GEOLOGICAL SURVEY BRANCH ASSESSMEN'T REPORT

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A GEOPHYSICAL REPORT ON AN INDUCED POLARIZATION SURVEY AND A TOTAL FIELD MAGNETIC SURVEY

GOLDEN EAGLE PROJECT TUTSHI LAKE AREA, BRITISH COLUMBIA

> N.T.S. 104 M/15 LATITUDE 59° 53' N LONGITUDE 134° 47' W ATLIN MINING DIVISION

CLAIMS SURVEYED:

CONNOR 1 GOLDEN EAGLE 2, & 3 TANNIS 1, 2, 3, 4, 5, 6, 7, 8, 9, & 11

SURVEY DATES: AUGUST 20th – AUGUST 30th, 2002

<u>OWNERS:</u>

MARKSMEN RESOURCES LTD.

OPERATOR:

MARKSMEN RESOURCES LTD.

REPORT PREPARED BY

FRANZ DZIUBA B.SC. OCTOBER 22, 2002

AURORA GEOSCIENCES LTD. WHITEHORSE, YUKON TERRITORY

SUMMARY

During the period August 20th, 2002 to August 30th, 2002, Marksmen Resources Ltd. contracted Aurora Geosciences Ltd. to complete time domain Induced Polarization (IP) and Total Field Magnetic measurements on the Golden Eagle, Conner and Tannis claims near Tutshi Lake, British Columbia. The surveys evaluated the property's potential to host precious metal rich sulphide mineralization. A total of 8.050 kilometres of IP surveying and 7.6875 kilometres of total field magnetic surveying were completed. Chargeability anomalies suggesting sulphide mineralization were outlined and these results should be combined with previous geological, geophysical and geochemical investigations in order to provide direction in designing a diamond drilling program.

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LIST OF MAPS

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Induced Polarization Pseudo-sections with magnetic profiles

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Line 0 Golden Eagle Area	1:2000	MRX0201BC - 001
Line 2W Golden Eagle Area	1:2000	MRX0201BC - 002
Line 3W Golden Eagle Area	1:2000	MRX0201BC - 003
Line 4W Golden Eagle Area	1:2000	MRX0201BC - 004
Line 6W Golden Eagle Area	1:2000	MRX0201BC - 005
Line 8W Golden Eagle Area	1:2000	MRX0201BC - 006
Line 10W Golden Eagle Area	1:2000	MRX0201BC-007
Line 12W Golden Eagle Area	1:2000	MRX0201BC - 008
Line 13W Golden Eagle Area	1:2000	MRX0201BC - 009
Line 14W Golden Eagle Area	1:2000	MRX0201BC - 010
Induced Polarization Pseudo-sections		
Line 4W Tannis Zone	1:2000	MRX0201BC - 011
Line 6W Tannis Zone	1:2000	MRX0201BC-012
Line 10W Tannis Zone	1:2000	MRX0201BC - 013
Stacked Induced Polarization Pseudo-sections		
Lines 0 – 8W Golden Eagle Area		
Chargeability	1:5000	MRX0201BC-014
Apparent Resistivity	1:5000	$\mathbf{MRX0201BC}-015$
Lines 10W – 14W Golden Eagle Area		
Chargeability	1:5000	MRX0201BC - 016
Apparent Resistivity	1:5000	MRX0201BC-017
Lines 4W – 10W Tannis Zone		
Chargeability	1:5000	MRX0201BC – 018
Apparent Resistivity	1:5000	MRX0201BC – 019
Induced Polarization Pseudo-sections and Recov	vered Models	
Line 0 Golden Eagle Area		
Chargeability	1:2000	MRX0201BC - 020
Apparent Resistivity	1:2000	MRX0201BC - 021
Line 2W Golden Eagle Area		
Chargeability	1:2000	MRX0201BC - 022
Apparent Resistivity	1:2000	MRX0201BC - 023
Line 3W Golden Eagle Area		
Chargeability	1:2000	MRX0201BC - 024
Apparent Resistivity	1:2000	MRX0201BC - 025

Line 4W Golden Eagle Area		
Chargeability	1:2000	MRX0201BC - 026
Apparent Resistivity	1:2000	MRX0201BC - 027
Line 6W Golden Eagle Area		
Chargeability	1:2000	MRX0201BC - 028
Apparent Resistivity	1:2000	MRX0201BC - 029
Line 8W Golden Eagle Area		
Chargeability	1:2000	MRX0201BC - 030
Apparent Resistivity	1:2000	MRX0201BC - 031
Line 10W Golden Eagle Area		
Chargeability	1:2000	MRX0201BC - 032
Apparent Resistivity	1:2000	MRX0201BC - 033
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Chargeability	1:2000	MRX0201BC - 034
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Chargeability	1:2000	MRX0201BC - 036
Apparent Resistivity	1:2000	MRX0201BC - 037
Line 6W Tannis Grid		
Chargeability	1:2000	MRX0201BC - 038
Apparent Resistivity	1:2000	MRX0201BC - 039
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Chargeability 21 point filter Camp Zone	1:2000	MRX0201BC - 046
Resistivity 21 point filter Camp Zone	1:2000	MRX0201BC - 047
Chargeability 21 point filter Tannis Zone	1:2000	MRX0201BC - 048
Resistivity 21 point filter Tannis Zone	1:2000	MRX0201BC - 049

