Assessment Report

Z-TEM Survey, Watershed Gold Property

Ontario, Canada

Sanatana Resources Inc.
1925-925 West Georgia Street
Vancouver, British Columbia, Canada
V6C 3L2

March 12, 2012

Prepared By:

Caracle Creek International Consulting Inc.
Jenna McKenzie, Hon.B.Sc., P.Geo.
Elisabeth Ronacher, Ph.D., P.Geo.

This report has been prepared by Caracle Creek International Consulting Inc. ("Caracle Creek) on behalf of Sanatana Diamonds Inc.

2012

Issued by: Sudbury Office

Office Locations

Toronto
34 King Street East, 9th Floor
Toronto, ON
Canada, M5C 2X8

Tel: +1.416.368.1801
Fax: +1.416.368.9794
Canada@caraclecreek.com

Vancouver
409 Granville Street, Suite 1409
Vancouver, BC
Canada, V6C 1T2

Tel: +1.604.637.2050
Fax: +1.604.602.9496
Canada@caraclecreek.com

Sudbury
25 Frood Road
Sudbury, ON
Canada, P3C 4Y9

Tel: +1.705.671.1801
TF: +1.866.671.1801
Fax: +1.705.671.3665
Canada@caraclecreek.com

Johannesburg
7th Floor
The Mall Offices
11 Cradock Avenue, Rosebank
South Africa

Tel: +1.27 (0) 11.880.0278
Fax: +1.27 (0) 11.447.4814
Africa@caraclecreek.com

www.caraclecreek.com

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 EXECUTIVE SUMMARY

Caracle Creek International Consulting Inc. ("Caracle Creek") of Sudbury, Ontario, Canada was contracted by Sanatana Resources Inc. ("Sanatana") of Vancouver, British Columbia, Canada, to complete an assessment report on the Z-TEM survey and structural interpretation completed on the Watershed Property.

The Watershed Gold Property consists of 46 unpatented mining claims covering 7840 hectares (ha) and is located ~165 km north of Sudbury, Ontario, at approximately UTM 425000 E and 5266322 N (NAD83, Zone 17) in Chester, Yeo, Benneweis and Neville townships. On February 14, 2011 Sanatana entered into an option agreement with Augen Gold Corp. ("Augen") to earn 51 % interest in the 46 claims that are the subject of the option agreement.

Access to the Property is via Highway 144 from Sudbury. A network of dirt roads crosses the Property. The infrastructure in the area of the Watershed Property, including access to power, water, accommodation and other services, is excellent.

The Watershed Gold Property is located in the southern part of the Swayze greenstone belt of the Western Abitibi Subprovince of the Superior Province of the Canadian Shield. The southern Swayze greenstone belt is an ESE-trending syncline that extends from Esther to Brunswick townships (Siragusa, 1993). The inner part of the syncline is composed of tholeiitic and calc-alkaline metavolcanic rocks; and the core is composed of clastic metasediments that are the youngest rocks in the structure. In Chester township felsic to intermediate intrusive rocks of the Chester Granitoid Complex separate the northern and southern limbs of the syncline (Heather and Shore, 1999). The Watershed Gold Property is underlain by the northern and the southern limb of the syncline forming the Swayze greenstone belt.

Several gold occurrences are reported from the Watershed Property (Mineral Deposit Inventory, Ontario Ministry of Northern Development, Mines and Forestry).

A significant amount of historic exploration was completed on the Watershed Property including grab sampling, geophysical surveys, and diamond drilling. The geophysical surveys delineated several anomalies, the diamond drilling intersected zones of moderate mineralization and the grab sampling returned gold assays of up to 270 g/t Au (McRoberts, 2010a).

Sanatana has not completed any exploration on the Watershed Property as of the effective date of this Report.

2.0 Introduction and Terms of Reference

2.1 Introduction

Caracle Creek International Consulting Inc. ("Caracle Creek") of Sudbury, Ontario, Canada was contracted by Sanatana Resources Inc. ("Sanatana") of Vancouver, British Columbia, Canada, to complete an assessment report on the Z-TEM survey and structural interpretation completed on the Watershed Property.

This Report is based on a Z-TEM survey completed by Geotech Ltd. on the Watershed Property from April 4 to 19, 2011 and on a structural interpretation base on the Z-TEM survey.

2.2 Caracle Creek Qualifications

Caracle Creek International Consulting Inc. is an international consulting company with the head office of Canadian operations based in Sudbury, Ontario, Canada. Caracle Creek provides a wide range of geological and geophysical services to the mineral industry. With offices in Canada (Sudbury and Toronto, Ontario and Vancouver, British Columbia) and South Africa (Johannesburg), Caracle Creek is well positioned to service its international client base.

Caracle Creek's mandate is to provide professional geological and geophysical services to the mineral exploration and development industry at competitive rates and without compromise. Caracle Creek's professionals have international experience in a variety of disciplines with services that include:

- Exploration Project Generation, Design and Management
- Data Compilation and Exploration Target Generation
- Property Evaluation and Due Diligence Studies
- Independent Technical Reports (43-101)/Competent Person Reports
- Mineral Resource/Reserve Modelling, Estimation, Audit; Conditional Simulation

- 3D Geological Modelling, Visualization and Database Management

In addition, CCIC has access to the most current software for data management, interpretation and viewing, manipulation and target generation.

The author of this Report is Ms. Jenna McKenzie, Hon. B.Sc., P.Geo. Ms. McKenzie, Geophysicist for Caracle Creek Canada, is a geoscientist in good standing with the Association of Professional Geoscientists of Ontario (APGO #1653). Ms. McKenzie has worked since 2001 as a geophysicist in the mining industry on a variety of exploration properties such as diamond-bearing kimberlite, potash, lithium, gold and Ni-Cu-PGE. Ms. McKenzie has co-authored or contributed to several Independent Technical Reports (NI 43-101). Ms. McKenzie did not visit the Property and is jointly responsible for the entire Report.

A co-author of this Report is Elisabeth Ronacher, PhD., P.Geo. Dr. Ronacher is a Senior Geologist for CCIC and a geologist in good standing with the Association of Professional Geoscientists of Ontario (APGO #1476). She has 10 years of experience in the mineral exploration industry and in academia and has authored/co-authored Independent Technical Reports (NI43-101).

Certificate of Qualifications of the Qualified Person is provided in Appendix 1.

3.0 PROPERTY DESCRIPTION AND LOCATION

3.1 Location

The Watershed Gold Property is located ~165 km north Sudbury, Ontario and ~130 km south of Timmins, Ontario at approximately 425000 E and 5266322 N, UTM Zone17 N NAD83 (Figure 3-1). The town of Gogama is approximately 26 km northeast of the Property. The Property is covered by NTS map sheets 41P12SW and 41O9SE.

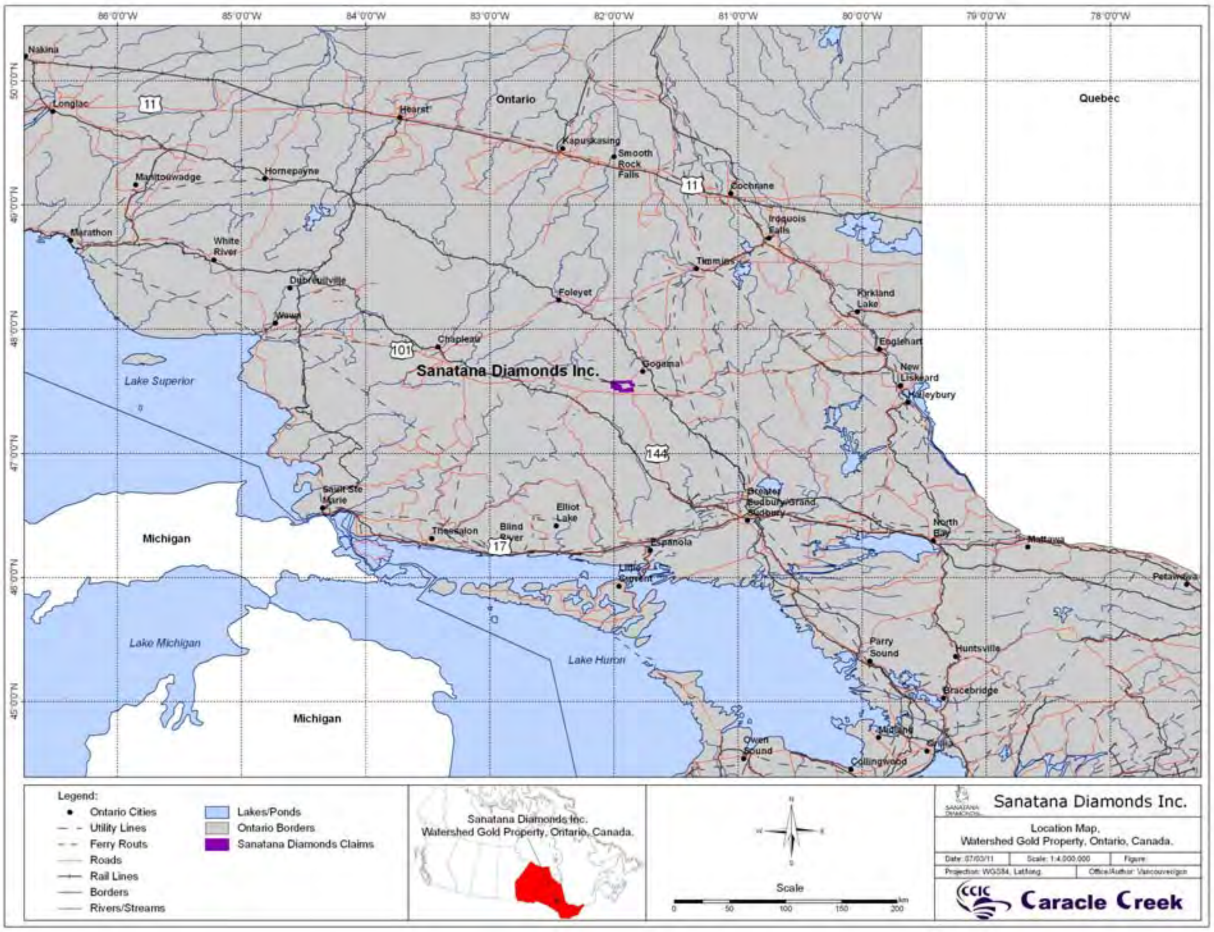


Figure 3-1: Location of the Watershed Property, Ontario.

3.2 Property Description and Ownership

The Watershed Gold Property consists of 46 contiguous, unpatented claims comprising 7840 ha in the Porcupine Mining Division. Table 3-1 contains the list of all claims and the information about them. All claims on the Property are owned by Augen Gold Corp. On February 14, 2011 Augen Gold Corp. entered into an option and joint venture agreement with Sanatana (Sanatana Diamonds Inc. News Release, February 16, 2011). The agreement is awaiting final approval from the TSX Venture Exchange. According to the News Release, Sanatana is granted the option to acquire up to 51 % undivided interest in the 46 mineral claims listed in Table 3-1 and the right of first refusal to acquire further nine mineral claims that are owned by Augen Gold Corp. but that are not the subject of this Report. The agreement stipulates that Sanatana can earn 50 % interest in the claims by:

1. paying to Augen $150,000 within 10 days of the regulatory approval of the agreement
2. issuing to Augen 2,000,000 shares within10 days of the regulatory approval of the agreement
3. issuing to Augen 1,500,000 shares on or before the first anniversary of the regulatory approval of the agreement
4. issuing to Augen further 1,500,000 shares on or before the second anniversary of the regulatory approval of the agreement
5. making exploration expenditures of $1,000,000 on or before the first anniversary of the regulatory approval of the agreement
6. making further exploration expenditures of $1,500,000 on or before the first anniversary of the regulatory approval of the agreement
7. making further exploration expenditures of $2,500,000 on or before the third anniversary of the regulatory approval of the agreement

Should Sanatana complete and deliver to Augen a pre-feasibility study on or before the fifth anniversary of the regulatory approval of the agreement, Sanatana will have the right to earn one additional percent interest.

The surface rights are held by the Crown.

Table 3-1: Claim status, Watershed Gold Property.

Claim Number	Claim holder	Township/Area	Claim Due Date	Units	Area (ha)
4209355	Augen Gold Corp. (100%)	Benneweis	2013-Feb-23	12	192
4216686	Augen Gold Corp. (100%)	Benneweis	2012-Dec-04	1	16
3004844	Augen Gold Corp. (100%)	Chester	2012-May-22	5	80
3010239	Augen Gold Corp. (100%)	Chester	2012-May-26	5	80
3011820	Augen Gold Corp. (100%)	Chester	2013-Jan-20	1	16
3011854	Augen Gold Corp. (100%)	Chester	2013-Jan-26	1	16
3014374	Augen Gold Corp. (100%)	Chester	2012-Nov-19	8	128
3017665	Augen Gold Corp. (100%)	Chester	2013-Feb-25	3	48
3017666	Augen Gold Corp. (100%)	Chester	2013-Feb-25	3	48
3017667	Augen Gold Corp. (100%)	Chester	2013-Feb-25	3	48
3017668	Augen Gold Corp. (100%)	Chester	2013-Feb-25	6	96
3018410	Augen Gold Corp. (100%)	Chester	2013-May-26	12	192
3018411	Augen Gold Corp. (100%)	Chester	2013-May-26	12	192
3018412	Augen Gold Corp. (100%)	Chester	2012-Apr-18	1	16
3018437	Augen Gold Corp. (100%)	Chester	2013-May-26	16	256

3019033	Augen Gold Corp. (100%)	Chester	2013-May-26	2	32
4203263	Augen Gold Corp. (100%)	Chester	2012-May-22	1	16
4203267	Augen Gold Corp. (100%)	Chester	2012-Dec-25	12	192
4203839	Augen Gold Corp. (100%)	Chester	2012-Sep-21	6	96
4203852	Augen Gold Corp. (100%)	Chester	2012-Sep-21	15	240
4206270	Augen Gold Corp. (100%)	Chester	2012-Sep-21	12	192
4206271	Augen Gold Corp. (100%)	Chester	2012-Sep-21	16	256
4206272	Augen Gold Corp. (100%)	Chester	2012-Sep-21	16	256
4206273	Augen Gold Corp. (100%)	Chester	2012-Sep-21	16	256
4206276	Augen Gold Corp. (100%)	Chester	2012-Sep-21	12	192
4206277	Augen Gold Corp. (100%)	Chester	2012-Sep-21	16	256
4206278	Augen Gold Corp. (100%)	Chester	2012-Sep-21	16	256
4206279	Augen Gold Corp. (100%)	Chester	2012-Sep-21	16	256
4227171	Augen Gold Corp. (100%)	Chester	2012-Oct-22	5	80
4240907[1]	Augen Gold Corp. (100%)	Chester	2012-Jul-22	13	208
4240908	Augen Gold Corp. (100%)	Chester	2012-Jul-22	12	192
4219670	Augen Gold Corp. (100%)	Neville	2013-Jan-15	3	48
3017383	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	16	256
3017384	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	16	256
3017670	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	10	160
3017671	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	16	256
3017672	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	10	160
3017673	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	16	256
3017674	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	16	256
3018463	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	16	256
3018541	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	16	256
3019553	Augen Gold Corp. (100%)	Yeo	2013-Mar-17	16	256
3019555	Augen Gold Corp. (100%)	Yeo	2013-Mar-17	16	256
3019556	Augen Gold Corp. (100%)	Yeo	2012-Mar-17	16	256
4203293	Augen Gold Corp. (100%)	Yeo	2012-May-22	16	256
4203294	Augen Gold Corp. (100%)	Yeo	2012-May-22	16	256
TOTAL					**7840**

[1]Claim 4240907 is subject to the following alienation: "Flooding to contour 1200 feet reserved to Ontario Hydro location HY34, L.O.7643 File 10621".

