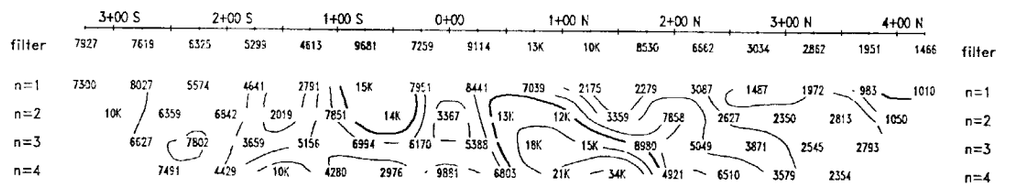
Showing North Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

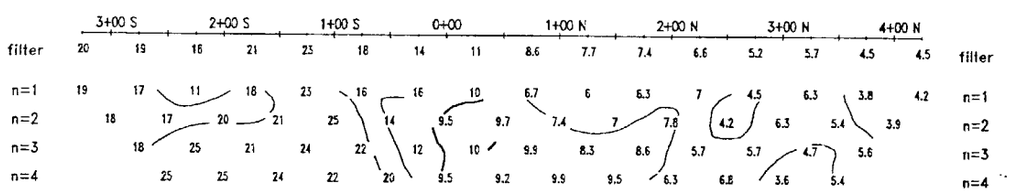
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

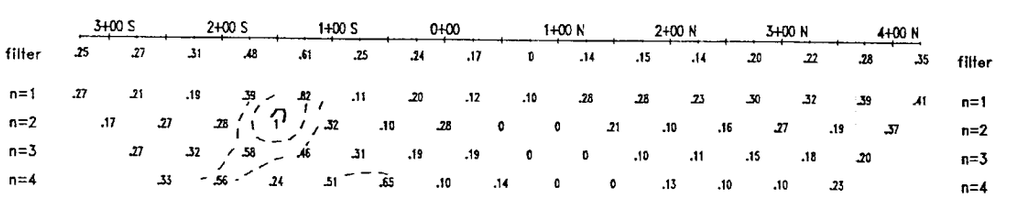


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

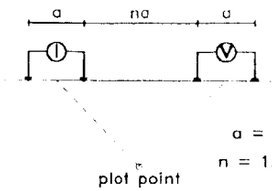
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1400 E

Dipole-Dipole Array



Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

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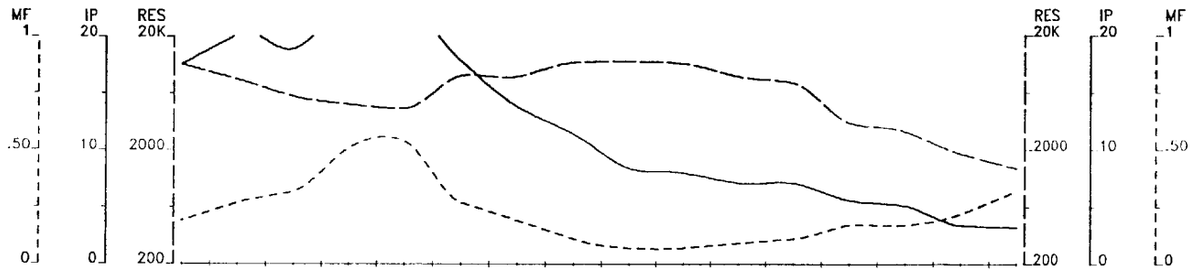
Induced Polarization Survey

THE OLIVER GROUP

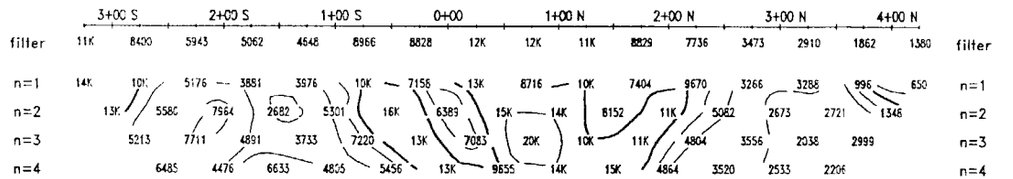
Showing North Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

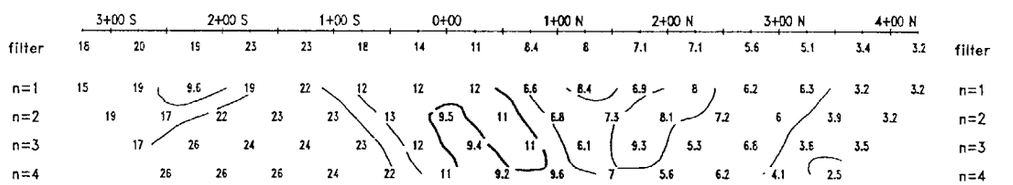
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

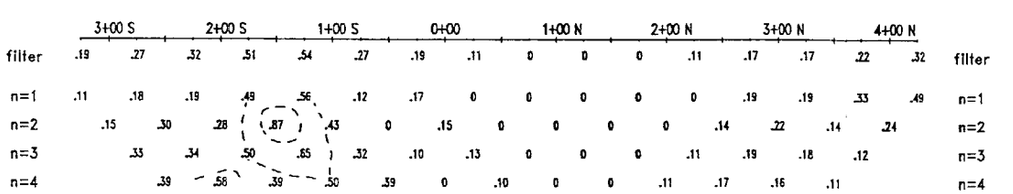


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

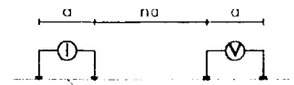
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1500 E

Dipole-Dipole Array



a = 50.0 M
n = 1, 2, 3, 4

plot point

Filtered Profiles

Filter

Resistivity
Polarization
Metal Factor

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

Increase in polarization associated to a relative decrease in apparent resistivity.

Increase in polarization with little or no associated decrease in apparent resistivity.

Weak or poorly defined polarization anomaly,no resistivity signature.

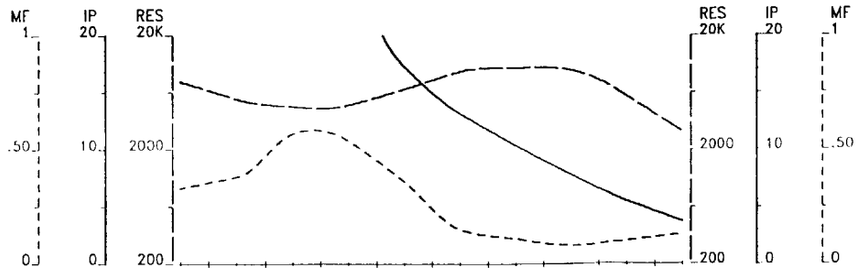
Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

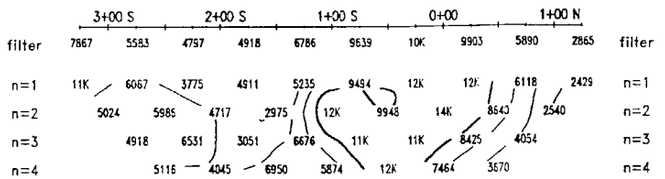
THE OLIVER GROUP
Showing North Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

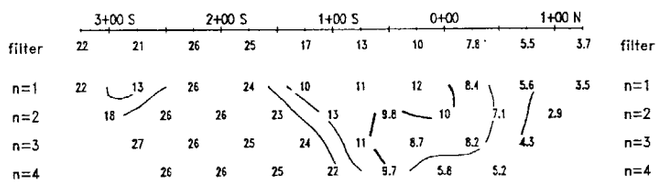
Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.