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1.0 INTRODUCTION

During the period August 20th, 2002 to August 30th, 2002, Marksmen Resources Ltd. contracted Aurora Geosciences Ltd. to complete time domain Induced Polarization (IP) and Total Field Magnetic (Mag) measurements on the Golden Eagle, Conner and Tannis claims near Tutshi Lake, British Columbia. The surveys evaluated the property's potential to host a precious metal rich sulphide deposit similar to Eskay Creek Mines, or Pogo Alaska, which share similar geological settings to the Golden Eagle Area and Tannis Zone. These surveys covered the main showings on the property and attempted to confirm previous IP results. The scope of this report however shall be limited to the description and examination of the August, 2002 geophysical surveys and data.

The IP and Mag surveys were carried out on survey lines installed by a line cutting crew contracted by Marksmen Resources Ltd. Station spacing was kept constant (as opposed to slope-corrected) to accommodate the fixed length of the IP receiver cables. The author, who was present for the IP survey as the crew chief, recorded survey grid locations as NAD 83, UTM zone 8 coordinates, using a Garmin 76 non-differential global positioning satellite (GPS) receiver .These are presented in Table 1.0, Grid Coordinates.

Measurements of apparent chargeability and resistivity were taken using a pole-dipole electrode array. A dipole spacing of fifty metres extending to six separations (n=1, 6) was used. The data were plotted in a pseudo-section format and as plan maps. Modeling of the IP data was also done, using the University of British Columbia (UBC) Geophysical Inversion Facility's DCIP2D program library, and plots of the results are presented in this report.

Total Field Magnetic surveying was completed only over the Golden Eagle area. Plan maps of the data are included in this report. Profiles of the magnetic data were plotted on the IP pseudosections.

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	GRID COORDIN		D 83 zone 8 RDINATES	
Line	Station	Area	Easting	Northing
14W	500N	Golden Eagle Area	515840	6630823
14W	2005	Golden Eagle Area	515260	6630500
13W	450S	Golden Eagle Area	515740	6630501
13W	0	Golden Eagle Area	516000	6630851
12W	475S	Golden Eagle Area	515775	6630399
12W	0	Golden Eagle Area	516100	6630751
10W	1550N	Golden Eagle Area	516681	6631210
10W	50N	Golden Eagle Area	515688	6630110
8W	750N	Golden Eagle Area	516859	6631181
8W	0	Golden Eagle Area	516380	⁻ 6630618
6W	600S	Golden Eagle Area	516581	6630439
6W	0	Golden Eagle Area	516940	6630880
4W	600N	Golden Eagle Area	517060	6630800
4W	200S	Golden Eagle Area	516540	6630214
3W	600N	Golden Eagle Area	517080	6630598
3W	100N	Golden Eagle Area	516727	6630305
2W	550N	Golden Eagle Area	517201	6630602
2W	100N	Golden Eagle Area	516940	6630270
0	50N	Golden Eagle Area	517337	6630429
0	3005	Golden Eagle Area	517104	6630200
6W	850N	Tannis Zone	509354	6637660
6W	250N	Tannis Zone	509236	6637125
6W	450N	Tannis Zone	509295	6637290
6W	175N	Tannis Zone	509235	6637070
10W	300N	Tannis Zone	509090	6637620
10W	250S	Tannis Zone	508878	6637140
4W	650N	Tannis Zone	509610	6637370
4W	100N	Tannis Zone	509279	6637025

Table 1.0Grid Coordinates

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2.0 **PROPERTY DESCRIPTION AND LOCATION**

The property is located in the Atlin Mining Division of British Columbia, near the southern half of Tutshi Lake (figure 2.0) and consists of two blocks of claims (figures 2.1 and 2.2). The first block, which will be referred to in this report as the Golden Eagle Area, consists of the following claims:

Claim Name	Tenure Number	Map Number	Area	Work Recorded To
Golden Eagle 2	367760	104M087	9 units	January 1, 2005
Golden Eagle 3	367761	104M087	15 units	January 1 2005

104M087

9 units

September 10, 2005

Table 2.0 Gold	len Eagle	Area	Claim	Informa	tion	Summary
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The above claims are 100% owned by Marksmen Resources Ltd.

389673

The second block, which will be referred to in this report as the Tannis Zone, consists of the following claims:

Claim Name	Tenure Number	Map Number	Area	Work Recorded To
Tannis 1	389674	104M086	1 unit	September 10, 2003
Tannis 2	389675	104M086	1 unit	September 10, 2003
Tannis 3	389676	104M086	1 unit	September 10, 2003
Tannis 4	389677	104M086	1 unit	September 10, 2003
Tannis 5	392801	104M086	12 units	April 18, 2003
Tannis 6	392802	104M086	12 units	April 19, 2003
Tannis 7	392803	104M086	10 units	April 18, 2003
Tannis 8	395713	104M086	12 units	August 10, 2003
Tannis 9	395714	104M086	16 units	August 9, 2003
Tannis 11	395715	104M087	1 unit	August 9, 2003

Table 2.1	Tannis Zone	Claim Inf	ormation	Summarv
				NO WE ARABASING A

The above claims are 100% owned by Marksmen Resources Ltd.