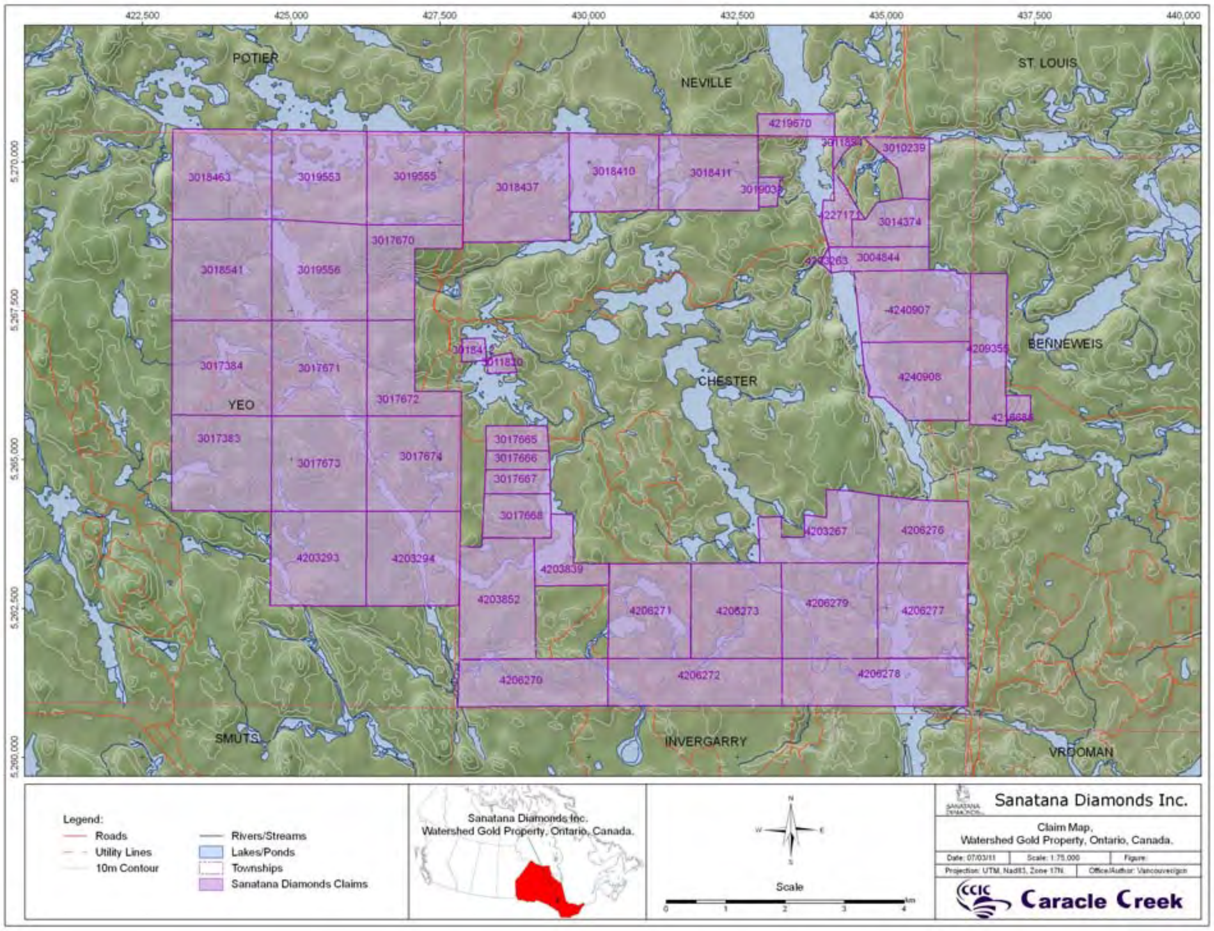


Figure 3-2: Claim map showing the extent of the Watershed Property.

4.0 Accessibility, Climate, Local Resources, Infrastructure, and Physiography

4.1 Access

The Watershed Gold Property can be accessed on Highway 144 from Sudbury and Timmins, Ontario (Figure 3-1) and from the Sultan gravel Road which begins at the intersection of Highway 144 and Highway 560 (the so called "watershed"). Several dirt roads heading west from Highway 144 and dirt roads heading north from Sultan Road can be used to access the Property. Some of the dirt roads are ploughed during the winter and can therefore be used year-round.

4.2 Climate, Vegetation and Physiography

Timmins is the closest weather station to the Watershed Gold Property. The coldest average temperatures are -17.5 in December and the warmest average temperature is 17.4 in July. The average precipitation is approximately 85 cm and falls evenly throughout the year (http://www.climate.weatheroffice.gc.ca). Exploration can be completed year-round, however, drilling on marsh lands and swamps is restricted to the winter months when the ground is frozen.

The Watershed Gold Property is covered by extensive tree cover composed of spruce, balsam, poplar, jack pine, tamarack and birch, which is typical of Ontario's Boreal forest.

The area is characterized by moderate relief with an average elevation of ~400 m above sea level. The area contains a significant amount of marshy land, lakes and rivers. The watershed follows the Sultan Road: north of the road the drainage is to the north.

4.3 Infrastructure and Local Resources

The Watershed Gold Property is located halfway between the Timmins and Sudbury mining camps, along Highway 144, therefore skilled and unskilled labour is readily available.

Gogama is located ~15 km north of the Property and is the closest population centre to the Watershed Gold Property. The approximate population of the community of Gogama is 450 people (http://www.gogama.ca). Gogama provides basic services including accommodation, restaurants, grocery stores, a nursing station, a bank and a post office.

Water is readily available from rivers and lakes. The biggest lakes include the Three Ducks Lake and the Benneweis Lake.

A major power line runs parallel to Highway 144. Another new power line crosses the Property in an east west direction. This power line was constructed to service the recent exploration and mining development in the area. The Canadian National Railway runs just west of the Property (Figure 3-1).

The surface rights are owned by the Crown.

5.0 PROPERTY HISTORY

Table 5-1 is a summary of exploration activity on Sanatana's Watershed Gold Property in chronological order.

Table 5-1 History of exploration activity for Sanatana's Watershed Gold Property

Year	Company	Type of Work	Results	Assessment File Number
1950	W. Hurst and M. Arnott	line cutting, surveying, geological mapping	geological map, best assay 0.13 oz/ton	41O09SE0063
1958	Three Ducks Lake Syndicate	diamond drilling	no significant results	41P12SW0091
1961	Jonsmith Mines Ltd.	diamond drilling	no significant results	41P12SW0100
1970	Renmark Explorations	EM survey	identified 4 conductors	41P12SW0116
1971	Wm. R. Miller	diamond drilling	no significant results	41P12SW0098
1979	Cominco Ltd.	line cutting, geological mapping, sampling, magnetics	magnetics identified anomalies, best assay 0.22 g/t Au	41P12SW0136
1979	Wm. Sims Industries Ltd.	airborne magnetics, prospecting, sampling	2 showings sampled, best assay 0.59 oz/ton	41P12SW0019
1980	Neals Andersen, Jack McVittie, Harvey Blanchard, Baxter Minerals Ltd. and Canadian Crest Gold Mines Ltd.	geophysics, stripping, mapping, sampling	best assay 3-9 % Cu	41P12SW0083
1980	Cominco Ltd.	magnetics, EM	long conductive feature	41O09SE0058
1980	Cominco Ltd.	diamond drilling	best sample 0.26 g/t Au over 1.5 m	41O09SE0059
1980	Cominco Ltd.	geological mapping	geological map	41O09SE0061
1980	Hanson Mineral Exploration Ltd.	claim option, summary of exploration	0.262 oz/t Au over 18.1 ft	41P12SW0084
1980	Hargor Resources INC.	airborne EM	major E-W conductor and a fault	41O09NW9161
1980	Wm. Sims Industries Ltd.	magnetics, EM	numerous conductive zones	41P12SW0018
1981	Murgold Resources Inc.	geological mapping	no significant results	41P12SW0004
1981	Murgold Resources Inc.	VLF-EM survey	2 anomalies	41P12SW0071
1981	National Irron Resources Ltd.	geological mapping	no significant results within property	41P12SW0017
1981/82	Hanson Mineral Exploration Ltd.	diamond drilling	no significant results	41P12SW0079
1983	Kidd Creek Mines Ltd.	magnetics, EM	a highly conductive, nonmagnetic zone was identified	41O09SE0057
1983	Murgold Resources Inc.	general report	bulk sample assayed 0.34 oz/t Au	41P12SW0002
1983	Murgold Resources Inc.	trenching, sampling, mapping, drilling	no significant results within property	

Year	Company	Type of Work	Results	Assessment File Number
1983/84	Kidd Creek Mines Ltd.	diamond drilling	best intersection 5.2 g/t Ag, 0.22% Cu, 0.764% Zn over 1.5 m	41P12SW0134
1985	Blue Falcon Mines Ltd.	airborne magnetic and VLF-EM	identified several conductors	41P12SE0507
1985	Kidd Resources Ltd./Blue Falcon Mines Ltd.	magnetics, EM	located 9 conductors	41P12SW0066
1985	Kidd Resources Ltd.	VLF EM survey, magnetics	5 conductors and a high magnetic band was identified	41P12SW0132
1985	Nu-Start Resources Corp.	diamond drilling	best intersection 0.027 oz/t Au over 4.1 ft	41P12SW0063
1986	Blue Falcon Mines Ltd.	airborne magnetic and VLF-EM	identified several conductors	41912SW8506
1986	Blue Falcon Mines Ltd.	magnetics, VLF-EM, geological survey	4 conductors and a magnetic high area	41P12SW0130
1987	Blue Falcon Mines Ltd. & Kidd Resources Ltd.	geological mapping, sampling, magnetics	identified minor sulphide bearing shear zones	41P12SW0300
1987	Consolidated Silver Butte Mines Ltd.	geological mapping, geochemistry, VLF-EM	located 6 conductors, best assay 0.33 oz/t Au	41P12SW0038
1987	Consolidated Silver Butte Mines Ltd.	soil sampling, VLF-EM	located 10 Au targets	41P12SW0039
1987	Consolidated Silver Butte Mines Ltd.	geological mapping, geochemistry, VLF-EM	located 4 conductors, best assay 0.754 g/t Au	41P12SW0055
1986	Consolidated Silver Butte Mines Ltd.	geological mapping, geochemistry	no significant results	41P12SW0060
1987	Isaac Burns	diamond drilling	no significant results	41P12SW0053
1988	Consolidated Silver Butte Mines Ltd.	VLF-EM, soil sampling	located 6 conductors	41P12SW0122
1987	Consolidated Silver Butte Mines Ltd.	stripping	no significant results	41P12SW0131
1988	Consolidated Silver Butte Mines Ltd.	general report	no significant results	41P12NE8451
1989	Blue Falcon Mines Ltd.	stripping	no significant results	41P12SW0123
1989	Blue Falcon Mines Ltd.	stripping	no significant results	41P12SW0127
1989	Consolidated Silver Butte Mines Ltd.	geochemistry	best assay 0.468 oz/t Au	41P12SW0027
1986-1988	Consolidated Silver Butte Mines Ltd.	geochemical sampling and assaying	best assay 0.543 oz/ton Au	41P12SW0028
1989	Consolidated Silver Butte Mines Ltd.	geological mapping, sampling	best assay 0.754 oz/t Au	41P12SW8456
1990	Blue Falcon Mines Ltd.	airborne magnetic and VLF-EM	located several conductors	41P12SE0520
1992	Edwin L. Speelman	VLF-EM survey	identified 3 conductors	41P12SW0026
1992	Edwin L. Speelman	geochemistry, sampling	no significant results	41P12SW8455

Year	Company	Type of Work	Results	Assessment File Number
1993	Angelo Tomasini	diamond drilling	best intersection 0.131 oz/t Au over 5 m	41P12SW0008
1994	Edwin L. Speelman	stripping, trenching, diamond drilling	best intersection 2.94 g/t Au over 1.9 m	41P12SW0013
1995	Henry Douglas	IP survey	located 1 chargeable, conductor	41P12SW0014
1995	R. Bruce Durham & Robert Duess (Individuals)	stripping, sampling, IP survey	best assay 1.392 g/t Au, one anomaly	41P12SW0016
1998	Erana Mines Ltd.	trenching, stripping, sampling	best assay 2.23 oz/t Au	41P12SW0033
2009	Augen Gold Corp	sampling, diamond drilling, airborne magnetic and EM survey	best assay 270 g/t A; geophysics delineated several anomalies	Internal company reports

5.1 Hurst and Arnott

Between May and August 1950, W. Hurst and M. Arnott performed line cutting, surveying and geological mapping (MNDMF Assessment File 41O09SE0063; on Sanatana's claim 3018463) southwest of Schist Lake in the Yeo township. The mapping was carried out by W. Gerrie. There are four showings on the map area hosted in mineralized shear zones and mineralized veins in iron formation. The mineralization consists of disseminated pyrite, pyrrhotite and arsenopyrite. The best sample yielded 0.13 oz/ton (4.46 g/t) Au and appeared to be spatially associated with arsenopyrite.

5.2 Three Ducks Lake Syndicate

In August, 1958 Three Ducks Lake Syndicate drilled on hole totaling 177 feet (53.95 m) south of the east arm of Bagsverd Lake in Chester township (Sanatana's claim3018411; MNDMF Assessment File 41P12SW0091). The exact location is not known. No gold was reported.

5.3 Jonsmith Mines Ltd.

In April, 1961 Jonsmith Mines Ltd. drilled 1 drill hole totaling 101 feet (30.78 m) in Chester township (MNDMF Assessment File 41P12SW0100). The hole intersected some sulphide, but no gold was reported.

5.4 Renmark Explorations

In 1970 Renmark Exploration conducted an electromagnetic survey southwest of Mesomikenda Lake in Chester township (MNDMF Assessment File 41P12SW0116). The survey identified 4 significant conductors that are located along the contact between granite and sediments.

5.5 Wm. R. Miller

In September, 1971, Wm. R. Miller drilled 1 hole totaling 150 feet northeast of Southcamp Bay in Chester township (Sanatana's 4227171 claim) (MNDMF Assessment File 41P12SW0098). The hole intersected granodiorite with minor amounts of quartz veins and pyrite, but no assays were reported.

5.6 Wm. Sims Industries Ltd.

In July, 1979 Wm. Sims Industries Ltd. carried out an airborne magnetometer survey, prospecting and sampling in the northeast corner of Chester and northwest corner of Benneweis townships (MNDMF Assessment File 41P12SW0019). The work was performed by Edward J. Blanchard. The spacing of the airborne magnetometer survey lines was 660 feet (201 m) and the altitude of the aircraft was 250 feet 76 m). The targets indicated by the airborne survey were sampled. Gold was found in mostly east-west striking veins and shear zones. The best showing is located between Southcamp Bay and Hwy 144 in Chester township (No.1 showing). The best assay from the No.1 showing returned 0.48 oz/ton (16.45 g/t) Au. The best sample returned 0.59 oz/ton (20.23 g/t) of Au over 3.5 feet (1.07) across a vein from a shaft (No.4 showing).

In July and August 1980, Wm. Sims Industries Ltd. carried out magnetic and electromagnetic surveys and prospecting in the northeast corner of Chester and northwest corner of Benneweis townships (MNDMF Assessment File 41P12SW0018). The work was performed by Shield Geophysics Ltd. There are 2 showings on the property: No.1 (Eccles-Holmes) showing and the No.4 showing. Assays of grab samples from the No.1 occurrence returned between 0.01 and 0.08 oz/ton (2.74 g/t) Au. The geophysical surveys (400 feet spacing) suggested the presence of numerous conductive zones that were believed to represent shear zones. According to the report, the strongest conductive zones may represent sulphides.

5.7 Cominco Ltd.

In August and September 1979, Cominco Ltd. completed line cutting, geological mapping, a magnetometer survey and sampling in the Schist Lake area (MNDMF Assessment File 41P12SW0136).

The magnetometer survey identified strong anomalies which coincided with diabase dikes and some anomalies trending east-west, which is the general direction of the stratigraphy and structure in the area. Grab samples were collected; the best sample returned 0.22 g/t Au.

In September and October 1979, Cominco Ltd. completed geological mapping southwest of Schist Lake (MNDMF Assessment File 41O09SE0061). Two previously trenched showings containing sulphide were identified. Both showings occur in iron formation. No assays were reported.

In October 1979, Cominco Ltd. completed a horizontal loop EM and magnetics survey southwest of Schist Lake (MNDMF Assessment File 41O09SE0058). The work was performed by Geoex Ltd. The survey delineated a long conductive feature, which was identified as iron formation by geological mapping. According to the report, a sinistral fault and a vertical displace the iron formation by approximately 500 feet (152.4 m).

In April and May 1980, Cominco Ltd. drilled 3 holes totaling 249.33 m southwest of Schist Lake (Sanatana's claim 3018463; MNDMF Assessment File 41O09SE0059). The drill holes intersected mafic and felsic volcanic rocks and iron formation. The best sample returned 0.26 g/t Au over 1.5 m. Another sample returned 1508 ppm Zn over 1.5 m. Both samples were iron formation.

5.8 Hargor Resources Inc.

In August, 1980 Hargor Resources Inc. carried out an electromagnetic survey in Yeo, Huffman, Grove and Osman townships (MNDMF Assessment File 41O09NW9161). The survey was performed by Geophysical Surveys Inc. The lines were oriented north-south and located 200 m apart. A major east-west trending conductor and a fault in Yeo township were delineated by the survey.

5.9 Neals Andersen, Jack McVittie, Harvey Blanchard, Baxter Minerals Ltd. and Canadian Crest Gold Mines Ltd.

Between August 1979 and October 1980, an airborne magnetometer survey, gamma-ray spectrometer survey, bulldozing, stripping and sampling of sulphide zones were carried out on a group of claims owned by Neals Andersen, Jack McVittie, Harvey Blanchard, Baxter Minerals Ltd. and Canadian Crest Gold Mines Ltd. in the northwest corner of Chester and northeast corner of Yeo townships (MNDMF Assessment File 41P12SW0083). The work was performed by Erana Mines Ltd. The line spacing was 660 feet (201 m). A vein was sampled and the analyses averaged 3-9 % Cu; the presence of gold was reported but not quantified.