TOPOGRAPHY

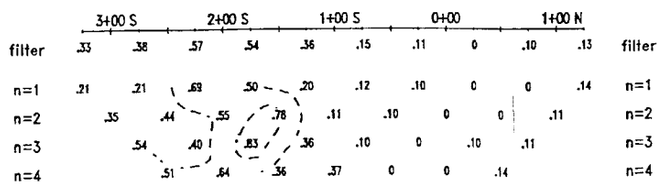


RESISTIVITY
(Ohm * m)



PHASE
(mrad)

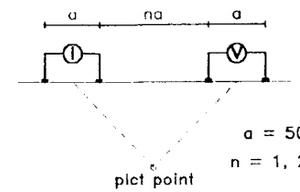
INTERPRETATION



METAL FACTOR
(ip/res * 100)

Line 1600 E

Dipole–Dipole Array



Filtered Profiles

Resistivity
Polarization
Metal Factor

Filter

Logarithmic Contours
1, 1.5, 2, 3, 5, 7.5, 10,..

Instruments: PHOENIX IPV4T, IPT1
Frequency: 1.0 Hz
Operator: John Marsh

INTERPRETATION

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Low resistivity feature.Bedrock valley or thick overburden.Structural causes?

Induced Polarization Survey

THE OLIVER GROUP

Showing North Block
Mc Neil Township

Date: 96/08/17
Interpretation by:
Scale 1 : 5000

Executed by: WALCER GEOPHYSICS LTD.
Compiled by: VAL D'OR SAGAX INC.

96-N028

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use)
W9780.00521
Assessment Files Research Imaging

Personal information coll
Mining Act, the informatic
Questions about this c
933 Ramsey Lake Road,

42A02NW0014 2 17340 MCNEIL

900

(3) of the Mining Act. Under section 8 of the
k and correspond with the mining land holder.
rthern Development and Mines, 6th Floor,

Instructions: - For work performed on Crown Lands before recording a claim, use form 0240.
- Please type or print in ink.

2.17340

1. Recorded holder(s) (Attach a list if necessary)

Name	Client Number
Address SEE ATTACHED LIST OF RECORDED HOLDERS	Telephone Number
	Fax Number
Name	Client Number
Address	Telephone Number
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

☐ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☒ Physical: drilling, stripping, trenching and associated assays ☐ Rehabilitation

		Office Use
Work Type DIAMOND DRILLING — COMPLETED OCTOBER 13-20, 1996		Commodity
		Total $ Value of Work Claimed $45,421
Dates Work Performed From See Above To (Day / Month / Year)		NTS Reference
Global Positioning System Data (If available)	Township/Area McNeil Township	Mining Division Larder Lake
	M or G-Plan Number M300	Resident Geologist District K. Lade

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name RALPH V. STEWART	Telephone Number 905-725-5725
Address 244 KEEWATIN ST. S., OSHAWA, ONT. L1H 6Z8	Fax Number 905-725-2798
Name	Telephone Number
Address	Fax Number
Name	Telephone Number
Address	Fax Number

RECEIVED
MAY 30 1997
MINING LANDS BRANCH

4. Certification by Recorded Holder or Agent

I, RALPH V. STEWART (Print Name), do hereby certify that I have personal knowledge of the facts set forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent Ralph V. Stewart			Date MAY 26, 1997
Agent's Address 244 KEEWATIN ST. S. OSHAWA, ONT. L1H 6Z8		Telephone Number 905-725-5725	Fax Number 905-725-2798

5. **Work to be recorded and distributed.** Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date.
eg	TB 7827	16 ha	$26, 825	N/A	$24,000	$2,825
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8, 892	$ 4,000	0	$4,892
1	1203943	4	3,466-	2,923	-	543-
2	1203944	10	8,666-	7,308	-	1,358-
3	1203945	3	2,600-	2,193	-	407-
4	✓1203946	9	7,799-	6,577	-	1,222-
5	1203947	7	6,066-	5,115	-	951-
6	✓1207672	4	3,466-	2,923	-	543-
7	1207683	2	1,733-	1,461	-	272-
8	1207684	6	5,199-	4,384	-	815-
9	✓1207685	8	6,934-	5,848	-	1,086-
10						
11						
12						
13			9 found 23 used	2.17340		
14						
15						
		Column Totals	45,929	38,732		7,197

I, Ralph V. Stewart (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing: Ralph V. Stewart (Agent) Date: MAY 26, 1997

6. **Instructions for cutting back credits that are not approved.**

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

RECEIVED
MAY 30 1997
MINING LANDS BRANCH

- ☑ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☑ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

① 1203943
② 1203947
③ 1207684
④ 1207685
⑤ 1203946
⑥ 1207683
⑦ 1203944
⑧ 1207672
⑨ 1203945

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp: RECEIVED KIRKLAND LAKE MINING DIVISION MAY 28 1997 11:44 AM

Deemed Approved Date: Aug 26/97 Date Notification Sent:

Date Approved: Total Value of Credit Approved:

Approved for Recording by Mining Recorder (Signature): acting

Ontario Ministry of Northern Development and Mines

Statement of Costs for Assessment Credit

Transaction Number (office use)
W9780.00521

Personal information collected on this form is obtained under the authority of subsection 6(1) of the Assessment Work Regulation 6/96. Under section 8 of the Mining Act, the information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questions about this collection should be directed to the Chief Mining Recorder, Ministry of Northern Development and Mines, 6th Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Work Type	Units of Work Depending on the type of work, list the number of hours/days worked, metres of drilling, kilometres of grid line, number of samples, etc.	Cost Per Unit of work	Total Cost $
LINE CUTTING	46.5	$ 322.58/KM	15,000
I.P. GEOPHYSICAL SURVEY	41.6	$ 895.00/KM	37,236
DIAMOND DRILLING	1200'	$ 26.98/FT*	32,373
PROFESSIONAL FEES (Geologist)	29.6	$ 325/DAY	9,620
ROD WOOLHAM (CONSULTANT)	21.7	$ 65/HOUR	1,411
GEOLOGICAL ASSISTANTS (2)	31.0	$ 150/DAY	4,650
ASSAY ANALYSIS	64	$ 24.92 * ALL INCLUSIVE RATE	1,595
Associated Costs (e.g. supplies, mobilization and demobilization).			
EXPLORATION SUPPLIES			2,250
Transportation Costs AIR FARES (3.4)		$ 542.00	1,813
COMPANY OWNED VEHICLE (5400 KM)		$ .30	1,659
TRUCK + ATV RENTAL (16.6 DAYS)		$ 88.55	1,470
Food and Lodging Costs			
47 MAN-DAYS		$ 87.66	4,120
		Total Value of Assessment Work	$ 113,197

RECEIVED
MAY 30 1997
MINING LANDS BRANCH

Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
2. If work is filed after two years and up to five years after performance, it can only be claimed at 50% of the Total Value of Assessment Work. If this situation applies to your claims, use the calculation below:

TOTAL VALUE OF ASSESSMENT WORK × 0.50 = Total $ value of worked claimed.

Note:
- Work older than 5 years is not eligible for credit.
- A recorded holder may be required to verify expenditures claimed in this statement of costs within 45 days of a request for verification and/or correction/clarification. If verification and/or correction/clarification is not made, the Minister may reject all or part of the assessment work submitted.

Certification verifying costs:

I, RALPH V. STEWART (please print full name), do hereby certify, that the amounts shown are as accurate as may reasonably be determined and the costs were incurred while conducting assessment work on the lands indicated on the accompanying Declaration of Work form as AGENT (recorded holder, agent, or state company position with signing authority) I am authorized to make this certification.

Signature: Ralph V. Stewart Date: MAY 26, 1997

0212 (02/96)

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use): W9780.00522
Assessment Files Research Imaging

Personal information collected on this form is obtained under the authority of subsections 65(2) and 66(3) of the Mining Act. Under section 8 of the Mining Act, the information is a public record. This information will be used to review the assessment work and correspond with the mining land holder. Questions about this collection should be directed to the Chief Mining Recorder, Ministry of Northern Development and Mines, 6th Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Instructions: - For work performed on Crown Lands before recording a claim, use form 0240.
- Please type or print in ink.