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Aurora Geosciences Ltd.

3.0 ACCESSIBILITY

The property is located in northwestern British Columbia in the transition between the Boundary Ranges of the Coast Mountains and the Teslin Plateau of the Interior Plateau. The claims are situated on the east and west sides of Tutshi Lake, between elevations of 900 and 1800 metres above sea level. Tree line is at approximately 1300 metres above sea level. Access to the survey grids was by means of helicopter from a staging area / camp set up on the west shore of Tutshi Lake, a few hundred metres off of the paved Klondike highway which connects Carcross, Yukon Territory and Skagway, Alaska.

4.0 HISTORY

Exploration in the area began around the turn of the century with the discovery of the nearby Venus Mine. Mapping, prospecting, trenching and blasting were completed, however no documentation survives from this period.

Exploration was dormant until 1985 when Noranda became interested in the area's potential to host a volcanogenic massive sulphide deposit. Their work on the property carried on till 1988. The work comprised of staking and rock, soil and silt sampling with an AERODAT geophysical survey flown in 1987. A limited Induced Polarization survey and two diamond drill holes were completed in 1988. Significant gold in soil anomalies, as well as gold mineralization in bedrock and float, were identified in two areas, the Camp and the Carbonate zones. Meanwhile, in 1988, the Frame Mining Corporation staked claims on the west side of Tutshi Lake. They carried out a limited gold exploration program including a 1989 Induced Polarization survey on their Catfish claims (now the Tannis Zone). Both Noranda and Frame Mining Corporation relinquished their ownership of the property and the ground was staked by R.H. McMillan in 1997 and in 2001 was optioned to Marksmen Resources Ltd.

Regional geological mapping was completed by the G.S.C. in 1957 (Christie) and the B.C.G.S branch in 1997 (Mihalynuk) as well as stream sediment sampling by the British Columbia government in 1988 and 1993.

5.0 GEOLOGICAL SETTING

The reader is referred to the British Columbia Energy and Mineral Division Geological Survey Branch Geosciences Map 1997 - 1 "Geology of the Tagish Lake Area" compiled by M.G. Mihalynuk.

The property occupies an area of British Columbia where Late Cretaceous and Tertiary intrusive rocks of the northwest trending Coast Belt intrude the Mesozoic arc volcanic and arc-derived sedimentary rocks of the Intermontane Belt.

Locally, the Golden Eagle Area and Tannis Zone are underlain by layered rocks of the Devonian to Permian aged Boundary Ranges Metamorphic Suite, Upper Triassic Stuhini Group volcanic rocks and Lower Jurassic Laberge Group sedimentary rocks. A major structure, the north – northwest trending Llewellyn Fault, cuts through the property separating the Boundary Ranges Group from the Stuhini Group. Mesozoic granodiorite is primarily confined to this Llewellyn Fault Zone.

Mineralization occurs in a northwest trending zone of sheared mafic volcanics and granodiorite at the Camp Zone. Disseminated arsenopyrite, pyrite, galena and sphalerite occur in the quartz-carbonate altered Stuhini Group volcanics of the Carbonate Zone. (MINFILE 104M 057). On the Tannis zone mineralization is encountered in northeast trending quartz veins which have an arsenopyrite rich core (MINFILE 104M 061).

6.0 GEOPHYSICAL SURVEY SPECIFICATIONS

6.1 INDUCED POLARIZATION SURVEY

The induced polarization (IP) survey was completed over the Golden Eagle Area (with its Carbonate and Camp Zones) and the Tannis Zone on survey lines oriented roughly northeast – southwest (figures 6.0 and 6.1). The IP equipment consisted of a GDD 2.8 Kw digital IP transmitter, one Iris Instruments Elrec-6 IP receiver, and a Honda Generator. A pole-dipole array was utilized for the entire survey. The electrode arrangement is illustrated on the pseudo-sections accompanying this report. The survey was carried out using a dipole spacing of fifty metres (a=50) and six separations (n = 1, 6) over a total of 8.050 kilometres.

The apparent resistivity and apparent chargeability data are presented in pseudosection format at a scale of 1:2,000 (see maps in pocket). As well, the raw data were input into the UBC Inversion program in order to create inversion models for both apparent resistivity and apparent conductivity.

6.2 TOTAL FIELD MAGNETIC SURVEY

Total field magnetic surveying was done over the Golden Eagle Area with GSM-19T digital proton precession magnetometers manufactured by GEM systems of Canada. Diurnal or other erratic variations in the Earth's magnetic field were corrected for with the use of a magnetometer base station recording the total magnetic field every ten seconds. The instrument operator made sure to divest himself of any objects containing iron before proceeding to survey and, as the entire survey was completed in one day, by one operator, there was no need to level the data. Measurements of the total magnetic field were taken every 12.5 metres on the survey lines for a total of 7.6875 kilometres.