5.10 Hanson Mineral Exploration

In November 1980, Hanson Mineral Exploration reported a summary of the geology of their property in Chester township (MNDMF Assessment File 41P12SW0084). A vein was sampled and yielded an average of 0.262 oz/t (8.98 g/t) over 18.1 feet (5.52 m). One sample yielded 3.3 oz/t (113.14 g/t) Ag over 3.9 feet (1.19 m).

Between September 1981 and May 1982, Hanson Mineral Exploration drilled two drill holes totalling 212.2 feet (61.63 m) in Chester township (MNDMF Assessment File 41P12SW0079). One of the drill holes intersected a shear zone, but no gold was found in the samples.

5.11 Murgold Resources Inc.

Between May and September 1981, Murgold Resources Inc. completed geological mapping in Chester, Benneweis and St. Louis townships (MNDMF Assessment File 41P12SW0004). The work was performed by Norminex Ltd. Several gold bearing veins were identified. A grab sample from a vein (#16) yielded Au 2.9 oz/t (99.43 g/t), but that is located outside of the Watershed Gold Property.

Between May and August 1981, Murgold Resources Inc. carried out a VLF-EM survey (MNDMF Assessment File 41P12SW0071). The work was performed by Norminex Ltd. The survey identified two anomalous zones that were interpreted to represent fractures parallel to that of gold-bearing quartz veins in the area.

In 1983 Murgold Resources Inc. completed a general report on their property in Chester, Benneweis and St. Louis townships (MNDMF Assessment File 41P12SW0002). The work was performed by Hill, Goettler, De Laporte Ltd. The weighted average of a 656 ton bulk sample taken during an earlier exploration program yielded 0.34 oz/t (11.66 g/t) Au.

Following the report, in the summer and fall of 1983, Murgold Resources carried out an exploration program consisting of diamond drilling, trenching, sampling, soil sampling, geological mapping and VLF-EM and magnetometer surveys. Several gold-bearing veins and shear zone were identified, the exact location of them is not known and most of them fall outside of the Watershed Gold Property. Approximately 32 drill holes were drilled, but the exact locations of the holes are not known.

5.12 National Irron Resources Ltd.

In August and September 1981, National Irron Resources Ltd. completed geological mapping on their property in Benneweis township (MNDMF Assessment File 41P12SW0017). One area of interest was located southwest of Annex Lake, which is located outside of the Watershed Gold Property boundaries.

5.13 Kidd Creek Mines Ltd.

In May and June 1982, Kidd Creek Mines Ltd. carried out a proton precession magnetometer, a horizontal loop electromagnetic and a VLF electromagnetic survey in Yeo township (MNDMF Assessment File 41O09SE0057). A single, highly conductive, nonmagnetic zone was detected; the exact location is not known.

Between September 1983 and June 1984, Kidd Creek Mines Ltd. drilled 3 holes totalling 2906 feet (885.75 m) in Yeo township (MNDMF Assessment File 41P12SW0134). The drill holes intersected sulphide and gold mineralization. Samples were assayed for Cu, Zn Au and Ag, but the units were not reported.

5.14 Blue Falcon Mines Ltd.

In June and July 1985, Blue Falcon Mines Ltd. conducted an airborne magnetic and a VLF electromagnetic survey (MNDMF Assessment Files 41P12SE0507 and 41P12SW8506). The work was performed by Terraquest Ltd. The survey covered 15 townships including the Yeo, Chester, Benneweis and Neville townships. The data were useful in identifying a number of conductors that may indicate the presence of sulphides.

In August and September 1986, Blue Falcon Mines Ltd. carried out a magnetic, a VLF electromagnetic survey and a geological survey southwest of Moore Lake in Yeo township (MNDMF Assessment File 41P12SW0130). The VLF electromagnetic survey located 4 significant conductors occurring in granites. The magnetic survey identified a magnetic high area within the granites, possibly indicating the presence of sulphides.

In October 1989, Blue Falcon Mines Ltd. completed stripping in Yeo township (MNDMF Assessment Files 41P12SW0123 and 41P12SW0127). No significant results were reported.

In December 1990, Blue Falcon Mines Ltd. contracted Terraquest to complete a high sensitivity magnetic and VLF-EM survey on their properties across Mallard, Yeo, Chester, Benneweis and Champagne townships (MNDMF Assessment File 41P12SE0520). The magnetic data acquired was found to be consistent with known geology. The EM data identified numerous conductors, some of which can be correlated to know structures.

5.15 Kidd Resources Inc.

In March 1985, Kidd Resources Inc. and Blue Falcon Mines Ltd. carried out a magnetometer VLF electromagnetic survey in the southeastern part of Chester township (MNDMF Assessment File 41P12SW0066). The work was performed by Bobex Exploration Ltd. The survey located nine moderate to strong electromagnetic conductors trending WNW-ESE.

In March 1985, Kidd Resources Inc. completed line cutting and magnetometer and VLF electromagnetic surveys west of Moore Lake in Yeo township (MNDMF Assessment File 41P12SW0132). The work was performed by Bobex Exploration Ltd. The VLF electromagnetic survey identified 5 weak to strong conductors and the magnetic survey identified a high magnetic band with a strike similar to that of the regional trend.

In May 1987, Kidd Resources Inc. and Blue Falcon Mines Ltd. completed line cutting and geological mapping in east central Yeo and west central Chester townships (MNDMF Assessment File 41P12SW0300). Shear zones with sulphides were identified.

5.16 Nu-Start Resources Corporation

In July, 1985 Nu-Start Resources Corporation completed a drilling program consisting of 3 drill holes totaling 1318 feet (401.73 m) west of Bagsverd Lake in Chester township (MNDMF Assessment File 41P12SW0063). The holes intersected veins with minor sulphide mineralization. The best intersection assayed 0.027 oz/t (0.93 g/t) Au over 4.1 feet (1.25 m).

5.17 Consolidated Silver Butte Mines Ltd.

Between July 1986 and August 1988, Consolidated Silver Butte Mines Ltd. carried out geochemical assaying on rock grab samples west of Mesomikenda Lake in Chester township (partly covered by Sanatana's claim 3019033) and Yeo township (MNDMF Assessment File 41P12SW0028). The exact location of the samples is not known. The highest amount of gold assayed was 0.543 oz/ton (18.62 g/t) Au from the northern part of Chester township, but this sample may not be located within the Watershed Gold Property.

In October and November 1986, Consolidated Silver Butte Mines Ltd. completed a geological and geochemical survey northwest of Dividing Lake (Sanatana's claim 4203267) in Chester township (MNDMF Assessment File 41P12SW0060). The work failed to locate any areas of interest for gold mineralization.

In July and August 1987, Consolidated Silver Butte Mines Ltd. carried out a VLF electromagnetic survey and a geochemical survey east of and along Southcamp Bay (Sanatana's 4240907, 4203263 and 3004844 claims) in Chester township (MNDMF Assessment File 41P12SW0039). The geophysical survey identified 24 weak to strong conductors. The geochemical survey consisted of soil sampling. The maximum values in soil samples were 0.169 g/t Au and 4.8 g/t Ag. The program was successful in locating 10 targets.

In August and September 1987, Consolidated Silver Butte Mines Ltd. carried out geological, geochemical and VLF electromagnetic surveys northwest of Dividing Lake (Sanatana's claim 4203267) in Chester township (MNDMF Assessment File 41P12SW0055). The geochemical survey consisted of soil and rock chip sampling. The richest soil sample returned 0.044 g/t Au. The best rock chip sample yielded 0.754 g/t Au. The VLF electromagnetic survey identified three strong conductors and one weak conductor.

In October and November 1987, Consolidated Silver Butte Mines Ltd. completed line cutting and geological, geochemical and geophysical surveys west of Mesomikenda Lake in Chester township (partly covered by Sanatana's claim 3019033; MNDMF Assessment File 41P12SW0038). The geochemical survey consisted of soil sampling and 6 rock chip samples. The highest gold value was 0.03 g/t Au in the soil samples. The assays of rock chip samples yielded a maximum value of 0.33 oz/t (11.31 g/t) Au, but this sample falls outside of the Watershed Gold Property. The geophysical survey consisted of a VLF electromagnetic survey, which was successful in locating 6 moderate to strong conductors.

In November 1987, Consolidated Silver Butte Mines Ltd. carried out a VLF electromagnetic survey and soil sampling between Moore Lake and Schist Lake in Yeo township (Sanatana's claims 3018463 and 3019553; MNDMF Assessment File 41P12SW0122). The VLF electromagnetic survey was successful in locating 6 conductors, although the shear zones hosting Au did not give a strong response due to the disseminated nature of sulphides in them. The best soil sample yielded 0.04 g/t Au.

In December 1987, Consolidated Silver Butte Mines Ltd. completed bulldozer stripping on their properties in Chester and Yeo townships (MNDMF Assessment File 41P12SW0131).

In April 1988, Consolidated Silver Butte Mines Ltd. filed an assessment report that summarized the exploration programs on all of their properties in the southern Swayze greenstone belt including the properties in Chester and Yeo townships (MNDMF Assessment File 41P12NE8451). The report also proposed an exploration program for 1988 and 1989, which included stripping, blasting, diamond drilling and geological mapping in the Chester and Yeo township.

In June 1989, Consolidated Silver Butte Mines Ltd. completed geological mapping and sampling east of and along Southcamp Bay (Sanatana's claims 4240907, 4203263 and 3004844) in Chester township (MNDMF Assessment File 41P12SW8456). The mapping identified several veins and shear zones of interest. A grab sample yielded 0.754 oz/t (25.85 g/t) Au.

In August, 1989 Consolidated Silver Butte Mines Ltd. reported assay data on grab samples (MNDMF Assessment File 41P12SW0027). The sample with the highest amount of gold yielded 0.468 oz/t (16.05 g/t) Au. This sample was collected east of Southcamp Bay in Chester township (Sanatana's claim 4240907).

5.18 Isaac Burns

In February 1987, Isaac Burns completed a drilling program consisting of 3 holes totaling 870 feet (265.18 m). The holes were drilled on the western shore of Clam Lake (MNDMF Assessment File 41P12SW0053). The holes intersected primarily granodiorite with minor mafic units, some weak pyrite was noted by no assays were reported.

5.19 Edwin L. Speelman, James A. Bryan, Frederick W. Chubb, Murray Little.

In 1992, Edwin L. Speelman, James A. Bryan, Frederick W. Chubb, and Murray Little conducted a VLF – EM 16 survey in the Chester Lake area of their Bryan et al. property within Chester Township (MNDMF Assessment File 41P12SW0026). The survey identified 18 conductors, 15 of which are classified as poor with the remaining 3 conductors being intermediate to moderate conductors. Some conductors were interpreted to be potential shear zones.

In 1992, Edwin L. Speelman, James A. Bryan, Frederick W. Chubb, and Murray Little conducted a boulder and humus sampling program in the Chester Lake area of their Bryan et al. property within Chester Township (MNDMF Assessment File 41P12SW8455). Seven humus samples were taken, all of which assayed less than 3 ppb Au. The highest gold value reported from the boulder samples as 50 ppb Au.

In 1994, Edwin L. Speelman, James A. Bryan, Frederick W. Chubb, and Murray Little completed a stripping/trenching and drilling program in the Chester Lake area of their Bryan et al. property within Chester Township (MNDMF Assessment File 41P12SW0013). A total of 10 holes were drilled on the property. Hole DD93-3 discovered a new copper showing in the upper portion of the hole with hole DD93-10 having an anomalous drill intersection of 2940 ppb Au over 1.9 m. Drilling also identified numerous shear and fracture zones across the drilled areas. Trenching identified a number of shear zones with quartz veins. One anomalous grab sample of 803 ppb Au was taken. A gold particle/panning study was also conducted by professor Mike Milner. Twenty four till samples were panned with the highest number of gold particles being observed being 16.

5.20 Angelo Tomasini

In 1993, Angelo Tomasini contracted R.J. Roussain (Consultant) to complete diamond drilling in an area close to highway 144, on the east side of Mesomikenda Lake (MNDMF Assessment File 41P12SW0008). Six holes were drilled totaling 1115 feet (339.85 m) to test mineralized quartz veins as well as a parallel VLF conductor. The best intersection found was 0.131 oz/t (4.49 g/t) Au over 5 m in hole 93-04. However, anomalous gold was found throughout holes intersecting mineralized quartz veins.

5.21 Henry Douglas

In 1995, Henry Douglas contracted Rayan Exploration Ltd. to conduct an IP survey on his Benneweis township property located in west and southwest Benneweis township (MNDMF Assessment File 41P12SW0014). The survey was intended to identify a proposed fault within the area. Of the three lines surveyed, all indicate a chargeable, conductive body to the east, which was interpreted to indicate the possible fault zone.

5.22 Robert Duess and Bruce Durham

In 1995, Robert Duess and Bruce Durham acquired staked claims around the Bagsverd lake area and completed a regional prospecting/sampling/line cutting program as well as an IP survey (MNDF Assessment File 41P12SW0016). Twenty six grab samples were collected during the course of the program with one sample assaying at 1.392 g/t Au. Val d'Or Geophysics was contracted to complete an

IP survey. Results of the survey indicated the presence of several high chargeability/low resistivity anomalies.

5.23 Erana Mines Limited

In 1998, Erana Mines Limited completed a stripping and sampling program on their property close to highway 144, on the east side of Mesomikenda Lake (MNDNF Assessment File 41P12SW0033). Four trenches were dug and a strongly fractured zone within a granodiorite body with quartz and chalcopyrite was identified. One chip sample from this zone assayed at 2.23 oz/t (76.46 g/t) Au with other samples as high as 0.132 oz/t (4.53 g/t) Au and 0.125 oz/t (4.29 g/t)Au.

5.24 Augen Gold Corp.

5.24.1 South Swayze Property

In October and November 2007, Fugro Airborne Surveys Corp. completed an airborne magnetic and EM survey for Augen Gold Corp. ("Augen") on Augen's South Swayze property which included the current Sanatana Watershed Property. The information was used to produce maps that display magnetic, conductive and radiometric properties of the survey.

The EM anomalies fall into four general categories. The first type consists of discrete, well-defined anomalies, which are usually attributed to conductive sulphides or graphite, but could also represent near vertical faults or shears. The second type consists of moderately broad responses that are flat-dipping and may represent conductive rock units, zones of deep weathering or alteration zones. The third type of anomaly includes anomalies associated with magnetite. The fourth type of anomaly represents cultural anomalies. The EM survey identified more than 500 weak to strong bedrock conductors over the survey area.

The magnetic contour maps display variations in magnetic intensity, irregular patterns and offsets or changes in strike directions, suggesting that the survey area has undergone intense deformation and/or alteration. The magnetic survey also identified numerous, narrow, dyke-like features and faults striking NNW and at least four NE-trending features in the east central portion of the Augen property.

The survey identified at least five conductors within or near Schist Lake, one of them is a strong east-trending, NE dipping conductor, located near the southern edge of a magnetic unit. Two other anomalies within Schist Lake suggest a thin bedrock source associated with an ESE-trending magnetic anomaly. The survey also identified a SSE-trending low resistivity zone along Southcamp Bay. No further details of the survey were available to CCIC.

5.24.2 Chester Gold Area

During a regional prospecting program in 2009, Augen confirmed several historic gold occurrences in the southern part of their South Swayze property called Chester Gold Area (McRoberts, 2010a). Grab samples from the Chester Gold occurrence in the Chester Gold Area returned 270.0, 133.0, 69.3, 57.9 and 35.0 g\t Au (Figure 8-1).

In the same year, Augen completed diamond drilling on the Chester Gold Area. Four drill holes were completed in October of 2009 totalling 299.5 meters (Table 5-2; McRoberts, 2010a). Drilling was carried out to test the potential beneath the historic Chester Gold Occurrence, where grab samples yielded up to 270 g/t Au. The best intersection of the drilling was in hole CG09-06 which was 0.413 g/t Au over 0.3 meters (Table 5-3). Drilling failed to identify significant gold mineralization underlying the historic gold occurrence in the Chester Gold Area.

Table 5-2 Drill collar information for Augen Gold Corporation's 2009 drill program, Chester Gold area.