1. Recorded holder(s) (Attach a list if necessary) 2.17340

Name	Client Number
Address: See Attached List Of Recorded Holders	Telephone Number
	Fax Number
Name	Client Number
Address	Telephone Number
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

☒ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☐ Physical: drilling, stripping, trenching and associated assays ☐ Rehabilitation

Work Type	Office Use
Line Cutting – July 1 to 31, 1996 I.P. Geophysical Survey – August 6–31, 1996 AND September 16–19, 1996	Commodity
	Total $ Value of Work Claimed 67,268
Dates Work Performed From: See Above To: Day / Month / Year	NTS Reference
Global Positioning System Data (if available) — Township/Area: McNeil Township	Mining Division: Larder Lake
M or G-Plan Number: M300	Resident Geologist District: K. Lake

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name / Address	Telephone Number / Fax Number
Name: Ralph V. Stewart Address: 244 Keewatin St. S., Oshawa, Ont. L1H 6Z8	Telephone Number: 905-725-5725 Fax Number: 905-725-2798
Name: Rod W. Woolham Address: 1463 Fieldlight Boul; Pickering, Ont. L1V 2S3	Telephone Number: 905-831-8146 Fax Number: 905-831-3840
Name: Val D'Or Sagax Inc. Address: 50 Lamaque Boul; Val D'Or, P.Q. J9P 2H6	Telephone Number: 819-874-2001 Fax Number: 819-874-2002

RECEIVED
MAY 30 1997
MINE LANDS BRANCH

4. Certification by Recorded Holder or Agent

I, Ralph V. Stewart (Print Name), do hereby certify that I have personal knowledge of the facts set forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent	Date
Ralph V. Stewart	May 26, 1997
Agent's Address: 244 Keewatin St. S. Oshawa, Ont. L1H 6Z8 — Telephone Number: 905-725-5725	Fax Number: 905-725-2798

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the mining land where work was performed, at the time work was performed. A map showing the contiguous link must accompany this form.

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date.
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eg	1234568	2	$ 8, 892	$ 4,000	0	$4,892
1	✓1203943	4	5,077	5,077		
2	✓1203944	10	12,692	12,692		
3	1203945	3	3,808	3,808		
4	✓1203946	9	11,423	11,423		
5	✓1203947	7	8,884	8,884		
6	✓1207672	4	5,077	5,077		
7	✓1207683	2	2,538	2,538		
8	✓1207684	6	7,615	7,615		
9	✓1207685	8	10,154	10,154		
10						
11						
12						
13						
14						
15						
		Column Totals	67,268	67,268		

Applied Banked

I, RALPH V. STEWART (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing: Ralph V. Stewart (AGENT) Date: MAY 26, 1997

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RECEIVED
MAY 30 1997
MINING LANDS BRANCH

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⑦ 1203944
⑧ 1207672
⑨ 1203945

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp	Deemed Approved Date: Aug 26/97 DM	Date Notification Sent
	Date Approved	Total Value of Credit Approved
	Approved for Recording by Mining Recorder (Signature): acting	

Ontario Ministry of Northern Development and Mines

Statement of Costs for Assessment Credit

Transaction Number (office use): W9780.005.

Personal information collected on this form is obtained under the authority of subsection 6(1) of the Assessment Work Regulation 6/96. Under section 8 of the Mining Act, the information is a public record. This information will be used to review the assessment work and correspond w the mining land holder. Questions about this collection should be directed to the Chief Mining Recorder, Ministry of Northern Development an Mines, 6th Floor, 933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

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ASSAY ANALYSIS	64	$24.92	1,595
Associated Costs (e.g. supplies, mobilization and demobilization).		* ALL INCLUSIVE RATE	
EXPLORATION SUPPLIES			2,250
Transportation Costs AIR FARES (3.4)		$542.00	1,813
COMPANY OWNED VEHICLE (5400 KM)		$ .30	1,659
TRUCK + ATV. RENTAL (16.6 DAYS)		$ 88.55	1,470
Food and Lodging Costs			
47 MAN DAYS		$ 87.66	4,120
		Total Value of Assessment Work	$ 113,197

Calculations of Filing Discounts:

1. Work filed within two years of performance is claimed at 100% of the above Total Value of Assessment Work.
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RECEIVED
MAY 30 1997
MINING LANDS BRANCH

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Signature: Ralph V. Stewart Date: MAY 26, 1997

0212 (02/96)

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (888) 415-9846
Fax: (705) 670-5863

August 20, 1997

JOHN HERBERT OLIVER
RR2 S34 COMP. C1
4222 6TH AVENUE
PEACHLAND, B.C.
V0H-1X0

Dear Sir or Madam:

Submission Number: 2.17340

Subject: Transaction Number(s):		**Status**
	W9780.00522	Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact Lucille Jerome by e-mail at jerome_l@torv05.ndm.gov.on.ca or by telephone at (705) 670-5858.

Yours sincerely,

ORIGINAL SIGNED BY
Blair Kite
Supervisor, Geoscience Assessment Office
Mining Lands Section

Correspondence ID: 11232
Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.17340

Date Correspondence Sent: August 20, 1997 **Assessor:** Lucille Jerome

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9780.00522	1203943	MCNEIL	Approval	August 20, 1997

Section:
14 Geophysical IP

Assessment work credit has been redistributed, as outlined on the attached Distribution of Assessment Work Credit sheet, to better reflect the location of the work.

Correspondence to:

Resident Geologist
Kirkland Lake, ON

Assessment Files Library
Sudbury, ON

Recorded Holder(s) and/or Agent(s):

Ralph V. Stewart
OSHAWA, ON, CANADA

JOHN HERBERT OLIVER
PEACHLAND, B.C.

GAIL SULLIVAN OLIVER
LONDON, Ontario

Distribution of Assessment Work Credit

The following credit distribution reflects the value of assessment work performed on the mining land(s).

Date: August 20, 1997

Submission Number: 2.17340

Transaction Number: W9780.00522

Claim Number	Value Of Work Performed
1203943	7,700.00
1203945	5,768.00
1203946	17,300.00
1203947	13,500.00
1207672	7,700.00
1207685	15,300.00
Total: $	67,268.00

Correspondence ID: 11232

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (888) 415-9846
Fax: (705) 670-5863

September 23, 1997

JOHN HERBERT OLIVER
RR2 S34 COMP. C1
4222 6TH AVENUE
PEACHLAND, B.C.
V0H-1X0

Dear Sir or Madam:

Submission Number: 2.17340

Subject: Transaction Number(s):		**Status**
	W9780.00521	Approval After Notice

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact Lucille Jerome by e-mail at jerome_l@torv05.ndm.gov.on.ca or by telephone at (705) 670-5858.

Yours sincerely,

ORIGINAL SIGNED BY
Blair Kite
Supervisor, Geoscience Assessment Office
Mining Lands Section

Correspondence ID: 11348
Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.17340

Date Correspondence Sent: September 23, 1997 **Assessor:** Lucille Jerome

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9780.00521	1203946	MCNEIL	Approval After Notice	September 23, 1997

Section:
16 Drilling PDRILL

The requested revisions for this submission, as outlined in the 45 Day Notification dated August 20, 1997, have been received within the time period specified.

Assessment work credit for this submission has been approved at $44,421.00.

Correspondence to:

Resident Geologist
Kirkland Lake, ON

Assessment Files Library
Sudbury, ON

Recorded Holder(s) and/or Agent(s):

Ralph V. Stewart
OSHAWA, ON, CANADA

JOHN HERBERT OLIVER
PEACHLAND, B.C.

GAIL SULLIVAN OLIVER
LONDON, Ontario

Correspondence ID: 11348

Distribution of Assessment Work Credit

The following credit distribution reflects the value of assessment work performed on the mining land(s).