The corrected magnetic data are presented as profiles on the induced polarization pseudo-sections and as 1:2,000 scale colour contoured plan maps.

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Figure 6.0 Golden Eagle Area Survey Lines

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Figure 6.1 Tannis Zone Survey Lines

7.0 DISCUSSION OF RESULTS

A line to line examination of chargeability pseudo-sections shows a low background chargeability of four to six millivolts per volt and outlines distinct anomalies which suggest sulphide mineralization. The inversion models may be used to better delineate the lateral extent and depth to top of the causative bodies.

7.1 CARBONATE ZONE

Anomalous zones observed on the Carbonate zone data can be ranked by their apparent chargeability and resistivity values as well as size and shape.

Type 'A' chargeability highs are twice that of background, with low apparent resistivities, less than 300 ohm metres. They extend to the surface and cover several sets of readings. They are observed on the north ends of Lines 0, 2W and 4W and on the south ends of 4W and 6W. These responses represent black shales and due to their shallow depth the source of these anomalies may be determined by geologic mapping.

Type 'B' anomalies can be seen trending north northwest from Line 3W at station 175N to Line 6W at station 450S and from Line 8W at station 425N to Line 10W at 1375N. They are moderate chargeability highs, on the order of 50 percent above background, with apparent resistivities greater than 1000 ohm metres. Their features are within 25-50 metres of the surface. They are narrow zones, documented on consecutive readings. This type of response is expected from a sulphide bearing vein-like source.

Type 'C' anomalies are broad deep responses, with chargeability highs 50% above background and no resistivity signature. They trend northwest from Line 0 to Line 6W and are absent on Lines 8W and 10W.

The magnetic field strength varies over the Carbonate Zone from a low of 58500 nanoteslas (nT) to a high of 59500 nT with a mean reading of 58800 nT. A line can be drawn between magnetic low (less than 58800 nT) and high (greater than 58800 nT) provinces, trending in a north northwest direction along the northern as well as southern ends of the survey lines. A linear magnetic contact has been documented between rocks of high magnetic susceptibilities, the basic volcanic rocks of the Stuhini group, and low magnetic susceptibilities, such as shales or limestones. A series of semi continuous magnetic highs, 350 to 400 nT above background, are coincident with the Type B IP anomalies.

7.2 CAMP ZONE

The northern parts of the survey lines on the Camp zone are dominated by strong chargeability highs, values greater than 25mV/V. These chargeability highs are coincident with apparent resistivities of less than 100 ohm metres. These are

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signature responses of graphitic shales which reportedly underlie the area. This zone terminates along a SE – NW line from Line 10W, 475N to Line 14W, 325N.

Pantleg chargeability anomalies are observed on Line 10W at 250N and on Line 14W at 50N. Due to the rocky ground and severe topography lines 12W and 13W were not installed in this area. The anomalous values here are twice the background of 10 to 12 mV/V. Models generated by the UBC geophysical inversion facility's DCIP2D program library indicate that these anomalies are caused by chargeable bodies with limited depth extent (75 metres to 125 metres). They occur near surface and occupy areas of lower apparent resistivity. There are no significant magnetic features associated with these anomalies.

7.3 TANNIS ZONE

Three lines of induced polarization surveying completed on the Tannis zone show well defined chargeability anomalies on Lines 4W and 6W. A fairly well defined chargeability anomaly occurs on Line 10W. No total field magnetic readings were taken over this area.

Increased chargeability anomalies are centered at 350N on Line 4W and 450N on Line 6W with values up to five times that of background. Both anomalies are narrow near the surface and have a deeper and broader component. The causative source for this anomaly may be a combination of two or more bodies; however the dipole spacing of 50 metres employed makes it impossible to resolve features of similar chargeability in close contact to each other. Modeling of the anomaly, done using the UBC geophysical inversion facility's DCIP2D program library, generates a body which is narrow near the surface and broadens with depth.

An apparent resistivity low observed on Line 4W at 200N is explained by a large previously mapped fault (Nebocat). The apparent resistivity inversion model delineates this feature. This fault separates rhyolites to the southwest from metamorphic rocks to the northeast. A similar apparent resistivity low is observed on Line 6W at 400N. Less distinct apparent resistivity lows on Line 4W at 500N and Line 6W at 700N may also indicate faults.

Moderate chargeability anomalies are observed on the northern end of Line 10W, and remain open to the north. The inverted model of Line 10W shows these anomalies to be caused by both near surface and deeper sources. The apparent resistivity is lower, suggesting a thickening cover of overburden.

8.0 CONCLUSIONS

During the period between August 20th, 2002 and August 30th, 2002, Marksmen Resources Ltd. contracted Aurora Geosciences Ltd. of Whitehorse, Yukon Territory to complete a small ground geophysical program. This geophysical program comprised time domain Induced Polarization and Total Field Magnetic measurements on Marksmen Resources' Golden Eagle, Conner and Tannis claims near Tutshi Lake, British Columbia. These surveys were used to help evaluate the property's potential to host a precious metal rich sulphide deposit.