Hole #	Claim Number	Easting	Northing	Azimuth (°)	Dip (°)	Depth (m)	Completion Date
CG09-05	3017665	429060	5265401	204	-45	86.0	Oct-19-2009
CG09-06	3017665	429059	5265339	332	-45	61.0	Oct-19-2009
CG09-07	3017665	429099	5265341	292	-45	100.5	Oct-21-2009
CG09-08	3017665	429026	5265363	98	-45	52.0	Oct-21-2009
TOTAL						299.5	

Table 5-3 Drill highlights from Augen Gold Corporation's 2009 drill program, Chester Gold area

Hole #	From (m)	To (m)	Length (m)	Sample Number	Au (g/t)
CG09-05	64.40	65.00	0.60	H821374	0.044
CG09-06	36.00	36.30	0.30	H821415	0.413
CG09-07	59.23	59.50	0.27	E429143	0.058
CG09-08	41.48	41.60	0.12	E429122	0.10

5.24.3 Schist Lake Area

Augen Gold Corp completed a regional prospecting program in the Schist Lake Area of their South Swayze Property in 2009 (McRoberts, 2010b). Highlights from the sampling of occurrences within the Schist Lake West Area included: 1.89 g\t Au, 1.97 g\t Au (Cryderman Pit Occurrence), 2.81 g\t Au, 1.17 g\t Au (Moore Lake\Bobway Occurrence) and 7.16 g\t Au, 6.38 g\t Au, 6.28 g\t Au (trenches and shaft near Schist Lake).

In 2009, Augen Gold Corporation completed diamond drilling on the Schist Lake Area. Five drill holes were completed in October of 2009 totalling 627.5 meters (Table 5-4; McRoberts, 2010b). Drilling was intended to test four historic gold occurrences (Cryderman pit occurrence, Moore Lake/Bobway occurrence, historic trenches and mine shaft near Schist Lake) within the Schist Lake West Area. The best intersection of the drill program was in hole SC09-01 at 0.769 g/t Au over 1.12 meters (Table 5-5; true widths of mineralization in these drill holes, at this stage, is not precisely known). Drilling failed to identify significant gold mineralization underlying the historic gold occurrences in the Schist Lake Area.

Table 5-4: Drill collar information for Augen Gold Corporation's 2009 drill program, Schist Lake area.

Hole #	Claim Number	Easting	Northing	Azimuth (°)	Dip (°)	Depth (m)	Completion Date
SC09-01	3019553	424971	5269442	179	-45	169.0	Oct-12-2009
SC09-02A	3019553	425035	5269340	179	-45	33.0	Oct-08-2009
SC09-02B	3019553	425039	5269349	197	-45	123.0	Oct-10-2009
SC09-03	3019553	426086	5269202	179	-45	142.5	Oct-14-2009
SC09-04	3019555	426965	5269797	169	-45	160.0	Oct-16-2009
TOTAL						**627.5**	

Table 5-5: Drill highlights from Augen Gold Corporation's 2009 drill program, Schist Lake area.

Hole #	From (m)	To (m)	Width (m)	Sample Number	Au (g/t)
SC09-01	48.55	49.67	1.12	H821223	0.769
SC09-02B	26.00	27.00	1.00	H821004	0.078
SC09-02B	34.51	35.19	0.68	H821015	0.155
SC09-03	81.00	81.43	0.57	H821067	0.240
SC09-04	45.39	46.44	1.05	H821199	0.243
SC09-04	74.00	75.00	1.00	H821076	0.147
SC09-04	75.00	75.75	0.75	H821077	0.445

The true widths of the mineralization in historic drill holes are not known.

6.0 GEOLOGICAL SETTING

6.1 Regional Geology

The Watershed Gold Property lies within the Swayze Greenstone Belt, which is part of the Western Abitibi Subprovince of the Superior Province. The age of the Abitibi Subprovince is between 2.75 and 2.67 Ga (Jackson and Fyon, 1991; Figure 6-1).

Figure 6-1: Location of the Abitibi subprovince. (from Jackson and Fyon, 1991).

The Western Abitibi Subprovince is bounded by the Kapuskasing Structural Zone to the west, the sedimentary rocks of the Opatica Subprovince to the north, the sedimentary rocks of the Pontiac Subprovince and the Mesoproterozoic Grenville Province to the southeast and the Paleoproterozoic Huronian Supergroup to the south (Jackson and Fyon, 1991; Ayer et al., 2005).

The rocks in the Western Abitibi Subprovince can be subdivided into (Jackson and Fyon, 1991):

1. komatiite-tholeiite assemblages with interflow iron formation
2. komatiite-tholeiite assemblages with felsic metavolcanic rocks
3. komatiite-tholeiite assemblages with no significant iron formation or felsic metavolcanic rocks
4. tholeiite assemblages characterized by alternating iron- and magnesium-rich units
5. tholeiite assemblages characterized by thick iron- or magnesium-rich units, or both
6. ultramafic to felsic metavolcanic rocks with iron formation
7. intermediate to felsic metavolcanic rocks
8. intermediate effusive metavolcanic rocks
9. turbiditic metasedimentary dominated rocks
10. alluvial-fluvial metasedimentary and alkalic metavolcanic dominated rocks

Pre-cleavage folds, thrust faults and structures related to batholith emplacement are the oldest structure in the Western Abitibi Subprovince (Jackson and Fyon, 1991). This is followed by the development of regional shear zones and folds during and following the emplacement of batholiths and striking west to northwest and northeast. Thrust faults and steep reverse faults accompanied the shearing and folding.

The types of mineralization in the Western Abitibi Subprovince include: VMS (volcanic-associated massive sulphide) deposits, lode gold deposits, komatiite-associated Ni-Cu-PGE deposits and iron formations.

The Western Abitibi Subprovince contains the following domains: the Abitibi greenstone belt (including the Swayze greenstone belt); the Batchawana greenstone belt; the Benny, Hutton and Parkin greenstone belts and the Temagami greenstone belt (Jackson and Fyon, 1991).

The Abitibi greenstone belt is one of largest and economically most productive greenstone belts in the world (Ayer and Trowell, 2002). The Abitibi greenstone belt is subdivided into a northern belt and a southern belt (Jackson and Fyon, 1991; Dimroth et al., 1983b). The northern belt is characterized by abundant tonalite-trondhjemite-granodiorite intrusions, large anorthosite complexes, lack of ultramafic flows and greenschist or higher grade of metamorphism. The southern belt consists of abundant ultramafic flows, fewer tonalite-trondhjemite-granodiorite intrusions and greenschist or lower grade of metamorphism.

6.2 Local Geology – Swayze Greenstone Belt

6.2.1 General Geology

The Watershed Gold Property is located within the southern Swayze greenstone belt (Figure 6-2, which is located in the southern Abitibi greenstone belt and is interpreted to represent a deeper erosional level of the Abitibi greenstone belt (Heather et al., 1995; Ayer and Trowell, 2002). The southern Swayze greenstone belt is an ESE-trending syncline that extends from Esther to Brunswick townships (Siragusa, 1993). The outer limb of the syncline is composed of tholeiitic flows of greenschist facies. The inner part of the syncline is composed of tholeiitic and calc-alkaline metavolcanic rocks; and the core is composed of clastic metasediments that are the youngest rocks in the structure. The metasediments in the west part of the belt are intruded by the Jerome porphyry. Iron formation and subvolcanic gabbroic rocks are also present in the southern Swayze greenstone belt.

In Chester township felsic to intermediate intrusive rocks of the Chester Granitoid Complex separate the northern and southern limbs of the syncline (Heather and Shore, 1999). The northern part of this pluton is the host of several gold occurrences. In the southeastern part of Yeo township a more mafic component of the Chester Granitoid Complex merges with the southern limb of the syncline. The contact between the mafic and felsic to intermediate intrusive rocks forms an S-shaped migmatitic fringe in Chester township (Siragusa, 1993). The contact zone between the northern limb of the syncline and the granitic pluton in Chester township is also migmatitic.

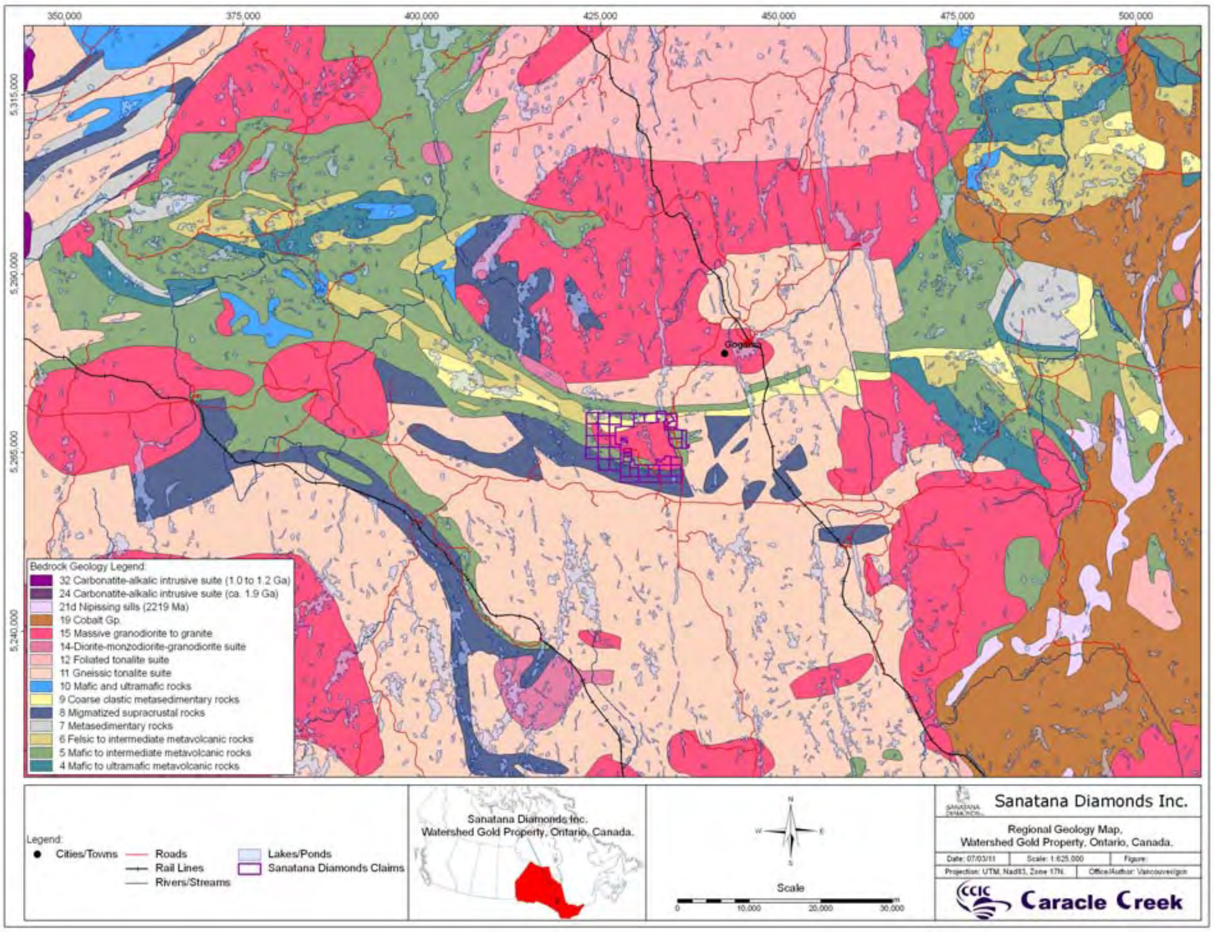


Figure 6-2: Regional geology map showing the location of the Watershed Gold Property in the Swayze greenstone belt.

6.2.2 Deformation and metamorphism

The Swayze greenstone belt has undergone polyphase folding, development of multiple foliation generations, high-strain zones and late brittle faulting (Heather and Shore, 1999).

Eight major subparallel, sinistral NNW-trending and several NE-trending faults offset the syncline (Siragusa, 1993). Younger diabase dikes also strike NNW and NE to a lesser extent.

Most of the rocks in the Swayze greenstone belt have undergone greenschist facies metamorphism (Heather and Shore, 1999). Amphibolite facies metamorphism is limited to the contact aureoles of felsic intrusions.

6.2.3 Alteration

The rocks in the Swayze greenstone belt were subjected to two types of synvolcanic alteration, syntectonic and late tectonic alterations (Heather and Shore, 1999).

The first type of synvolcanic alteration is characterized by intense chloritization (±sericitization) and is associated with felsic to intermediate volcanic activity around 2730 Ma (Heather and Shore, 1999). Base metal mineralization is associated with this alteration.

The second type of synvolcanic alteration is characterized by chlorite-magnetite-epidote±sericite±quartz and is locally developed within the Chester Granitoid Complex (Heather and Shore, 1999).

Syntectonic alteration is developed in high-strain zones and includes chloritization, sericitization, silicification, Fe- and Ca-carbonatization, sulphidation and tourmalinization (Heather and Shore, 1999).

Late tectonic alteration is associated with brittle faults and fractures and is characterized by the presence of alteration minerals chlorite, epidote, hematite and quartz (Heather and Shore, 1999).

6.2.4 Mineralization in the Swayze Greenstone Belt

Base metals and gold are the main commodities in the Swayze greenstone belt (Heather and Shore, 1999).

Most of the base metal occurrences are associated with iron formation (Heather and Shore, 1999). There are two types of base metal mineralization in iron formation: chlorite-quartz-chalcopyrite±sphalerite±galena breccia zones and minor amounts of stratiform/stratabound pyrite-pyrrhotite±sphalerite. Base metals are also associated with gold occurrences in the Chester Granitoid Complex. Minor chalcopyrite-pyrite mineralization occurs in some of the granitoid complexes. Most of the gold mineralization is associated with quartz veins (Heather and Shore, 1999).

The presence of mineralization in the Swayze greenstone belt in general does not necessarily indicated the presence of mineralization on the Watershed Property. This Report distinguishes clearly between the mineralization in the region and the mineralization on the Watershed Property.

6.3 Property Geology

The Watershed Gold Property is underlain by the northern and the southern limb of the syncline forming the Swayze greenstone belt. The eastern part and southeastern corner of the felsic pluton of the Chester

Granitoid Complex underlies the Chester, Yeo and Benneweis townships and hosts several gold occurrences mostly to the north of the Property boundary; and mafic intrusive rocks of the Chester Granitoid Complex surrounding the felsic pluton (Figure 6-3).

The Watershed Gold Property can be subdivided into the Schist Lake area located in the Yeo township and the Chester area located in the Chester township, in the southern part of the Neville township and western part of the Benneweis township. The northern Chester area is located north of the Chester Granitoid Complex and the southern Chester area is located south of the felsic pluton of the Chester Granitoid Complex.

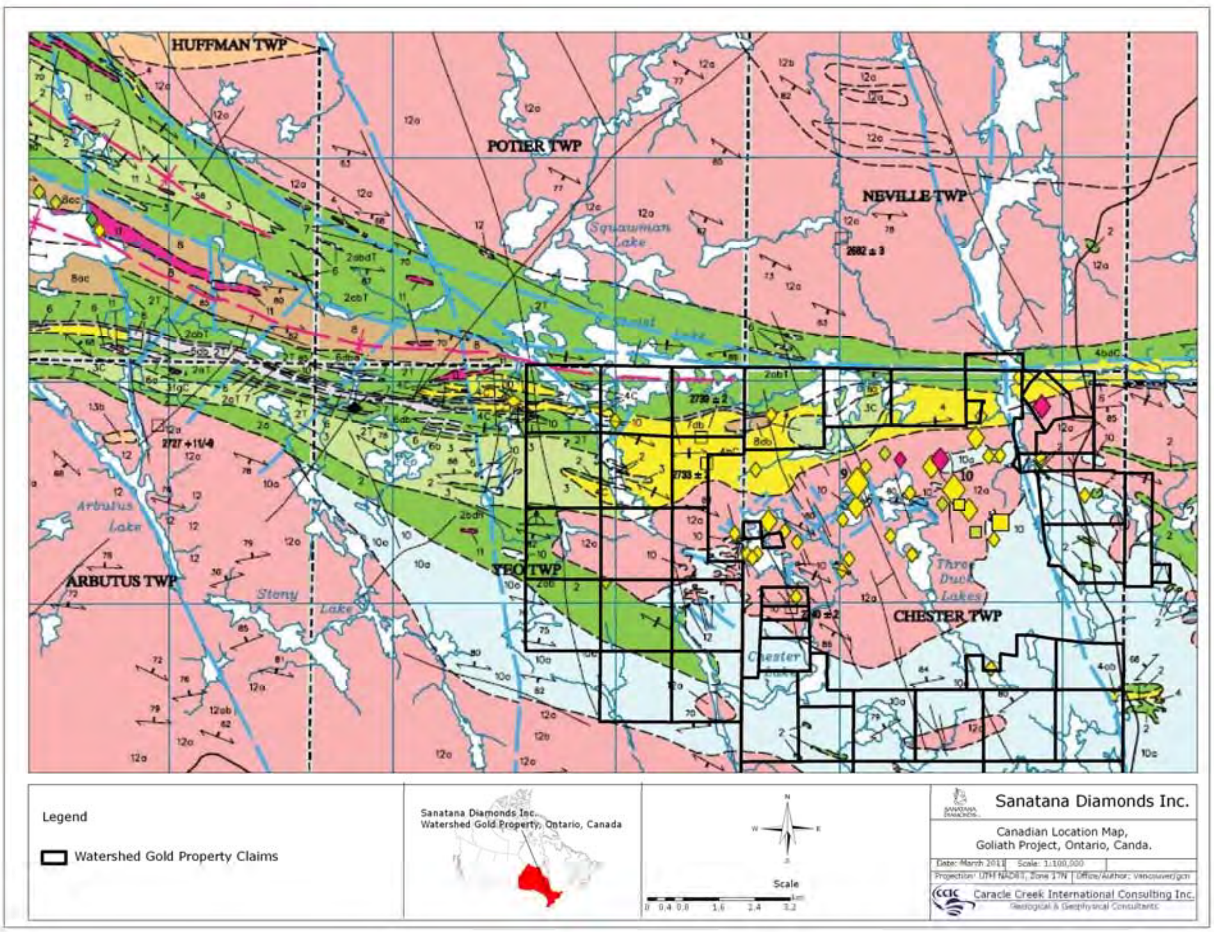


Figure 6-3: Property geology map (from Ayer and Trowell, 2002).