Date: September 23, 1997

Submission Number: 2.17340

Transaction Number: W9780.00521

Claim Number	Value Of Work Performed
1203946	14,807.00
1207672	14,807.00
1207685	14,807.00
Total: $	44,421.00

Correspondence ID: 11348

1. Recorded Holders---Claim Numbers: 1203943 to -947 Incl.
(9 claim blocks) 1207683 to -685 Incl.
1207672.
(McNeil Township)

Name: John H. Oliver
4222 6th. Ave, Peachland
B.C., V0H 1X0

Client No. 177706
Tel. No. 250-767-3494
Fax. No. 250-767-3231

Name: Winnifred Ethel Oliver
200 Gladman Ave.
London, Ontario
N6J 1X5

Client No. 302633
Tel. No. 519-679-8094
Fax. Np. 519-679-8094

Name: Gail Sullivan Oliver
200 Gladman Ave
London, Ontario
N6J 1X5

Client No. 177698
Tel. No. 519-679-8094
Fax. No. 519-679-8094

2.17340

W9780.0052

2.17340

1. Recorded Holders---Claim Numbers: 1203943 to -947 Incl.
(9 claim blocks) 1207683 to -685 Incl.
1207672.
(McNeil Township)

Name: John H. Oliver
4222 6th. Ave, Peachland
B.C., V0H 1X0

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Name: Gail Sullivan Oliver
200 Gladman Ave
London, Ontario
N6J 1X5

Client No. 177698
Tel. No. 519-679-8094
Fax. No. 519-679-8094

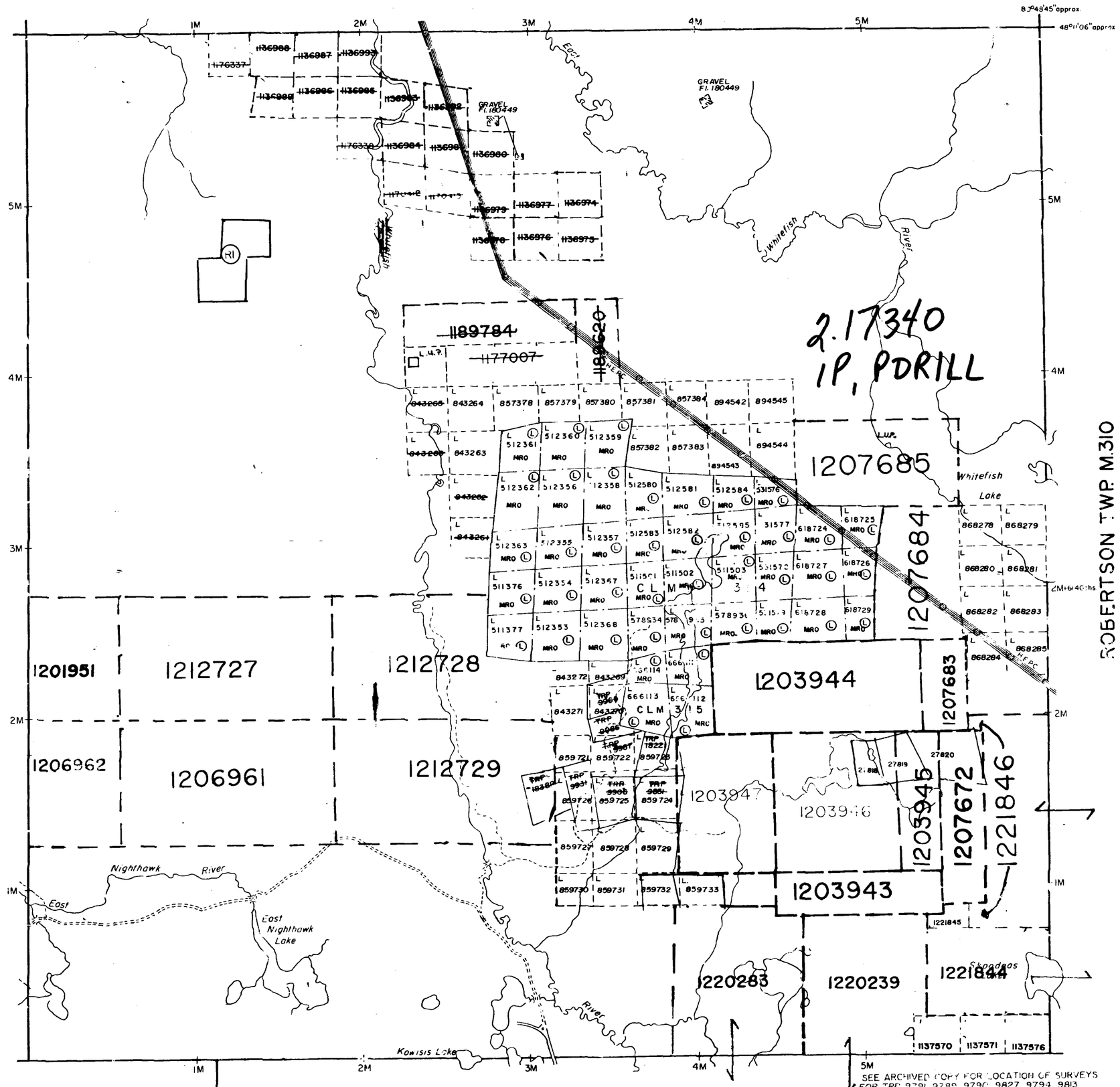
FASKEN TWP. M.280

CLEAVER TWP. M.269

ROBERTSON TWP. M.310

HINCKS TWP. M.223

ARGYLE TWP. M.203



NOTES

400' surface rights reservation along the shores of all lakes and rivers.

DESCRIPTION	ORDER NO.	DATE	DISPOSITION
R-I SEC. 35	W-L-19/94 NER		S & m 94/03/24

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES. AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON

LEGEND

PATENTED LAND	P.
PATENTED FOR SURFACE RIGHTS ONLY	
LEASE	L.
LICENSE OF OCCUPATION	L.O.
CROWN LAND SALES	C.S.
LOCATED LAND	
CANCELLED	C.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
HIGHWAY & ROUTE NO.	(17)
ROADS	
TRAILS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	

* used only with summer resort Location in which space is limited

TOWNSHIP OF

McNEIL

DISTRICT OF
TIMISKAMING

LARDER LAKE
MINING DIVISION

SCALE : 1 INCH = 40 CHAINS (1/2 MILE)

DR.	D.K	PLAN NO.	M.300
DATE	18 2 71		

MINISTRY OF NORTHERN DEVELOPMENT AND MINES

SEE ARCHIVED COPY FOR LOCATION OF SURVEYS FOR TRP 9791, 9799, 979C, 9827, 9794, 9813 9793, 9826, 27815, 27816, 27817, 9787, 9815 9816, 9788, 27812, 27813, 27814, 27822, 27821 27806, 27825, 27826, 27827, 27828. SITUATED SOUTH OF THE 2 MILE MARK (RUNNING NORTH AND SOUTH) AND EAST OF THE 3 MILE MARK(RUNNING WEST TO EAST).

JUNE 5, 1995

UPDATED NOVEMBER 9, 1989

ARCHIVED JUNE 2, 1995

2.17340

200

42A02NW0014 2.17340 MCNEIL

Fasken Twp.
McNeil Twp.

Cleaver Twp.
McNeil Twp.

McNeil Twp.
Robertson Twp.

McNeil Twp.
Argyle Twp.