A qualitative analysis of the data suggests that the location and lateral extent of the zones of moderate chargeability are in direct correlation to sulphide mineralization. The total magnetic field data were useful in delineating lithologies but only on the Carbonate zone was there a correlation between magnetic highs and chargeability anomalies.

A compilation using all available geological, geophysical and geochemical data should be undertaken in order to provide direction in designing a diamond drilling program.

Respectfully submitted,

AURORA GEOSCIENCES LTD.

uba, B Fran 2 Dzi Geophysicist

REFERENCES

Mihalynuk, Mitchell G. P.Geo (1997): Geology and Mineral Resources of the Tagish Lake Area (NTS 104M/8, 9, 10E, 15 and 104N/12W), Northwestern British Columbia. (Bulletin; 105) *British Columbia Geological Survey Branch*

Mihalynuk Mitchell G. P.Geo (1997): Geosciences Map 1997 – 1 "Geology of the Tagish Lake Area" British Columbia Geological Survey Branch

MINFILE (2002): Moon Lake, MINFILE 104M 057;

BC Ministry of Energy and Mines, MINFILE digital data, posted October 1, 2002 URL

http://www.em.gov.bc.ca/cf/minfile/search/search.cfm?mode=masterreport&minf ilno=104M%20%20057

MINFILE (2002): Catfish, MINFILE 104M 061;

BC Ministry of Energy and Mines, MINFILE digital data, posted October 1, 2002 URL

http://www.em.gov.bc.ca/cf/minfile/search/search.cfm?mode=masterreport&minf ilno=104M%20%20061

Telford, et al (1976): Applied Geophysics

New York: Cambridge University Press.

STATEMENT OF QUALIFICATIONS

I, Franz Dziuba, of the City of Yellowknife, in the Northwest Territories, Canada,

HEREBY CERTIFY:

- 1. That my address is 3502 Raccine Road, Yellowknife NT X1A 3J2 Canada
- 2. That I am a graduate of the University of British Columbia in 1986 with a B.Sc. in Geophysics.
- 3. That I have been a practising as a Geophysicist since 1989.
- 4. That I am a Geophysicist in the Northwest Territories, Canada.
- 5. That I hold no interest, direct or indirect, in the securities or properties of Marksmen Resources Ltd., nor do I expect to receive any.

Date this <u>22</u> day of <u>OCTOBER</u>, 20<u>02</u> at Yellowknife, NT.

Franz Dziubą, Geoplysic

<u>APPENDIX</u>

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COST OF SURVEY

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Aurora Geosciences Limited charged Marksmen Resources Limited for the Induced Polarization and Total Field Magnetic Survey on a daily basis. Mobilization and demobilization, vehicle, expediting and reporting costs were extra.

Mobe / Demobe	
Fixed cost	\$970.00
IP survey	\$17,595.00
9 days @ \$1,955.00/day	
Mag Survey	\$525.00
1 day @ \$525.00/day	
- Line Cutting	\$500.00
2 days @ \$250.00/day	
Expediting (round trip to Tutshi Lake)	\$180.00
4 hours @ \$45.00/hour	
Vehicle charges	\$165.00
(1/2 day rental + mileage)	

Prep	\$100.00
Cost of Report	\$2,900.00
Fixed cost	

Subtotal	\$22,935.00
Federal GST	\$1,605.45
Total	\$24,540.45

PERSONNEL EMPLOYED ON SURVEY

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NAME	OCCUPATION	ADDRESS	DATE
Franz Dziuba	Geophysicist	Aurora Geosciences Ltd.	August 20 – 30, 2002
		Yellowknife NT X1A 312	
Gary Lee	Geophysical Technician	Aurora Geosciences Ltd.	August 20 – 30, 2002
		108 Gold Road	
		Whitehorse, YT X1A 2W3	
John Bogle	Geophysical Technician		August 20 – 30, 2002
Eric Martinsen	Geophysical Helper	66	August 20 – 30, 2002
Warren Kapaniuk	Geophysical Helper	٠.	August 27 – 30, 2002

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AURORA GEOSCIENCES LTD. SURVEY LOG JOB MRX-02-01-BC IP/MAG SURVEY MARKSMAN RESOURCES LTD.

- Period:
- August 20, 2002 August 30, 2002
- Personnel:

Franz Dziuba (FD) - Crew chief Gary Lee (GL) - Technician John Bogle (JB) - Technician Eric Martinsen (EM) – Helper Warren Kapaniuk (WK) - Helper

Tues. August 20 Mobilization FD and JB drive to camp ,located on the shores of Lake Tutshi, after dinner. Travel time of about 1 and a half hours. Set up tent and charge batteries.