ARCHEAN

NEOARCHEAN

13 Alkalic Intrusive Suite
- 13a Syenite, monzonite, granite
- 13b Diorite, syenodiorite, monzogabbro, hornblendite
- 13c Schistose-textured

12 Felsic to Intermediate Intrusive Suite
- 12a Tonalite, granodiorite, trondhjemite
- 12b Granite, quartz monzodiorite, quartz diorite
- 12c Schistose-textured

11 Porphyry Suite
- 11a Porphyry
- 11b Quartz and/or feldspar porphyry
- 11d Tonalite, granodiorite

10 Mafic Intrusive Rocks
- 10a Diorite, gabbro, melagabbro
- 10b Porphyritic
- 10c Anorthositic gabbro, leucogabbro
- 10d Granophyre

9 Ultramafic Intrusive Rocks
- 9a Peridotite, pyroxenite
- 9c Schistose-textured

INTRUSIVE CONTACT

8 Timiskaming-Type Clastic Metasedimentary Rocks
- 8a Arenite
- 8b Wacke
- 8c Conglomerate
- 8d Mudstone, siltstone
- 8e Schistose-textured

UNCONFORMITY

7 (or) Chemical Metasedimentary Rocks
- 7a Iron formation
- 7b Oxide facies
- 7c Sulphide facies
- 7d Silicate facies, chert
- 7e Graphite facies

6 Clastic Metasedimentary Rocks
- 6a Arenite
- 6b Wacke
- 6c Conglomerate
- 6d Mudstone, siltstone
- 6f Schistose-textured

5 Alkalic to Calc-Alkalic Metavolcanic Rocks/Intrusions
- 5a Massive flows
- 5b Porphyritic flows
- 5c Tuff
- 5d Breccia, pyroclastic breccia

4 Felsic (to Intermediate) Metavolcanic Rocks/Intrusions
- 4a Massive flows
- 4b Tuff, lapilli tuff
- 4c Tuff breccia, pyroclastic breccia
- 4d Porphyritic
- 4e Spherulitic
- 4f Schistose-textured
- 4C Calc-alkalic
- 4T Tholeiite

3 Intermediate (to Felsic) Metavolcanic Rocks/Intrusions
- 3a Massive flows
- 3b Pillowed flows
- 3c Variolitic flows
- 3d Hyaloclastite, flow breccia
- 3e Amygdaloidal flows
- 3f Tuff, lapilli tuff
- 3g Tuff breccia, pyroclastic breccia
- 3h Schistose-textured
- 3C Calc-alkalic
- 3T Tholeiite

2 Mafic (to Intermediate) Metavolcanic Rocks/Intrusions
- 2a Massive flows
- 2b Pillowed flows
- 2c Variolitic flows
- 2d Hyaloclastite, flow breccia
- 2e Amygdaloidal flows
- 2f Tuff, lapilli tuff
- 2g Tuff breccia, pyroclastic breccia
- 2h Schistose-textured
- 2C Calc-alkalic
- 2F High-iron tholeiite
- 2M High-magnesium tholeiite
- 2T Tholeiite

1 Ultramafic (to Mafic) Metavolcanic Rocks/Intrusions
- 1a Massive flows/intrusions
- 1b Polysutured flows
- 1c Spinifex-textured flows
- 1d Pillowed flows
- 1f Schistose-textured
- 1B Basaltic komatiite
- 1K Komatiite
- 1O Olivine-spinifex

[a] This is a compilation legend.
[b] Units preceded by "G" are based on interpretation from aeromagnetic maps, those preceded by "D" are based on drilling information.
[c] Rocks are subdivided lithologically and the order does not imply age relationships within or among groups.

Figure 6-3 continued: Legend

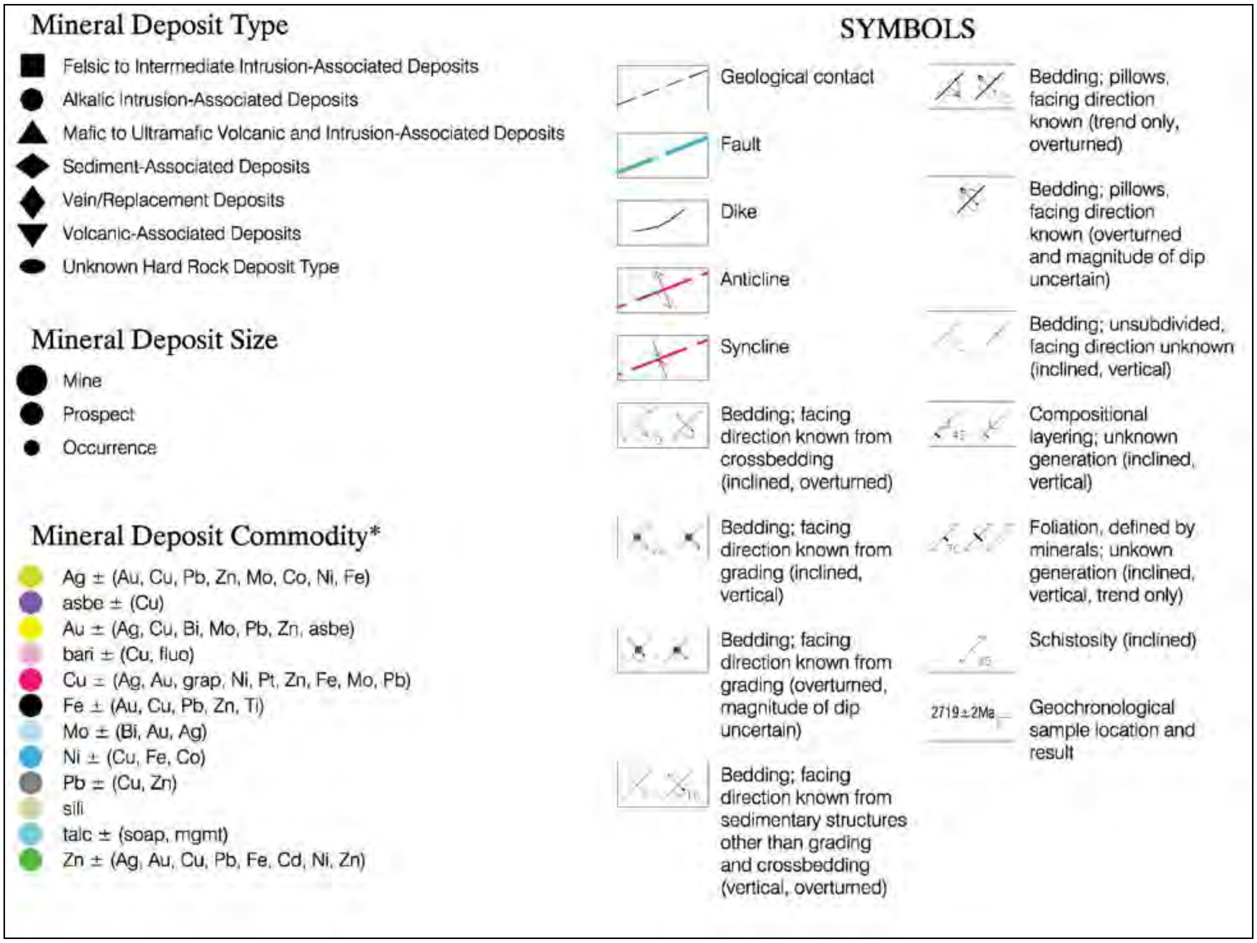


Figure 6-3 continued: Legend

6.3.1 Schist Lake area

The oldest rocks in the Schist Lake area are the felsic and intermediate intrusive rocks of the west part of Chester Granitoid Complex that separates the northern and southern limbs of the Swayze syncline (Heather and Shore, 1999).

In Yeo township, west of Schist Lake there is a major NNW striking fault marked by Moore Lake and Mollie River, which offsets the rocks considerably (Heather and Shore, 1999). The northern limb of the syncline east of the fault consists of an east-west striking volcanic succession composed of a wide band of felsic and intermediate volcanic units (Chester Group) and a wide band of pillowed mafic volcanic unit (October Lake Formation). In the felsic unit there is a narrow discontinuous band of iron formation near the contact with the mafic unit.

West of the fault there is a similar, but younger succession of felsic volcanic units and iron formation (Marion Group; Heather and Shore, 1999). West of the fault, along Moore Lake, mafic flows of unknown relative age and intermediate calc-alkaline volcanic rocks of the Chester Group are abundant (Heather and Shore, 1999).

The southern limb of the syncline is composed of mafic volcanic rocks of the Arbutus Formation and mafic intrusive rocks of the Chester Granitoid Complex (Heather and Shore, 1999).

6.3.2 Chester area

The southern part of the Chester area is underlain by mafic intrusive rocks and the southwestern corner of the felsic intrusive rocks of the Chester Granitoid Complex (Heather and Shore, 1999). Felsic to intermediate intrusive rocks of the Smuts Pluton are located under the southwestern corner of the Chester area. Minor amounts of mafic and felsic volcanic rocks occur at the eastern border of the southern part of the Chester area.

The northern part of the Chester area is located north of the Chester Granitoid Complex and is underlain by the northern limb of the Swayze syncline. A major NNW-trending fault marked by Southcamp Bay and Mesomikenda Lake offsets the rocks in the northern Chester area (Heather and Shore, 1999; Ayer and Trowell, 2002).

East of the fault the Property is underlain by the felsic to mafic intrusive rocks of the Chester Granitoid Complex and the northern limb of the syncline, which is composed of the felsic volcanic rocks of the Chester group and mafic volcanic rocks of the October Lake Formation, similar to the rocks east of the fault (Heather and Shore, 1999). The northern limb of the syncline becomes narrower to the east.

West of the fault the northern limb of the Swayze syncline is similar in composition to the Schist Lake area east of the NNW-striking fault marked by Moore Lake and Mollie River (Heather and Shore, 1999) and consists of east-west trending felsic volcanic succession with iron formation of the Chester Group bounded by mafic volcanic rocks of the October Lake Formation. Similar to the Schist Lake area, most but not all of the iron formation, is located near the contact with the mafic volcanic rocks. Intermediate volcanic rocks of the Chester Group are located within the felsic volcanic succession just north of the Chester Granitoid Complex.

7.0 DEPOSIT TYPE

7.1 Orogenic Deposits

The Swayze greenstone belt is prospective for orogenic gold deposit ("shear zone hosted", "mesothermal", "greenstone-hosted quartz-carbonate vein" deposit; Figure 7-1). These deposits occur in deformed greenstone belts, particularly those that are characterized by tholeiitic basalts and ultramafic komatiites intruded by intermediate to felsic porphyritic intrusions (Dubé and Gosselin, 2007). They are located along major compressional to transtensional crustal-scale fault zones marking convergent margins between major units but ore is typically hosted by second- and third order shears and faults and at jogs and changes in strike (Goldfarb et al., 2005). In Canada, these vein deposits are often associated with conglomerates (e.g. the Timiskaming conglomerate). They are a major source of gold in the greenstone belts of the Superior and Slave provinces of the Canadian Shield.

Orogenic gold deposits are characterized by a network of auriferous, laminated quartz-carbonate veins and locally hydrothermal breccias. The dominant sulfides are pyrite and arsenopyrite but W-, Bi- and Te-bearing phases are also common. Sulfides also occur disseminated in the wall rock. Typical alteration includes iron-carbonate, silicification, muscovite, chlorite, K-feldspar, biotite, tourmaline and albite.

Orogenic deposits formed from metamorphic fluids (Dubé and Gosselin, 2007) that were rich in CO_2, low in salinity and generated during prograde metamorphism where the fluids were channelled along major crustal deformation zones. Drastic pressure changes (and resulting unmixing and desulfidation) and wall rock interaction caused the precipitation of the sulfides (and gold).

World-class ore bodies are between 2 and 10 km long, approximately 1 km wide and extend to depths of 2 to 3 km (Goldfarb et al., 2005). Canadian examples include the Timmins, Kirkland Lake, Val d'Or and Rouyn-Noranda districts of the Abitibi greenstone belt and the Pickle Lake and Rice Lake greenstone belts of the Uchi subprovince (Figure 7-2).

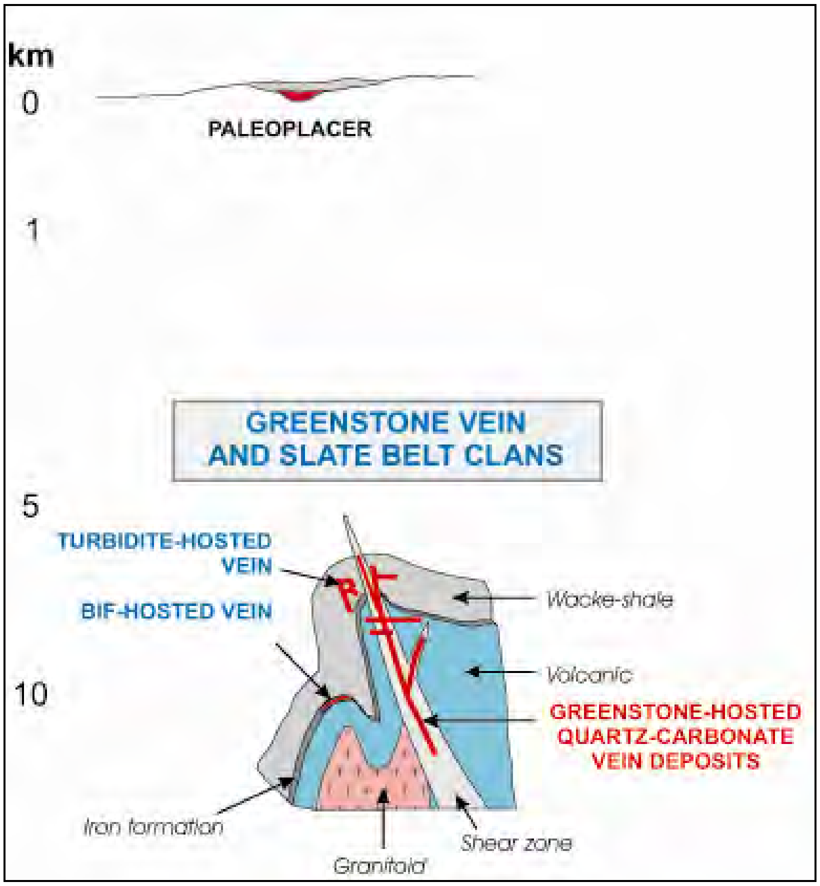


Figure 7-1: Schematic presentation of the geological environment and crustal depth of orogenic gold deposits (from Dubé and Gosselin, 2007).