N

Hydro Line (Abandoned)

METB
FETB
CABA

Probable Contact
Possible Contact

3100 M. North of B.L.

88-6
88-5
88-08
88-09
88-10
88-11
88-13
86-5&7
86-8
86-9
87-3

CB1207685 (8 Claims)
CB1207684 (6 Claims)
CB1203944 (10 Claims)
CB1203946 (9 Claims)
CB1203947 (7 Claims)
CB1203945 (3 Claims)
CB1207683
CB1207612 (4 Claims)
CB1203943 (4 Claims)

WORK AREA No.2
WORK AREA No.1
WHITEFISH LAKE
SHERMAN LAKE EAST BLOCK
TOM FOX LAKE NORTH BLOCK

2.4 opt. Au
(82.0 grams / tonne) 618724
12' core intersection

Shaft, Trenches

Scotch Dyke
McMac Dyke
Isadore Dyke
8 Foot Dyke
Rogers Vein
South Dyke
Sherman Lk.
Tom Fox Lake

Lake
Oliver Lake

BASE LINE 0+00m (N87°W Grid)
TIE LINE 16+74S (M) (1987 Grid)

1997 PROPOSED CLAIM BLOCKS(2)

LOCATION PLAN
(With Reference To Gold Mines In Timmins & Kirkland Lake)

LEGEND
- GOLD MINE
- FAVORABLE VOLCANIC ROCK FOR GOLD DEPOSITION

Timmins
HOLLINGER
DOME
PAMOOSE
LONG 80°30'
LAT. 48°00'
McNeil Tp.
OLIVER GOLD PROPERTY
LAKESHORE
MACASSA
WRIGHT HARGREAVES
Kirkland Lake
SCALE (Miles) 0 4 8 12

G Granodiorite / Quartz Monzonite
C,A,B,A Calc Alkalic Basalt & Andesite
FETB Iron-Rich Tholellitic Basalt
METB Magnesium-Rich Tholellitic Basalt
Calc Alkalic Dacite & Rhyolite
Felsite Dykes (Gold Bearing)
Carbonate Rock
Fault (Probable)

ARCHEAN AGE ROCKS AS DIFFERENTIATED BY L.S. Jensen, 1992

OLIVER PROPERTY (Claim Blocks)
Patented Claims (Weekley)
Other Claims (Jan 1996)
Proposed Staking (1997)
NA2 NB2 VLF Geophysical Conductor
Magnetic (high) Anomaly
Areas Covered By 1987 Geophysical Surveys
WORK AREAS 1 & 2 Actual (96) Exploration Areas (I.P. Surveys, Geology Diamond Drilling)

1944 Diamond Drill Hole
1986 " " "
1987 " " "
1988 " " "
1996 " " "
Felsite Dyke Prospect
Weekley Gold Prospect

Proposed Base Line & Lines (1997)
(Control For IP & Magnetic Surveys)

Actual Base Line & Lines (1996)
(Control For Completed IP-EM Survey)

Leased Claims

Anomalous Gold
Proposed Mechanical Stripping (1997)

SCALE
0 1/4 1/2 3/4 1.0 1 1/4 1 1/2 MILES
0 1 2 KM

210

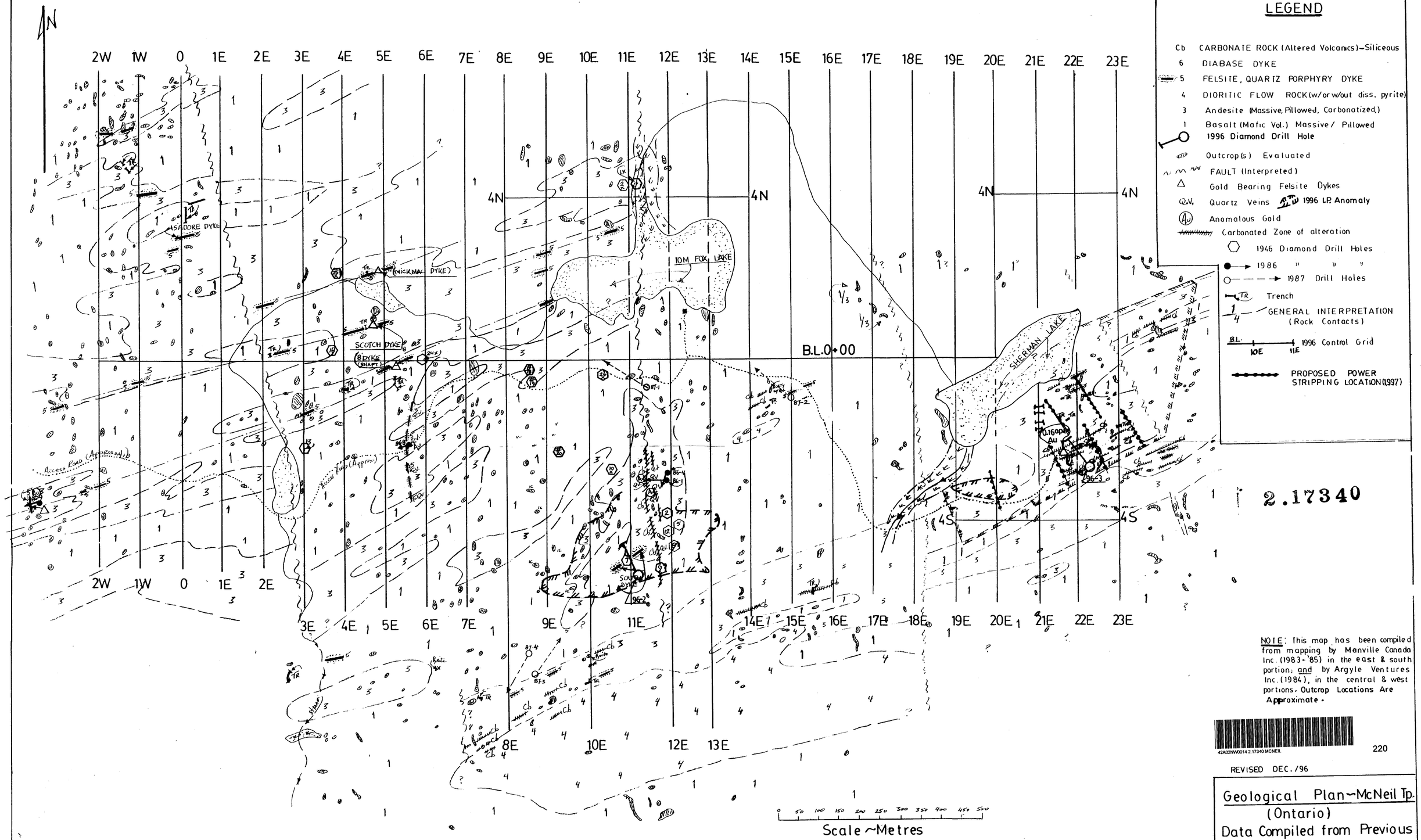
2.17340

PROFESSIONAL GEOLOGIST RALPH V. STEWART ALBERTA

Revised ~ Dec/96

GEOLOGY AND LOCATION PLAN
THE "OLIVER GOLD PROPERTY"
Mc Neil Township, Ont.

Drawn: R.V.S. January, 1996 | Scale: 1"=1/4 Mi. | Dwg. S 96-1



LEGEND

- Cb CARBONATE ROCK (Altered Volcanics)–Siliceous
- 6 DIABASE DYKE
- 5 FELSITE, QUARTZ PORPHYRY DYKE
- 4 DIORITIC FLOW ROCK (w/or w/out diss. pyrite)
- 3 Andesite (Massive, Pillowed, Carbonatized,)
- 1 Basalt (Mafic Vol.) Massive / Pillowed
- 1996 Diamond Drill Hole
- Outcrop(s) Evaluated
- FAULT (Interpreted)
- Gold Bearing Felsite Dykes
- Q.V. Quartz Veins — 1996 I.P. Anomaly
- Au Anomalous Gold
- Carbonated Zone of alteration
- 1946 Diamond Drill Holes
- 1986 " " "
- 1987 Drill Holes
- TR Trench
- 1/4 GENERAL INTERPRETATION (Rock Contacts)
- B.L. 10E 11E 1996 Control Grid
- PROPOSED POWER STRIPPING LOCATION (1997)

2.17340

NOTE: This map has been compiled from mapping by Manville Canada Inc. (1983-'85) in the east & south portion; and by Argyle Ventures Inc. (1984), in the central & west portions. Outcrop Locations Are Approximate.