Wed. August 21 Mobilization/Survey
Wait arrival of JB and EM before flying out to Golden Eagle area – 9:30 a.m.. Poor ground contacts + conductive ground = low Vp (less than 1mV at n=4).Decide to switch to pole – dipole array with 50m dipoles n=1,6.Read L13W , 0 – 450S and L12W 0 – 50S.
Worked 9:30 – 6:00
Production 500m
Weather Fog,wind,rain squalls

Thur. August 22 Survey

Finish reading L 12W 50S – 300S by 10:00 a.m. and move to L14W.This line is all along talus. Read 500N - 50S and wind up wire. Tx. Site is broken down and prepared to move tomorrow. Worked 8:00 – 6:45 Production 800m Weather Overcast

Fri. August 23	Survey Move Tx. Setup to new position, put out infinite and read L 10W from 1700N to 350N. Worked 8:00 – 6:00 Production 1350m Weather Windy and cool
Sat. August 24	Survey Finish reading L10W, 350N – 100N wind up wire and read L8W ,800N – 150N and L6W, 0 - 550S. Worked 8:00 – 6:00 Production 1450m Weather Overcast, calm winds
Sun. August 25	Survey Read L4W , 600N – 100S , L3W, 650N – 150N and 2W,600N –150N. Worked 8:00 – 6:00 Production 1650m Weather Overcast with sunny periods, calm winds
Mon. August 26	Survey Unsettled telluric noise in a.m. quiets down and we read L0 from 100N – 350S.Wind up all wire, pack up Tx. setup and move gear to the Tannis grid area. Lay out infinite and C1 to L6W.Heavy cover of slide alders hamper our efforts. At the request of the client we send EM to assist the line cutting. Read L6W, 900N – 650N. Worked 8:00 – 6:00 Production 700m Weather overcast
Tues. August 27	Survey Warren Kapaniuk arrives in a.m to join the I.P. crew. EM will continue to help the line cutter. We cannot fly To the Tannis grid till1:00 p.m. due to weather conditions low clouds. Steady rain causes grounding problems with the potential wires. Trouble shoot all afternoon. Wind up all wires so that They can dry in camp overnight. Worked 1:00 – 6:00 Production 350m Weather Rain

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Wed. August 28	No Survey Due to weather (heavy rains) it is decided not to survey today. Crew goes to Whitehorse for the day
Thur. August 29	Survey Read L6W, 550N – 150N and L10W, 350N – 200S.EM assists the Line cutter. Worked 8:00 – 6:00 Production 950m Weather overcast
Fri. August 30	Survey Sling gear to new site, put out infinite and read L4W, 700N – 150N. EM is back on the IP crew as JB conducts a mag. Survey over the Golden Eagle grid. Pack up gear, and return to Whitehorse. Worked 8:00 – 5:00 Production (I.P.) 550m

Summary:

1.1

I.P. – 9 survey days. Total kilometers read (from C1 to C1) 8050 m at 50m station spacing, n 1 to 6 Mag. – 1 survey day. Total kilometers read 7687.5 m at 12.5m station spacing.

SPECIFICATIONS FOR THE TIME DOMAIN INDUCED POLARIZATION SURVEY

The time domain induced polarization system employed for this survey uses a digital six channel receiver, built by Iris Instruments of France, a 2.8 Kilowatt (Kw) digital IP transmitter, built by Instrumentation GDD Inc. of Canada and is powered by a 5 Kw Honda motor generator. A '2 second current on, 2 second current off' pulse is sent into the earth via the IP transmitter and two stainless steel electrodes, C₁ and C₂. The value of the current (I) is measured in amperes. The voltage $(V_{\rm P})$ produced by the 'current on' portion of the pulse is measured between a set of potential electrodes P_1 and P_2 by the receiver and is recorded in millivolts. During the 'current off' portion of the pulse, the voltage between P1 and P_2 decays according to the material present. Chargeability is defined as the integral of the decay curve over time. The decay curve is sampled at semi logarithmic intervals starting 80 milliseconds after the current shut off, using ten time windows of 80, 80, 80, 80, 160, 160, 160, 320, 320 and 320 milliseconds respectively. The weighted average value of these individual chargeabilities is then computed, resulting in an apparent chargeability (M_a) in millivolts per volt. The apparent resistivity (R_a) in ohm metres is obtained by combining the ratio of the primary voltage (Vp) and the current (I) with a coefficient that is determined by the electrode configuration being used, which for this survey is the pole – dipole electrode arrangement.

This type of array is well suited for surveying in rugged terrain as it requires fewer electrodes to be moved and in the case when poor contact resistance due to rocky ground is encountered, allows reliable chargeability measurements when the transmitted current is low. The arrangement is illustrated on the pseudo sections accompanying this report. Depth of investigation and sensitivity to the size of the target are controlled by adjusting the dipole spacing (a) and the separation (n) from the transmitting pole, which are determined in part by the expected width and depth of the mineralization. Considering this, the survey was carried out using a dipole spacing of fifty metres and six separations (n = 1, 6).

INSTRUMENT SPECIFICATIONS - THE GDD 2.8 Kw IP TRANSMITTER

The GDD 2.8 Kilowatt IP transmitter is designed and manufactured by Instrumentation GDD Inc.