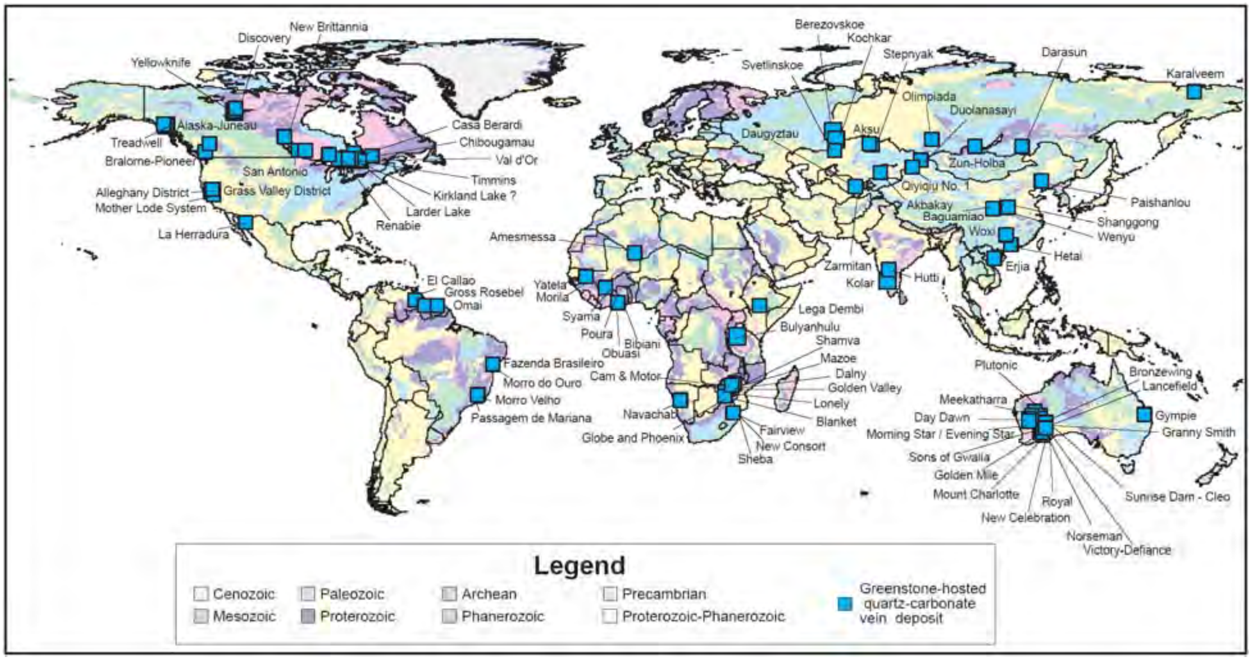


Figure 7-2: Examples of orogenic gold deposits world-wide (from Dubé and Gosselin, 2007).

8.0 MINERALIZATION

The data source for all occurrences is the Mineral Deposit Inventory ("MDI") of the MNDMF (http://www.mndmf.gov.on.ca/mines/ogs_earth_e.asp). Therefore, the exact length, width, depth and continuity of the mineralization are not known.

8.1 Cryderman-Moore Lake Occurrence

The Cryderman-Moore Lake occurrence (MNDMF MDI: MDI41P12SW00138) is located in the Schist Lake area in Yeo township (Table 8-1; Figure 8-1).

Gold is hosted in quartz veins occurring in shear zones in diorite. The shear zones are close to and sub-parallel to the contact between metasedimentary rocks and massive diorite. Shears are up to 4 m thick and parallel to the axial plane of large scale folds. The alteration is confined to the shear zones and is characterized by Fe-carbonate, serpentine, tourmaline and chlorite. Other minerals include pyrite, chalcopyrite and tourmaline. One grab sample collected in 1987 (Consolidated Silver Butte Mines) returned 17 g/t Au value. Grab samples collected by the Ontario Geological Survey (OGS) in 1994 returned values up to 4.22 g/t Au and 2.5 g/t Ag.

8.2 Silver Butte Occurrence

The Silver Butte occurrence (MNDMF MDI: MDI41P12SW00139) is located in the Schist Lake area close to the Cryderman-Moore Lake occurrence (Table 8-1; Figure 8-1).

Gold is hosted in discontinuous, narrow quartz-carbonate veins and stringers in a shear zone located at the contact between diorite and an epiclastic schistose rock to the north. The minerals in the vein include quartz, carbonate, sericite, tourmaline and pyrite. One grab sample collected in 1987 (Consolidated Silver Butte Mines) returned 0.5 g/t Au. A grab sample collected by the Ontario Geological Survey (OGS) in 1994 returned 0.01 g/t Au and 0.1 g/t Ag.

Table 8-1 List of occurrences on the Watershed Gold Property

Number	Occurrence name	Commodity	Easting	Northing	Year	Host rock	Alteration
1	Cryderman-Moore Lake	Au	425006	5269301	1932	diorite	carbonate, serpentine, tourmaline, chlorite
2	Silver Butte	Au	425301	5269163	1988	diorite and metasediments	quartz, carbonate
3	Moore Lake	Au	426127	5269187	1910	diorite and metasediments	quartz, carbonate, sericite
4	Young, C.T.	Au, Cu	426965	5269765	1932	mafic volcanics	carbonate, quartz, sericite, albite, amphibole
5	Corbett-McCambly	Au	428510	5269424	1984	metasediments and felsic porphyry	quartz, sericite, carbonate, hematite
6	Kidd DDH 34-5	Ag, Cu, Zn	424780	5265663	2000	mafic and felsic metavolcanics	carbonate, actinolite, quartz, biotite, chlorite
7	Chester Gold	Au	429044	5265343	1933	felsic intrusive rocks	quartz, pyrite
8	Eccles-Holmes #4 vein	Au, Bi, Cu	435523	5267599	1933	felsic intrusive rocks	chlorite, carbonate, quartz, sericite
9	Eccles-Holmes #1 vein	Au, Bi, Mo, Ag, Cu	434538	5268448	1933	felsic intrusive rocks	quartz, carbonate, sericite, chlorite
10	Miller DDH 1-71	Mo	434211	5268645	1972	granodiorite	quartz

8.3 Moore Lake Occurrence

The Moore Lake occurrence (MNDMF MDI: MDI41O09SE00006) is located in a shaft in the Schist Lake area east of the Silver Butte occurrence (Table 8-1).

Gold is hosted in quartz-carbonate-sericite veins in a shear zone located along the contact between diorite and schistose epiclastic sediments. Pyrite, ilmenite and chlorite also occur in the veins. The alteration in the diorite and metasedimentary rocks includes saussuritization and carbonatization. A sample collected in 1979 (Erana Mines) returned 24 g/t Au.

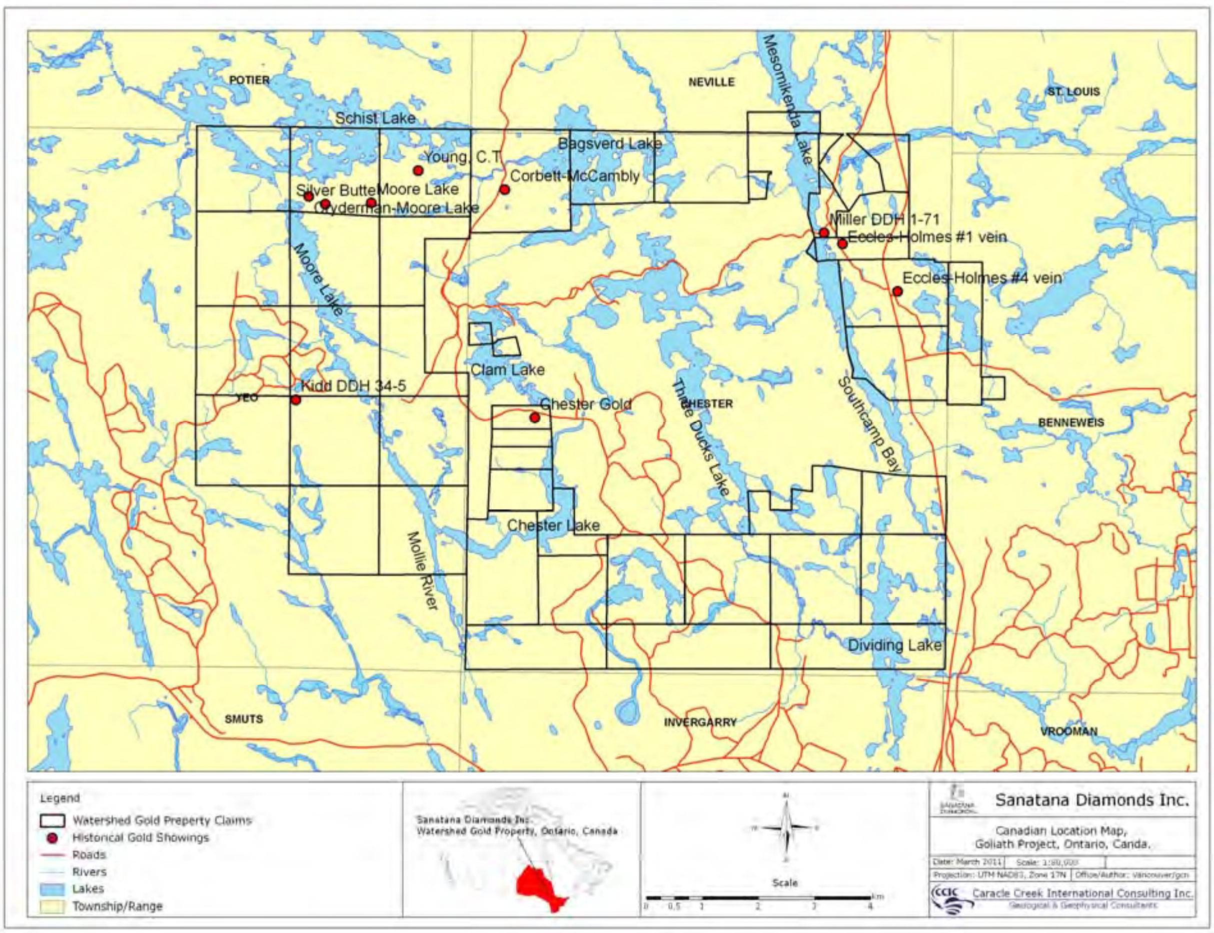


Figure 8-1: Map showing the locations of mineral occurrences on the Watershed Property. Data from the Mineral Deposit Inventory, MNDNF.

8.4 Young C.T. Occurrence

The Young, C.T. occurrence (MNDMF MDI: MDI41P12SW00047) is located in a shaft in the Schist Lake area east of the Moore Lake occurrence (Table 8-1; Figure 8-1).

The gold is hosted in a carbonatized shear zone located in mafic volcanic rocks parallel to the contact between the mafic volcanics and a feldspar-quartz porphyritic granite. Quartz veins and disseminated pyrite and chalcopyrite also occur in the shear zone. The alteration minerals include carbonate, quartz, sericite, albite and amphibole. No assays are reported.

8.5 Corbett-Mc Cambly Occurrence

The Corbett-McCambly occurrence (MNDMF MDI: MDI41P12SW00018) is located in the northern Chester area of the Watershed Gold Property east of the Young, C.T. occurrence (Table 8-1; Figure 8-1).

Gold is hosted in a quartz vein located in a shear zone between the contact of metasedimentary rocks and quartz-feldspar porphyritic rocks. The alteration minerals include quartz, sericite, carbonate and hematite. Some disseminated pyrite also occurs in the veins and in the shear zone. Grab samples collected in 1934 by Corbett McCambly returned values around 3 g/t Au. Grab samples collected by the OGS in 1994 returned values up to 0.64 g/t Au and 0.1 g/t Ag.

8.6 Kidd DDH 34-5 Occurrence

The Kidd DDH 34-5 occurrence (MNDMF MDI: MDI41P12SW00140) was found in a drill hole by Kidd Creek in 2000 and is located in the Schist Lake area, south of Moore Lake in the southern limb of the Swayze syncline (Table 8-1; Figure 8-1).

The primary commodity is Ag, but Cu and Zn are also found. The mineralization is hosted in a succession of mafic and felsic metavolcanic rocks and is composed of disseminated pyrrhotite, chalcopyrite, sphalerite and pyrite. The alteration minerals in the mafic sections include carbonate, actinolite and quartz. The felsic sections are characterized by biotite, and weak carbonate and chlorite alteration. The best interval assayed 4.46 g/t Ag, 0.51% Zn and 0.16% Cu over 4.2 m (Kidd Creek).

8.7 Chester Gold Occurrence

The Chester Gold occurrence (MNDMF MDI: MDI41P12SW00020) is located in the southern Chester area of the Watershed Gold Property within the Chester Granitoid Complex (Table 8-1; Figure 8-1).

Gold is hosted by quartz veins in a stockwork of joints in granites of the Chester Granitoid Complex trending parallel to diabase dikes. In 1993, massive pyrite and visible gold was reported in the veins. However most of the pyrite is disseminated. Grab sample collected by the OGS in 1994 returned 143.16 g/t Au and 7.5 g/t Ag.

8.8 Eccles-Holmes #4 Vein Occurrence

The Eccles-Holmes #4 vein occurrence (MNDMF MDI: MDI41P12SW00127) is located in a shaft in the northern Chester area of the Watershed Gold Property east of Highway 11 (Table 8-1; Figure 8-1).

The mineralization is hosted in quartz veins within the felsic intrusive rocks of the Chester Granitoid Complex. The mineralization consists of pyrite, chalcopyrite, arsenopyrite, gold, bismuthinite, telluride, tetradymite and tourmaline. The alteration minerals include chlorite, carbonate and sericite. A grab sample in 1933 by Eccles-Holmes returned 48 g/t gold across 0.7 m. A grab sample collected by the OGS in 1993 returned 0.07 g/t Au and 0.3 g/t Ag.

8.9 Eccles-Holmes #1 Vein Occurrence

The Eccles-Holmes #1 vein occurrence (MNDMF MDI: MDI41P12SW00061) is located in the northern Chester area east of the Southcamp Bay (Table 8-1; Figure 8-1).

The mineralization is hosted in several discontinuous quartz and quartz-carbonate veins located in a locally strongly foliated phase of the Chester Granitoid Complex. The veins follow a series of fractures and are associated with disseminated sulphides adjacent to the veins. The sulfides in the mineralized zone include pyrite, chalcopyrite, molybdenite, arsenopyrite and gold. The alteration minerals are quartz, carbonate, sericite and chlorite. Channel sampling in 1979 (William Sims) returned 16 g/t over 1.4 m. An OGS grab sample assayed 0.34 g/t Au and 2.3 g/t Ag.

8.10 Miller DDH 1-71 Occurrence

The Miller DDH 1-71 molybdenum occurrence (MNDMF MDI: MDI41P12SW00126) is located east of the Southcamp Bay, northwest of the Eccles-Holmes #1 vein occurrence (Table 8-1; Figure 8-1).

The mineralization is located in a sheared and locally brecciated phase of granodiorite of the Chester Granitoid Complex. Molybdenite occurs in slips and disseminated with pyrite. No assay data are available.

9.0 EXPLORATION

Sanatana has commissioned Geotech Ltd. to complete a Z-TEM survey on the Watershed Property. Details of the survey are provided in Appendix 3.

In addition, Sanatana has commissioned Caracle Creek to complete a structural interpretation of the Watershed Property. Details of the interpretation are provided in Appendix 4.

10.0 INTERPRETATION AND CONCLUSIONS

The Watershed Property consists of 46 unpatented mineral claims located in the Swayze greenstone belt ~165 km north of Sudbury, Ontario.

The Watershed Gold Property is located in the southern part of the Swayze greenstone belt of the Western Abitibi Subprovince of the Superior Province of the Canadian Shield. Several gold occurrences were reported from the Watershed Property (Mineral Deposit Inventory, Ontario Ministry of Northern Development, Mines and Forestry).

The Z-TEM survey delineated several conductive structures on the Property. The structural interpretation also delineated several targets (Appendix 4) on the Property.

Based on the historic exploration data, the regional and property geology and on the personal inspection of the Property, Caracle Creek concludes that the Watershed Property has the potential to host gold mineralization.

11.0 RECOMMENDATIONS

The Z-TEM data has been inverted in 2D but no formal interpretation was provided by Geotech. An interpretation of this inversion data can be found in the structural interpretation (Appendix 4). A formal interpretation from Geotech, as well as inversions in 3D would help better understand the resistivity substructure. Caracle recommends mapping and sampling the geophysical anomalies to assess them for gold mineralization potential and to prioritize them for further exploration including diamond drilling. In addition it is recommended to map and sample all prominent structures and the prominent features in the southern part of the Property as identified by the structural interpretation.

12.0 REFERENCES

Ayer, J.A., Thurston, P.C., Bateman, R., Dubé, B., Gibson, H.L., Hamilton, M.A., Hathway,B., Hocker, S.M., Houlé, M.G., Hudak, G., Ispolatov, V.O., Lafrance, B., Lesher, C.M.,MacDonald, P.J., Péloquin, A.S., Piercey, S.J., Reed, L.E. and Thompson, P.H. 2005.Overview of results from the Greenstone Architecture Project: Discover Abitibi Initiative;Ontario Geological Survey, Open File Report 6154, 146p.

Ayer, J.A. and Trowell, N.F. 2002. Geological compilation of the Swayze area, Abitibi greenstone belt; Ontario Geological Survey, Preliminary Map P.3511, scale 1:100 000.

Dimroth E., Imreh, L., Goulet, N. and Rocheleau, M. 1983b. Evolution of the south-central segment of the Archean Abitibi belt, Quebec, Part III: Plutonic and metamorphic evolution and geotectonic model; Canadian Journal of Earth Sciences, v.20, p. 1374-1388.

Dubé, B. and Gosselin, P., 2007, Greenstone-hosted quartz-carbonate vein deposits, *in* Goodfellow, W.D. (ed.), Mineral Deposits of Canada: A Synthesis of Major Deposit-Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Models: Geological Association of Canada, Mineral Deposit Division, Special Publication No. 5, p. 49-73.