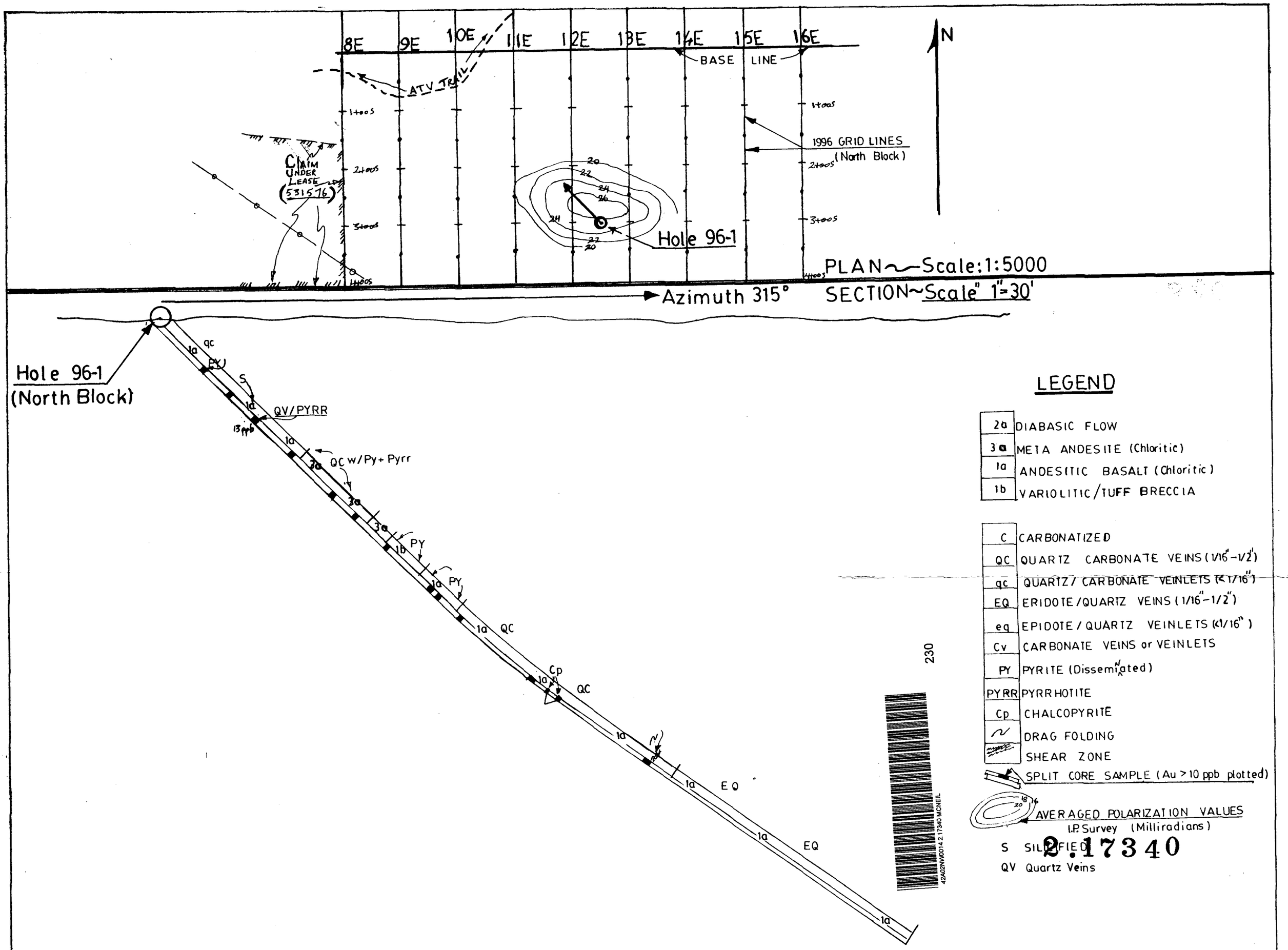
42A02NW0014 2.17340 MCNEIL 220

REVISED DEC./96

Geological Plan–McNeil Tp. (Ontario)

Data Compiled from Previous Mapping

Compiled by P.V. Stewart August/96 | SCALE 1:5000 | DWG S 96-11



LEGEND

2a	DIABASIC FLOW
3a	META ANDESITE (Chloritic)
1a	ANDESITIC BASALT (Chloritic)
1b	VARIOLITIC/TUFF BRECCIA

C	CARBONATIZED
QC	QUARTZ CARBONATE VEINS (1/16"-1/2")
qc	QUARTZ/CARBONATE VEINLETS (<1/16")
EQ	ERIDOTE/QUARTZ VEINS (1/16"-1/2")
eq	EPIDOTE/QUARTZ VEINLETS (<1/16")
Cv	CARBONATE VEINS or VEINLETS
PY	PYRITE (Disseminated)
PYRR	PYRRHOTITE
Cp	CHALCOPYRITE
~	DRAG FOLDING
	SHEAR ZONE

SPLIT CORE SAMPLE (Au > 10 ppb plotted)

AVERAGED POLARIZATION VALUES
I.P. Survey (Milliradians)