Features

Protection against short circuits even at zero (0) ohms Output voltage range: 150 V to 2200 V Power source: 120 V / 60 Hz - Optional: 220 V / 50 Hz Operates from a light backpackable standard 120 V generator

Specifications

Size	21 x 34 x 39 cm		
Weight approx	20 kg		
Operating temperature	-40°C to 65°C		
Duty cycle	2 sec. current ON 2 sec. current OFF		
Output current range	0.005 to 10 A		
Output voltage range	150 to 2200 V		
Power source	any standard motor/generator 120 V / 60 Hz		
Output current LCD	reads to $\pm 0,001$ A		
Very cold weather	standard LCD heater		
Protection	Total protection against short circuits even at zero		
	(0) ohms		
Indicator lamps	High voltage ON-OFF		
	Output overcurrent		
	Generator over or undervoltage		
	Overheating		
	Logic failure		
	Open loop protection		

<u>INSTRUMENT SPECIFICATIONS - THE IRIS ELREC – 6 DIGITAL SIX</u> <u>CHANNEL IP RECEIVER</u>

(Reprinted from the Iris Instruments ELREC – 6 Operating manual v9.4)

MEASURED PARAMETERS

- Measurement and display of the voltage, the Self Potential, the IP chargeability (10 fully programmable or preset IP windows), the standard deviation and display of the intensity of current if previously keyed in.
- Continuous stacking of measurements (for noise reduction), display of the number of stacks.
- Computation and display of the apparent resistivities and chargeabilities for main electrode arrays : dipole-dipole, pole-dipole, pole-pole, gradient, Schlumberger, Wenner.... For six dipoles simultaneously.
- Test of internal power supply, test of ground resistance of electrodes 1, 3, 4, 5, 6, 7 with respect to 2 (value given between 0.1 kohm and 467 kohm). This test can be manual: RS CHECK function and this test is also automatic at the beginning of each measurement.
 - Test of noise level before the measurements (MONITOR function)
 - Storage data in the internal memory (up to 2505 readings). The data which are stored for each reading are:
 - Station and line numbers, type of electrode array, lengths of lines, voltage, intensity, Self Potential, time parameters, 10 chargeability values, standard deviation, the date and time of measurement.

SPECIFICATIONS

- 6 input channels
- Input impedance: 10 Mohm.
- Input overvoltage protection up to 1000 Volts
- Input voltage range each dipole : 10V maximum
 - sum of voltages dipoles 2 to 6 : 15V maximum
- Automatic stacking, automatic SP bucking (-10V to +10 V)
- 50 to 60 Hz power line rejection
- Common mode rejection: 100dB (for Rs = 0)
- Primary voltage resolution: 1µV after stacking

- accuracy typ. 0.3%; max 1 over the whole temperature range

- Battery test: manual and automatic before each measurement.
- Grounding resistance measurement from 0.1 to 467 kohm
- Memory capacity: 2505 measurements.
- Transfer rates: 300 to 19200 bauds
- Serial link for data transfer to a printer or a micro computer.
- Remote control of the unit through the serial link (speed : 19200 bauds)
- Up to 10 chargeability windows

- Signal waveform: symmetrical time domain (ON +, OFF, ON -, OFF) with a pulse duration (ON TIME) of 0.5, 1, 2, 4 and 8 s.
- Four available IP curve sampling choices, three of them are preset times and the fourth one has 10 fully programmable windows.
- Automatic stacking, automatic SP bucking (-10V to +10V) with linear drift correction up to 1 mV/s.
- Sampling rate: 10 ms.
- Accuracy in synchronization : 10 ms.
- Minimum voltage for synchronization windows : 40µV
- Chargeability resolution: 0.1 mV/V Accuracy typical: 0.6%, max 2% of reading ± 1 mV for Vp >10 mV
- Each dipole measurement is stored individually in one memory location

GENERAL SPECIFICATIONS

- Weather proof case
- Dimensions : length 310 mm, width 210 mm, height 210 mm (12.2 x 8.3 x 8.3 inch)
- Weight : 5.2 kg (11.5 pounds) without drycells 6 kg (13.2 pounds) with drycells
 - 7.8 kg (17.6 pounds) with the 6 V internal rechargeable batteries
- Operating temperature : $-20 \degree C$ to $+70 \degree C$ (-40 °C to $+70 \degree C$ with an optional screen heater)
- Storage temperature : 40 °C to + 70 °C with an optional screen heater.
- Power supply : either six 1.5 V D size alkaline dry cells or one 12 V external battery or two 6 V internal rechargeable batteries connected in series (= 12 V) or one 12 V external battery.

(the autonomy is 100 hours of operation at 20 $^{\circ}$ C with a set of new alkaline dry cells and 50 hours of operation at 20 $^{\circ}$ C with the two charged internal 6 V batteries.)

INSTRUMENT SPECIFICATIONS – GSM 19T PROTON MAGNETOMETER

The GSM-19T magnetometer system is designed and manufactured by GEM Systems Inc.