Goldfarb, R.J., Baker, T., Dubé, B., Groves, D.I., Hart, C.J.R. and Gosselin, P., 2005, Distribution, Character, and Genesis of Gold Deposits in Metamorphic Terranes: Economic Geology 100th Anniversary Volume, p. 407-450.

Heather, K.B., Shore, G.T. and van Breeman, O., 1995. The convoluted “layer-cake”: an old recipe with new ingredients for the Swayze greenstone belt, southern Superior Province, Ontario; in Current Research 1995-C, Geological Survey of Canada, p.1-10.

Heather, K.B. and Shore, G.T. 1999. Geology, Swayze Greenstone Belt, Ontario Geological Survey of Canada, Open File 3384a, f, g, scale: 1:50 000.

Jackson, S.L. and Fyon, J.A. 1991. The western Abitibi Subprovince in Ontario, *in* Geology of Ontario; Ontario Geological Survey, Special Volume 4, Part 1, p.405-482.

Keller, S.M. 2008. Technical report on the Augen Gold Corp. claims, Porcupine Mining Division, District of Sudbury, Ontario, Canada. Augen Gold Corp. unpublished internal report, prepared by Behre Dolbear & Company Ltd. 71p.

McRoberts, G. 2010a. Assessment report for diamond drilling in the Chester Gold area, South Swayze Property, Chester township, Porcupine Mining Division, Ontario, Canada, Augen Gold Corp., unpublished internal report.

McRoberts, G. 2010b. Assessment report for diamond drilling in the Schist Lake West area, South Swayze Property, Yeo township, Porcupine Mining Division, Ontario, Canada. Augen Gold Corp., unpublished internal report.

Sirgusa, G.M. 1993. Geology, geochemistry and mineralization of the southern margin of the Swayze belt; Ontario Geological Survey, Open File Report 5844, 144p.

Appendix 1

Authors' Certificates of Qualifications

Jenna McKenzie
34 King St East, 9th Floor
Toronto, Ontario, Canada, M5C 2X8
Telephone: 416-368-1801
Email: jmckenzie@caraclecreek.com

CERTIFICATE OF AUTHOR

I, Jenna McKenzie, do hereby certify that:

1. I am employed as Geophysicist for the geological consulting firm of Caracle Creek International Consulting Inc. Canada.

2. I am jointly responsible for the Report titled "Assessment Report, Z-TEM Survey, Watershed Property", dated March 12, 2012 and prepared for Sanatana Resources Inc.

3. I hold the following academic qualifications: Honours B.Sc. Applied Physics: Geophysics (2002), University of Toronto, Canada.

4. I am a member in good standing of the Association of Professional Geologists of Ontario (APGO), member # 1653, the Canadian Exploration Geophysical Society (KEGS) and the Society of Exploration Geophysicists (SEG).

5. I have worked as a geophysicist in industry since 2001 and have worked on a variety of properties including diamond, oil-industry seismic processing, gold, potash, and Ni-Cu-PGE.

7. I have had no prior involvement with the Property that forms the subject of this Report.

Dated this 12th of March 2012

Respectfully submitted,

“signed and sealed”

Jenna McKenzie______

Jenna McKenzie, P.Geo

Elisabeth Ronacher
25 Frood Road
Sudbury, Ontario, Canada, P3C 4Y9
Telephone: 705-671-1801
Email: eronacher@caraclecreek.com

CERTIFICATE OF AUTHOR

I, Elisabeth Ronacher, do hereby certify that:

1. I am employed as Senior Geologist for the geological consulting firm of Caracle Creek International Consulting Inc. Canada.

2. I am jointly responsible for the Report titled "Assessment Report, Z-TEM Survey, Watershed Property", dated March 12, 2012 and prepared for Sanatana Resources Inc.

3. I hold the following academic qualifications: M.Sc. Geology (1997), University of Vienna, Vienna, Austria; Ph.D. Geology (2002), University of Alberta, Edmonton, Canada.

4. I am a member in good standing of the Association of Professional Geologists of Ontario (APGO), member # 1476, the Society of Economic Geologists (SEG) and the Society for Geology Applied to Mineral Deposits (SGA).

5. I have worked on exploration projects worldwide (including Canada, Mongolia, China, Austria) and have worked on Au, Cu, base metal, Cu-Ni PGE and U deposits since 2003.

7. I have had no prior involvement with the Property that forms the subject of this Report.

Dated this 12th of March 2012

Respectfully submitted,

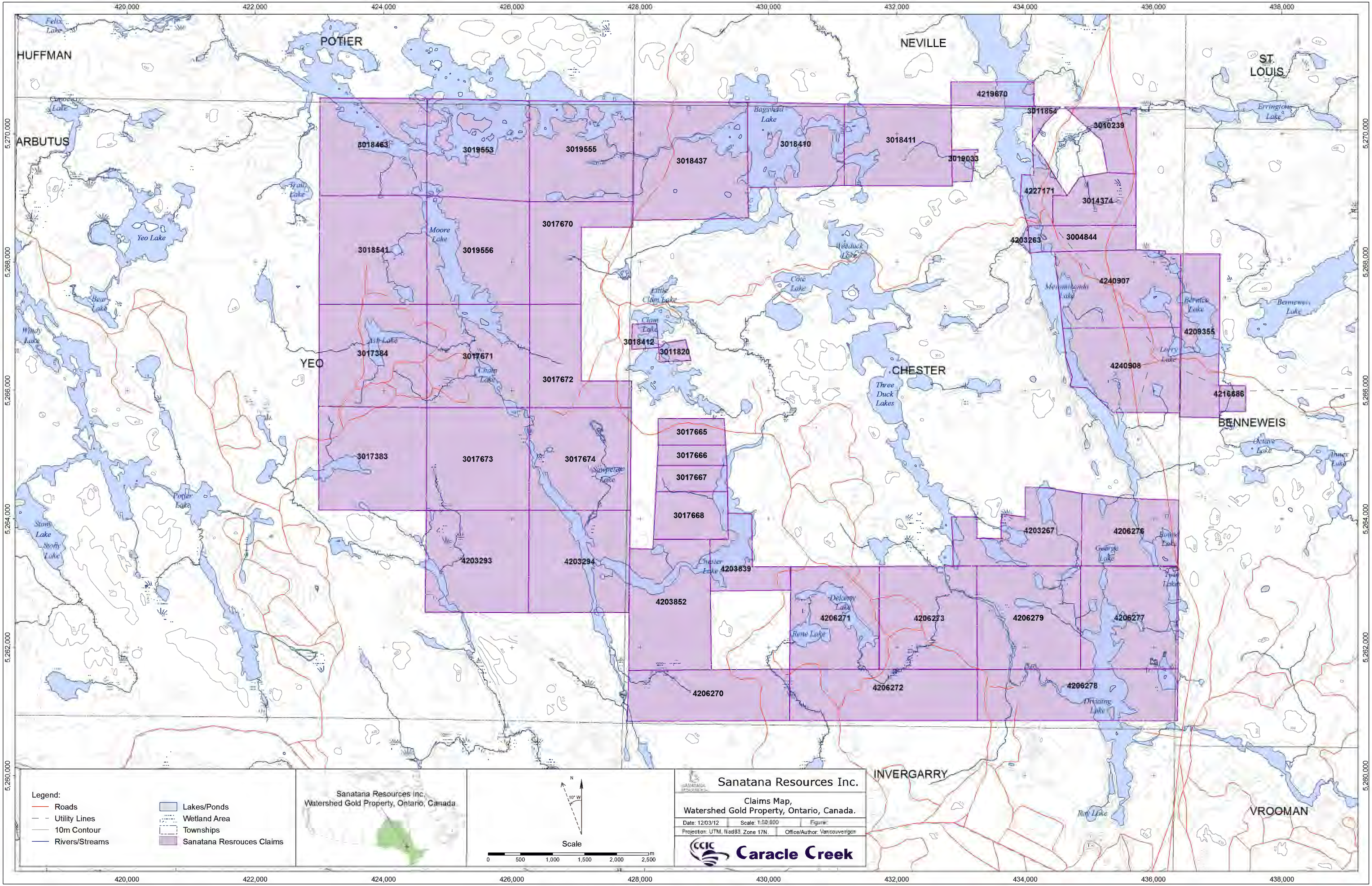
“signed and sealed”

Elisabeth Ronacher ______

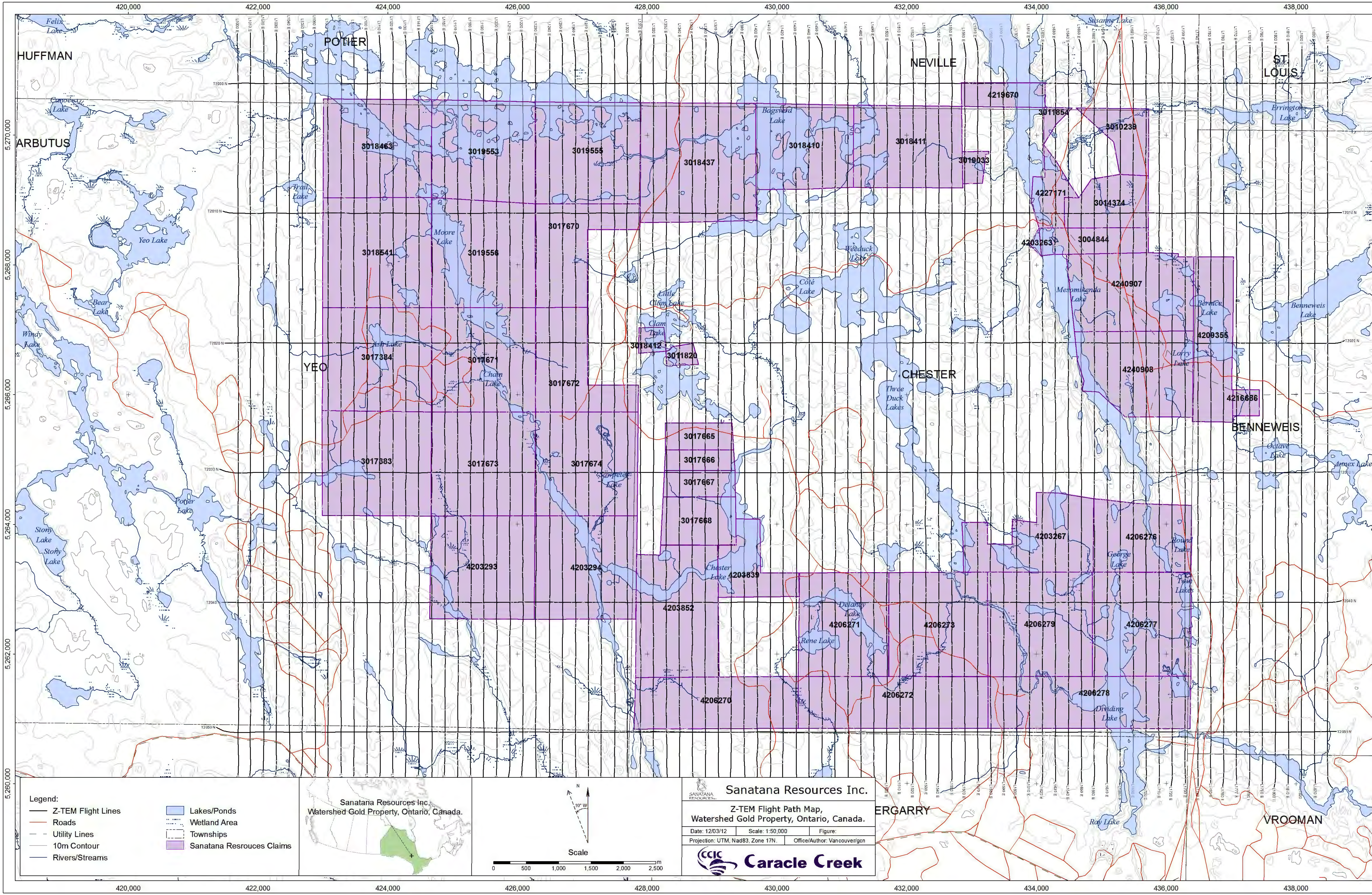
Elisabeth Ronacher, PhD, P.Geo

Appendix 2

Map



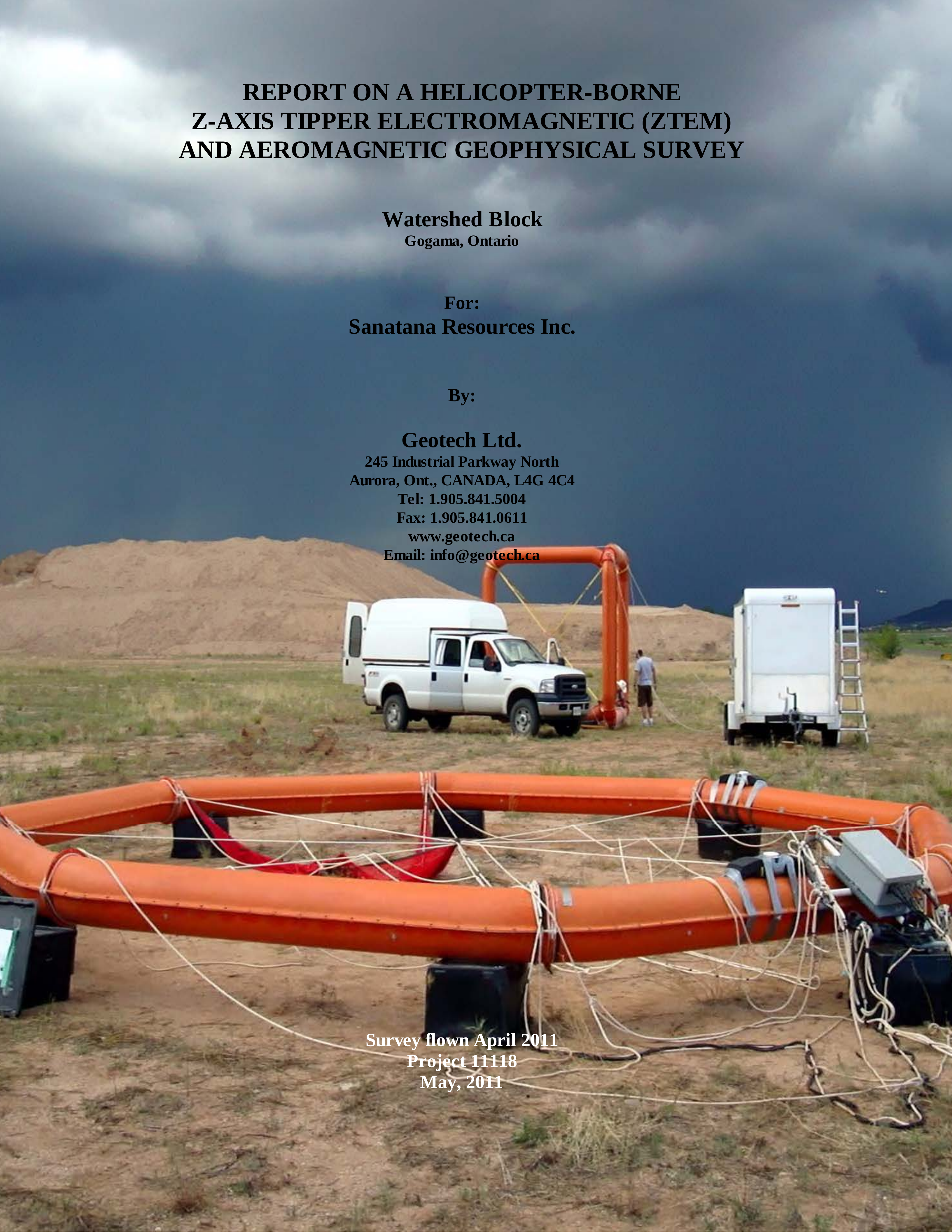
HUFFMAN
POTIER
NEVILLE
ST. LOUIS
ARBUTUS
YEO
CHESTER
BENNEWEIS
INVERGARRY
VROOMAN
Yeo Lake
Moore Lake
Ash Lake
Bagsverd Lake
Little Clam Lake
Clam Lake
Three Duck Lakes
Mesomikenda Lake
Chester Lake
Delaney Lake
Rene Lake
3018463
3019553
3019555
3018437
3018410
3018411
4219670
3011854
3010239
3019033
4227171
3014374
4203263
3004844
3017670
3018541
3019556
4240907
3018412
3011820
3017384
3017671
3017672
4209355
4240908
4216686
3017665
3017666
3017667
3017668
3017383
3017673
3017674
4203267
4206276
4203293
4203294
4203839
4203852
4206271
4206273
4206279
4206277
4206270
4206272
4206278
Legend:
Roads
Utility Lines
10m Contour
Rivers/Streams
Lakes/Ponds
Wetland Area
Townships
Sanatana Resrouces Claims
Sanatana Resources Inc.
Watershed Gold Property, Ontario, Canada
Scale
Sanatana Resources Inc.
Claims Map,
Watershed Gold Property, Ontario, Canada.
Date: 12/03/12
Scale: 1:50,000
Projection: UTM, Nad83, Zone 17N.
Caracle Creek