S SILICIFIED

QV Quartz Veins

Geological Section & Location Plan~Drill Hole 96-1

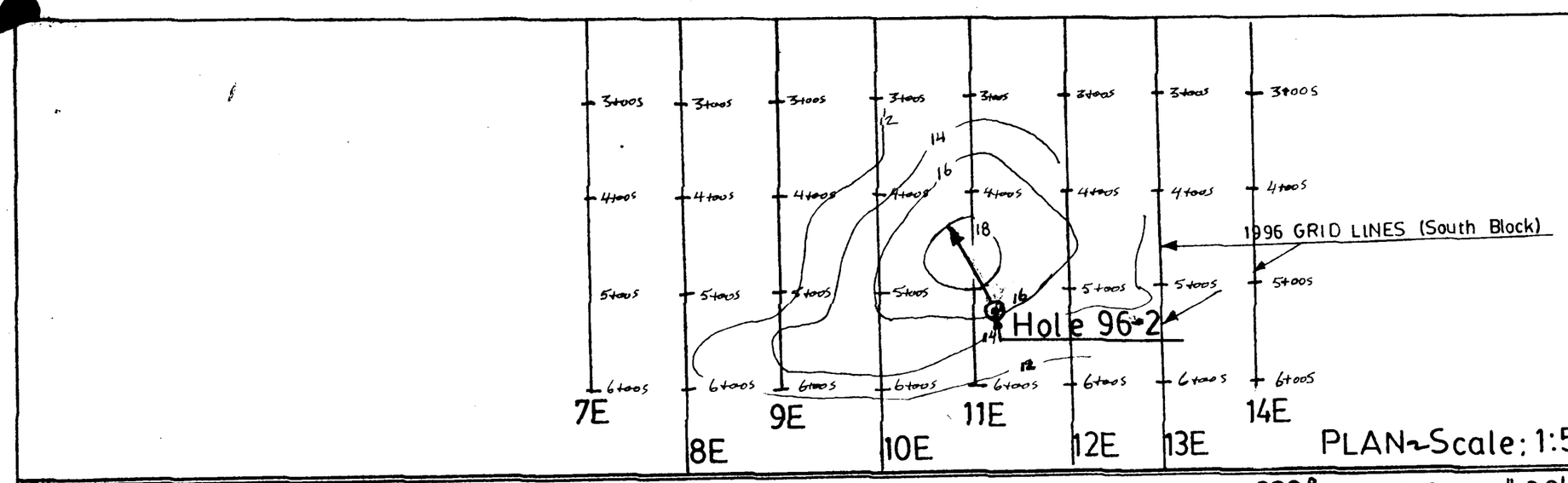
FOR

THE OLIVER GROUP/CANADIAN ZEOLITE LTD, JOINT VENTURE
McNeil Twp., Ontario

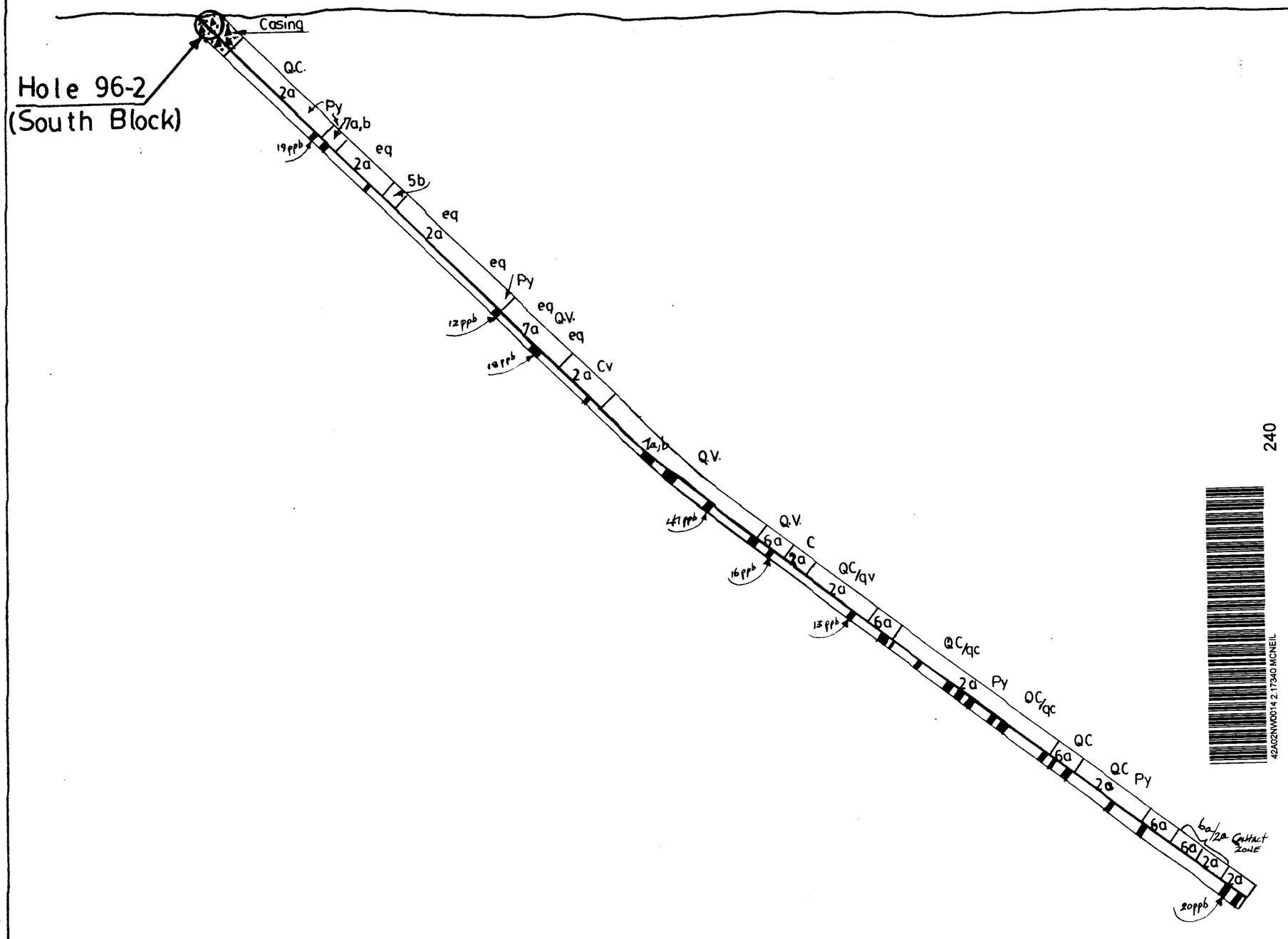
Drawn: R. Stewart Dec. 196

SCALE Plan: 1:5000 Section: 1"=30'

DWG. S 96-12



Azimuth 333° SECTION~1"=30'



LEGEND

FELSITE	7a,b	FELDSPAR/QUARTZ PORPHYRY (Dyke)
	7a	QUARTZ PORPHYRY (DYKE)
	6a	GRANODIORITE (DYKE)
	5b	META-GABBRO (DYKE)
	2a	META-ANDESITE
	C	CARBONATIZED Q.V. - Quartz Veins
	S	SILICIFICATION
	Q.C.	QUARTZ CARBONATE VEINS (1/16"-1/2")
	qc	QUARTZ/ CARBONATE VEINLETS (<1/16")
	EQ	EPIDOTE /QUARTZ VEINS (1/16"-1/2")
	eq	EPIDOTE /QUARTZ VEINLETS (<1/16")
	Cv	CARBONATE VEINS or VEINLETS
	PY	PYRITE (Disseminated)
	PYRR	PYRRHOTITE
	Cp	CHALCOPYRITE
		DRAG FOLDING
		SHEAR ZONE

SPLIT CORE SAMPLE (Au > 10 ppb plotted)

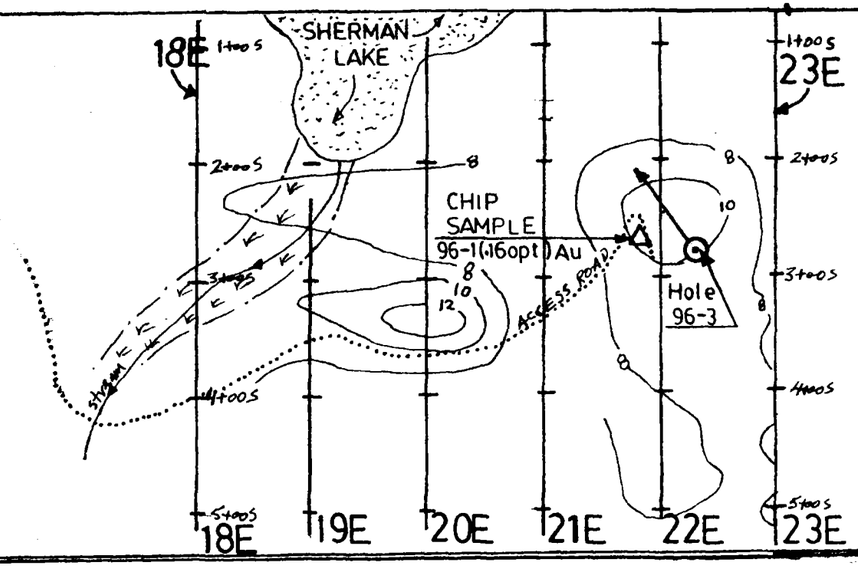
AVERAGED POLARIZATION VALUES
I.P. Survey (Milliradians)

2.17340

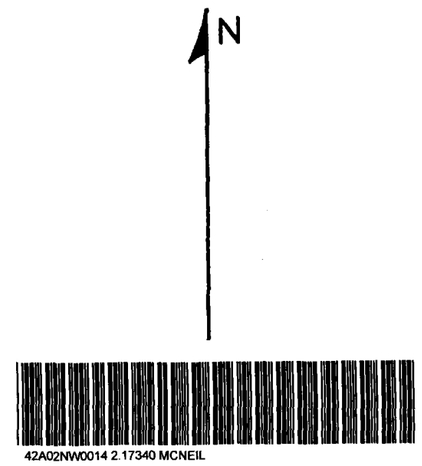
Geological Section & Location Plan~Drill Hole 96-2