The GSM-19T system is a portable microprocessor based magnetometer system that is capable of measuring changes or contrasts in the earth's magnetic field. The data is both sensitive and highly repeatable.

The GSM-19T is a multi-purpose instrument designed to operate as either:

- 1. Total field magnetometer
- 2. Total field base station magnetometer
- 4. Gradiometer

The GSM-19T has a 0.2nT resolution, and a 1nT absolute accuracy over its full temperature range (-40 C to +60 C). The magnetic field measuring process consists of the following steps:

a) Polarization: A strong DC current is passed through the sensor creating polarization of a proton-rich fluid in the sensor.

b) Pause: The pause allows the electrical transients to die off, leaving a slowly decaying proton precession signal above the noise level.

c) Counting: The proton precession frequency is measured and converted into magnetic field units.

d) Storage: The results are stored in memory together with date, time and co-ordinates of measurement. In base station mode, only the time and total field are stored.

Synchronized operation between hand held and base station units is possible, and the corrections for diurnal variations of magnetic field are done automatically. The results of measurement are made available in serial form (RS-232-C interface) for collection by data acquisition systems, terminals or computers. Both on-line and post-operation transfers are possible.

The stored corrected data with grid lines and coordinate labels, and is then plotted as profiles or contours on the appropriate grid maps.

	Docolu	tion	0.01nT (commo) mognetic field and gradient
	Resolu		0.0 m (gamma), magnetic field and gradient
Accuracy:		acy:	0.2n1 over operating range
	Range:	:	20,000 to 120,000nT
Gradient Toler	ance:	Over 10,000nT/m	
Operating Interval:		3 seconds min	imum, faster optional. Readings initiated from
		keyboard, exte	ernal trigger, or carriage return via RS-232C.
Input/Output:		6 pin weatherp	proof connector, RS-232C, and (optional) analog
		1011 000	
Power Require	Power Requirements: 12V, 200mA peak (during polarization), 30mA standby. 30		beak (during polarization), 30mA standby. 300mA
		peak in gradio	meter mode.
Power Source: Internal 12V, 2.6Ah sealed lead-acid ba		2.6Ah sealed lead-acid battery standard, others	
		optional. An E	External 12V power source can also be used.
Battery Charger: Input: 110 VAC, 60Hz. Optional 11/2		C, 60Hz. Optional 11/220VAC, 50/60 Hz.	
		Output: dual le	evel charging.
Operating Ranges:		Temperature:	-40 C to +60 C.
		Battery Voltage: 10.0V minimum to 15V maximum.	
		Humidity: up	to 90% relative, non condensing.
Storage Tempe	erature:	-50 C to +65 C	
Display:LCD:	240 x 6	64 pixels, OR 8	x 30 characters.
Built in heater	for op	eration below -	20 C.
Dimensions:		Console: 223 :	x 69 x 240mm
		Sensor Staff: 4	1 x 450 mm sections.
		Sensor: 170 x	71mm dia.
		Weight: conso	le 2 1kg Staff 0.9 kg Sensors 1 1kg each

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APPARENT RESISTIVITY SEUDOSECTIONS : 14W 13W 12W 10W Dipole-Pole Array a = 50 m plot point a = 50 m plot point b = 500 b = 500 c = 500 b = 500 c = 5000 c = 50000 c = 50000 c = 50000 c = 500000 c = 500000000000000000000000000000000000	
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	A GEOSCIENCES LTD.

450N 500N 550N 600N 350N 400N 150N 250N 300N 100N 200N 14 4 4 14 -24 - 24 12 2 - 64 . . . 1.4 . . 1.0 . + 0 1550 m - · · 4.2 18 . . . 1500 m · · · 1450 m · · · . . 1.2 100 1400 m - · 450 N 500 N 550 N 400 N 350 N 100 N 150 N 200 N 250 N 300 N 777 Filler T interi R5 A+1 7+2 6.1 2.8 n#3 3.2 ned. n=2 59 n+5 6.1 043 N+8 mid 7.2 7.6

9.1

CHARGEABILITY PSEUDOSECTION

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n+8.

INDUCED POLARIZATION SURVEY CHARGEABILITY PSEUDOSECTION AND RECOVERED MODEL

Tx : GDD 2.8 KW Standard lime domain signed - 2s tar, 2s off, 2s-on, 2s off

Dato File : carbonate...mag...IP.gdb Operator | Induced Polarization - FD

This 2D chargeability model was generated using the UBC Geophysical Inversion Facility's DCIP2D program library.



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BRITISH C NTS DATE SURVEYED DWG # (DATE): MRX0201E AURORA GEOSO

-Pole Array <u>na</u> <u>a</u> a = 50 metres	
Filter ** * * * * * * * * * *	
of the decay curve 80,80,160,160,160,320,320,320 maec - 2s +on. 2s off, 2s-on, 2s off	
100	
NIII.6 Image: Image	
21pt.gdb 1 GEOSOFT BICRID m r : 2 passes ed Polorization - FD	
TI:2000 50 75 100 125 Thetres COM rare 50 ESOURCES LTD. GLE PROJECT 1 POINT FILTER P ZONE	
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