FOR
THE OLIVER GROUP/CANADIAN ZEOLITE LTD., JOINT VENTURE
McNeil Twp., Ontario

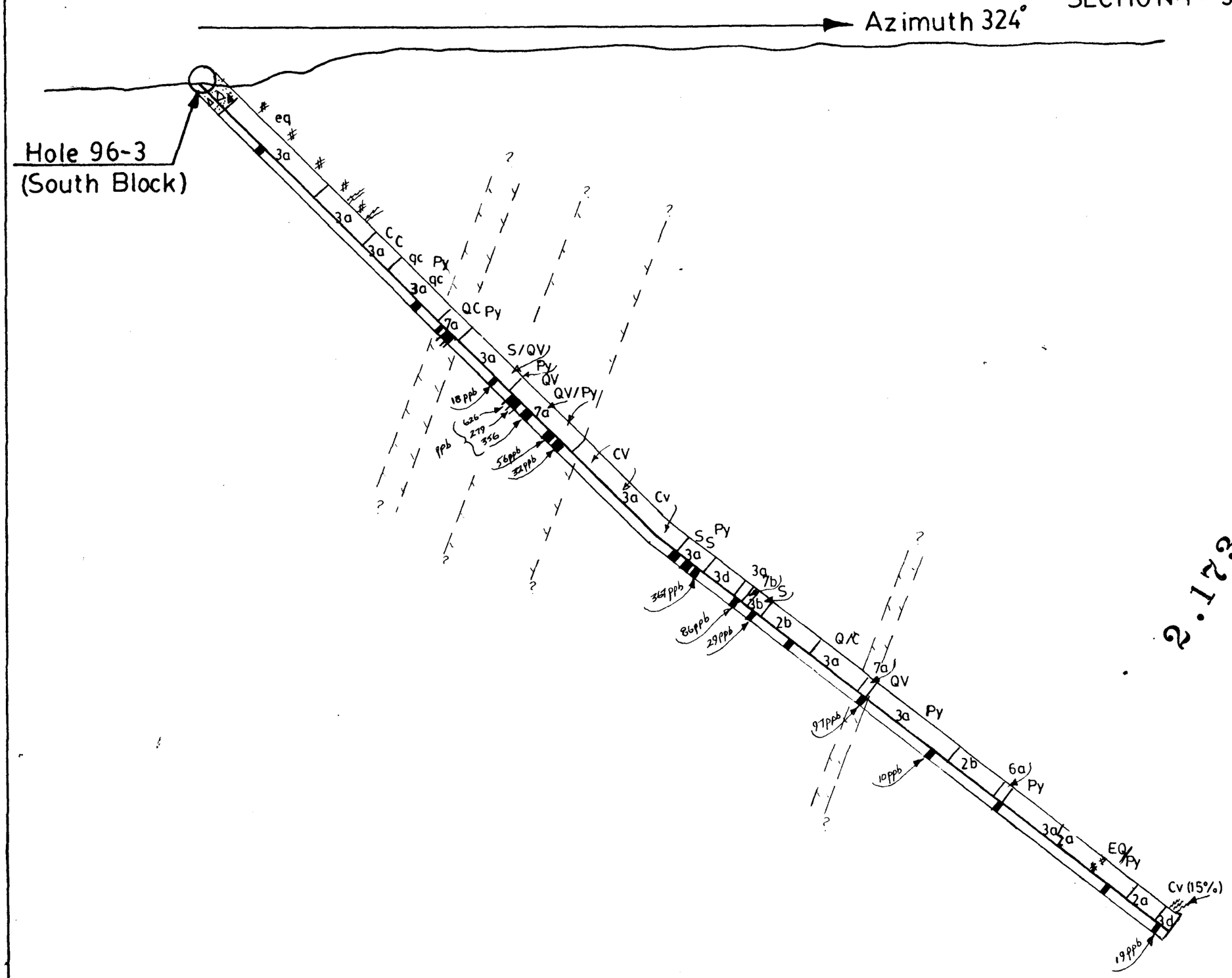
Drawn: K. Stewart Dec 1996	SCALE: Plan: 1:5000 Section: 1"=30'	DWG. S 96-13



PLAN Scale: 1:5000



SECTION: 1" = 30'



2.17340

LEGEND

7a, b	FELDSPAR/QUARTZ PORPHYRY (Dyke)
7a	QUARTZ PORPHYRY (DYKE)
6a	GRANODIORITE (DYKE)
3d	TALC CARBONATE ROCK
3b	VOLCANIC BRECCIA
3a	META-ANDESITE or Basaltic Andesite
2b	BASALTIC ANDESITE (VARIOLITIC)
2a	DIABASIC FLOW

C	CARBONATIZED
S	SILICIFICATION
Q.V.	QUARTZ VEINS
Q.C.	QUARTZ CARBONATE VEINS (1/16"-1/2")
q.c.	QUARTZ / CARBONATE VEINLETS (<1/16")
EQ	EPIDOTE /QUARTZ VEINS (1/16"-1/2")
eq	EPIDOTE / QUARTZ VEINLETS (<1/16")
Cv	CARBONATE VEINS or VEINLETS
PY	PYRITE (Disseminated)
PYRR	PYRRHOTITE
Cp	CHALCOPYRITE
# # # #	HIGHLY FRACTURED
	SHEAR ZONE

SPLIT CORE SAMPLE (Au > 10 ppb plotted)

8/10 AVERAGED POLARIZATION VALUES
I.P. Survey (Milliradians)

Geological Section & Location Plan — Drill Hole 96-3

FOR
THE OLIVER GROUP/CANADIAN ZEOLITE LTD., JOINT VENTURE
McNeil Twp., Ontario

DRAWN: R. Stewart Dec/96 SCALE: Plan: 1:5000 Sections 1"=30' DWG. S 96-14

200 W 100 W 0 100 E 200 E 300 E 400 E 500 E 600 E 700 E 800 E 900 E 1000 E 1100 E 1200 E 1300 E 1400 E 1500 E 1600 E 1700 E 1800 E 1900 E 2000 E 2100 E 2200 E

600 N
500 N
400 N
300 N
200 N
100 N
0
100 S
200 S
300 S
400 S
500 S
600 S
700 S

IP anomaly limits determined from pseudosections
Thin line = marginal anomaly
Thick line = definite anomaly

Scale 1:5000
50 0 50 100 150 200
(metres)

THE OLIVER GROUP

MCNEIL TOWNSHIP PROPERTY SOUTH GRID

INDUCED POLARIZATION SURVEY
AVERAGED RESISTIVITY VALUES
Values in ohm-metres/1000

Surveyed August-September, 1996

200 W | 100 W | 0 | 100 E | 200 E | 300 E | 400 E | 500 E | 600 E | 700 E | 800 E | 900 E | 1000 E | 1100 E | 1200 E | 1300 E | 1400 E | 1500 E | 1600 E | 1700 E | 1800 E | 1900 E | 2000 E | 2100 E | 2200 E

600 N
500 N
400 N
300 N
200 N
100 N
0
100 S
200 S
300 S
400 S
500 S
600 S
700 S

IP anomaly limits determined from pseudosections
Thin line = marginal anomaly
Thick line = definite anomaly

Scale 1:5000
50 0 50 100 150 200
(metres)

THE OLIVER GROUP

MCNEIL TOWNSHIP PROPERTY SOUTH GRID

INDUCED POLARIZATION SURVEY
AVERAGED POLARIZATION VALUES
Values in milliradians

Surveyed August-September, 1996

2.17340

280

IP anomaly limits determined from pseudosections

Scale 1:5000

50 0 50 100 150 200

(metres)

THE OLIVER GROUP

MCNEIL TOWNSHIP PROPERTY NORTH GRID

INDUCED POLARIZATION SURVEY
AVERAGED RESISTIVITY VALUES
Values in ohm metres

Surveyed July-August, 1996

IP anomaly limits determined from pseudosections

Scale 1:5000

50 0 50 100 150 200
(metres)

THE OLIVER GROUP

MCNEIL TOWNSHIP PROPERTY NORTH GRID

INDUCED POLARIZATION SURVEY
AVERAGED POLARIZATION VALUES
Values in milliradians

Surveyed July-August, 1996

3-10