HUFFMAN
POTIER
NEVILLE
ST. LOUIS
ARBUTUS
YEO
CHESTER
BENNEWEIS
ERGARRY
VROOMAN
Felix Lake
Canoe Lake
Trail Lake
Yeo Lake
Bear Lake
Windy Lake
Potter Lake
Stony Lake
Moore Lake
Ash Lake
Chain Lake
Bagsverd Lake
Weeduck Lake
Côté Lake
Little Clam Lake
Clam Lake
Three Duck Lakes
Chester Lake
Delaney Lake
Rene Lake
Susanne Lake
Errington Lake
Mesomikenda Lake
Bernice Lake
Lorry Lake
Benneweis Lake
Octave Lake
Annex Lake
George Lake
Round Lake
Twin Lakes
Dividing Lake
Ray Lake
3018463
3019553
3019555
3018437
3018410
3018411
3019033
4219670
3011854
3010239
4227171
3014374
3004844
4203263
3017670
3018541
3019556
4240907
4208355
3018412
3011820
3017384
3017671
3017672
4240908
4216686
3017665
3017666
3017667
3017668
3017383
3017673
3017674
4203267
4206276
4203293
4203294
4203839
4203852
4206271
4206273
4206279
4206277
4206270
4206272
4206278
420,000
422,000
424,000
426,000
428,000
430,000
432,000
434,000
436,000
438,000
5,270,000
5,268,000
5,266,000
5,264,000
5,262,000
5,260,000
Legend:
Z-TEM Flight Lines
Roads
Utility Lines
10m Contour
Rivers/Streams
Lakes/Ponds
Wetland Area
Townships
Sanatana Resrouces Claims
Sanatana Resources Inc.
Watershed Gold Property, Ontario, Canada.
Scale
0 500 1,000 1,500 2,000 2,500 m
Sanatana Resources Inc.
Z-TEM Flight Path Map,
Watershed Gold Property, Ontario, Canada.
Date: 12/03/12
Scale: 1:50,000
Figure:
Projection: UTM, Nad83, Zone 17N.
Office/Author: Vancouver/gcn
Caracle Creek

Appendix 3

Geophysical Report



REPORT ON A HELICOPTER-BORNE Z-AXIS TIPPER ELECTROMAGNETIC (ZTEM) AND AEROMAGNETIC GEOPHYSICAL SURVEY

Watershed Block

Gogama, Ontario

For:

Sanatana Resources Inc.

By:

Geotech Ltd.

245 Industrial Parkway North
Aurora, Ont., CANADA, L4G 4C4
Tel: 1.905.841.5004
Fax: 1.905.841.0611
www.geotech.ca
Email: info@geotech.ca

Survey flown April 2011
Project 11118
May, 2011

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

REPORT ON A HELICOPTER-BORNE Z-AXIS, TIPPER ELECTROMAGNETIC (ZTEM) AND AEROMAGNETIC GEOPHYSICAL SURVEY

Watershed Block
Gogama, Ontario

Executive Summary

During April 4th to 19th 2011 Geotech Ltd. carried out a helicopter-borne geophysical survey for Sanatana Resources Inc. over the Watershed Block situated 12 kilometres southwest of Gogama, Ontario, Canada.

Principal geophysical sensors included a Z-Axis Tipper electromagnetic (ZTEM) system, and a caesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 641 line-kilometres of geophysical data were acquired during the survey.

The survey operations were based out of the town of Gogama, Ontario. In-field data quality assurance and preliminary processing were carried out on a daily basis during the acquisition phase. Preliminary and final data processing, including generation of final digital data and map products were undertaken from the office of Geotech Ltd. in Aurora, Ontario.

The survey report describes the procedures for data acquisition, processing, final image presentation and the specifications for the digital data set. 2D inversions over two selected lines were performed in support of the ZTEM survey results.

1. INTRODUCTION

1.1 General Considerations

These services are the result of the Agreement made between Geotech Ltd. and Sanatana Resources Inc to perform a helicopter-borne geophysical survey over the Watershed block located 12 kilometres southwest of Gogama, Ontario, Canada (Figure 1).

Troy Gill represented Sanatana Resources Inc during the data acquisition and data processing phases of this project.

The geophysical surveys consisted of helicopter borne AFMAG Z-axis Tipper electromagnetic (ZTEM) system and aero magnetics using a caesium magnetometer. A total of 641 line kilometres of geophysical data were acquired during the survey. The survey area is shown in Figure 2.

In a ZTEM survey, a single vertical-dipole air-core receiver coil is flown over the survey area in a grid pattern, similar to regional airborne EM surveys. Two orthogonal, air-core horizontal axis coils are placed close to the survey site to measure the horizontal EM reference fields. Data from the three coils are used to obtain the Tzx and Tzy Tipper (Vozoff, 1972) components at six frequencies in the 30 to 720 Hz band. The ZTEM is useful in mapping geology using resistivity contrasts and magnetometer data provides additional information on geology using magnetic susceptibility contrasts.

Figure 1 -Property Location

The crew was based out of Gogama in, Ontario, for the acquisition phase of the survey. Survey flying was started on April 4th 2011 and finished on April 19th 2011.

Data quality control and quality assurance, and preliminary data processing were carried out on a daily basis during the acquisition phase of the project. Final reporting, data presentation and archiving were completed from the Aurora office of Geotech Ltd. in May, 2011.

1.2 Survey Location

The Block is located approximately 12 kilometres to the southwest of Gogama, Ontario, as shown in Figure 2.

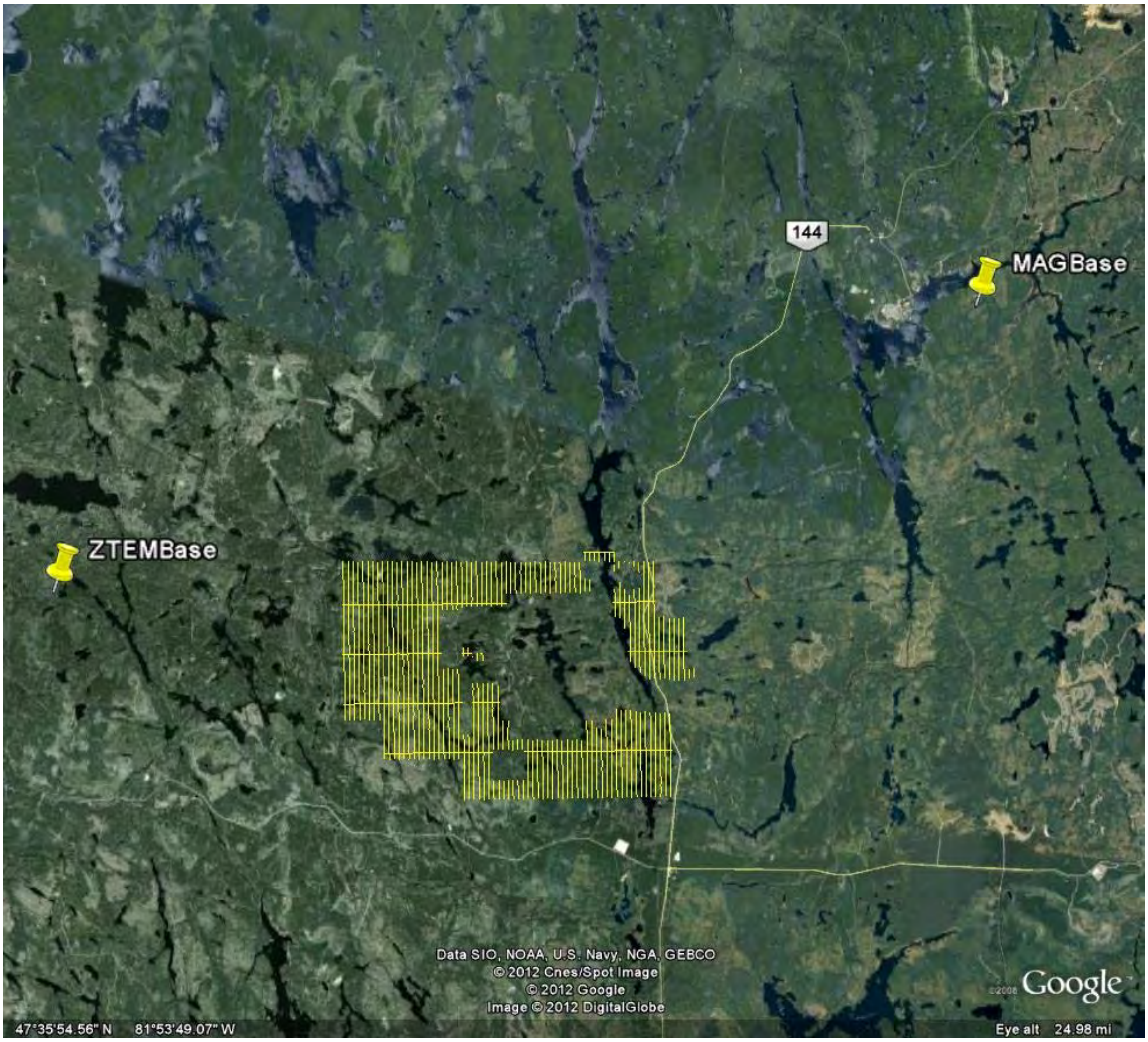


Figure 2 – The Block, with ZTEM and Magnetic Base Station Locations

The block was flown in a south to north (N 0° E azimuth) direction, with a flight line spacing of 200 metres, as depicted in Figure 3. Tie lines were flown perpendicular to the traverse lines at a spacing of 2000 metres (N 90° E azimuth). For more detailed information on the flight spacing and direction see Table 1.

1.3 Topographic Relief and Cultural Features

Topographically, the block exhibits a shallow relief with an elevation ranging from 369 to 455 metres above mean sea level over an area of 196.6 square kilometres (Figure 3). The survey area has various rivers and streams running throughout it which connect various lakes and wetlands. There are visible signs of culture throughout the survey, such as trails, roads and Highway 144 runs along the east end of the block. There are also a number buildings and a power line located in the northeast corner. The survey block covers a number of Ontario Mining Claims, which are shown in Appendix A. The survey block is covered by NTS (National Topographic Survey) of Canada sheets 041O09, 041P12, 041O08 and 041P05.

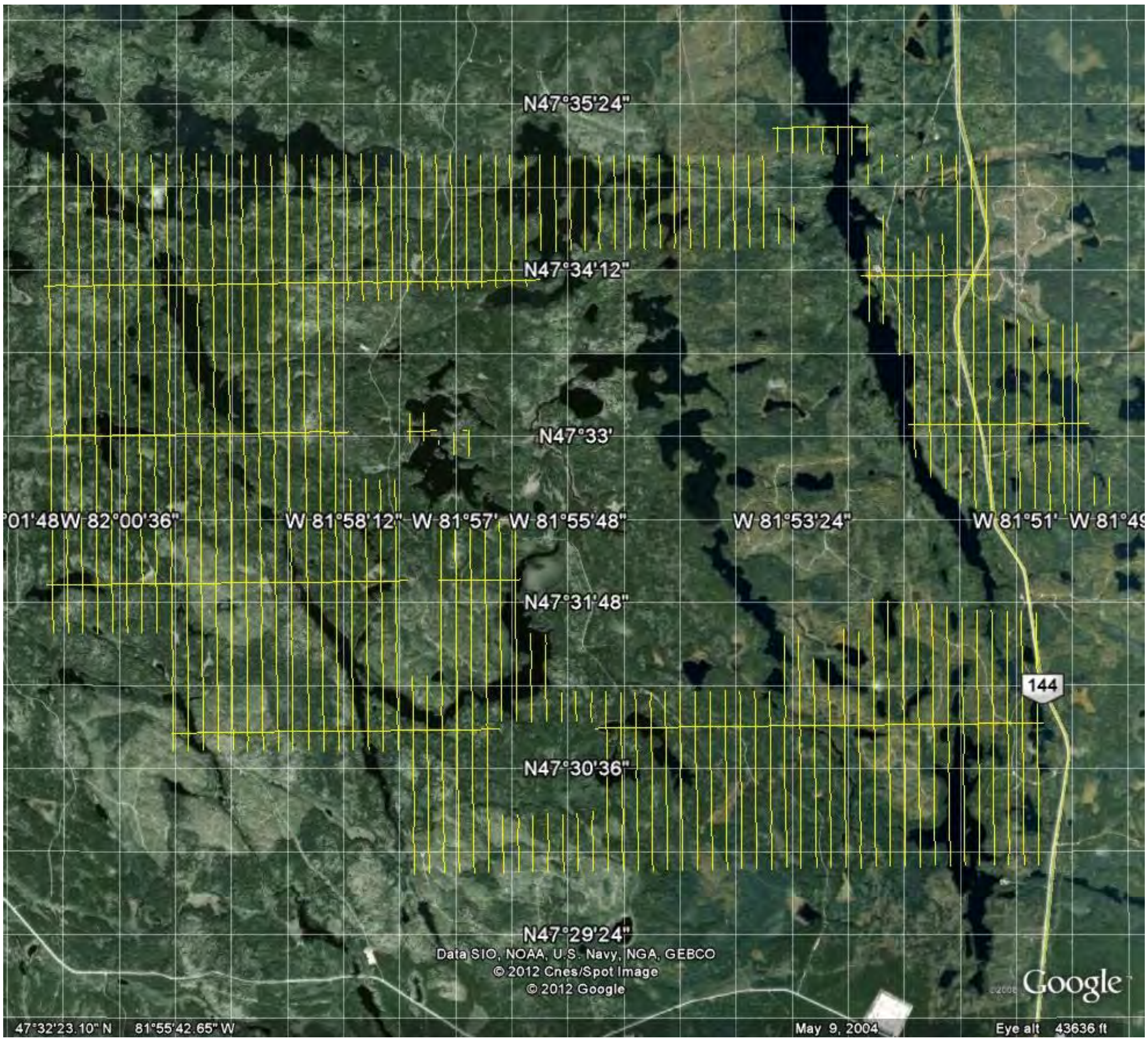


Figure 3 - Google Earth image of the block

2. DATA ACQUISITION

2.1 Survey Area

The survey block (see Location map in Appendix A and Figure 2) and general flight specifications are as follows:

Table 1 - Survey Specifications

Survey block	Traverse Line spacing (m)	Area (Km^2)	Planned Line-km	Actual[1] Line-km	Flight direction	Line numbers
Watershed	Traverse: 200	78	944.7	594.7	N 0° E / N 180° E	L1000 – L1840
	Tie: 2000		100.8	46.3	N 90° E / N 270° E	T2000 – T2050
TOTAL		**78**	**1045.5**	**641**		

Survey block boundaries co-ordinates are provided in Appendix B.

2.2 Survey Operations

Survey operations were based out of Gogama, Ontario on April 4th, 2011 until April 19th 2011. The following table shows the timing of the flying.

Table 2 - Survey schedule

Date	Flight #	Block	Crew location	Comments
4-Apr-2011			Gogama, ON	Could not commence due to weather
5-Apr-2011			Gogama, ON	Could not commence due to weather
6-Apr-2011			Gogama, ON	Could not commence due to weather
7-Apr-2011			Gogama, ON	Could not commence due to weather
8-Apr-2011			Gogama, ON	System Assembly
9-Apr-2011			Gogama, ON	System Assembly
10-Apr-2011			Gogama, ON	No production due to technical issues
11-Apr-2011			Gogama, ON	No production due to technical issues
12-Apr-2011			Gogama, ON	System assembly continued
13-Apr-2011			Gogama, ON	Assembly completed and testing
14-Apr-2011			Gogama, ON	Base station relocated
15-Apr-2011	1	Watershed	Gogama, ON	267km flown
16-Apr-2011			Gogama, ON	No production due to weather
17-Apr-2011			Gogama, ON	No production due to weather
18-Apr-2011	2,3	Watershed	Gogama, ON	567km flown
19-Apr-2011	4	Watershed	Gogama, ON	Remaining kms were flown

[1] Actual line-km represents the total line-km contained in the final databases. These line-km normally exceed the Planned line-km's, as indicated in the survey NAV files, however, for this survey the area was clipped to the client claims.

2.3 Flight Specifications

During the survey the helicopter was maintained at a mean height of 151 metres above the ground with a nominal survey speed of 80 km/hour for the survey block. This allowed for a nominal EM sensor terrain clearance of 77 metres and a magnetic sensor clearance of 94 metres.

The on board operator was responsible for monitoring the system integrity. He also maintained a detailed flight log during the survey, tracking the times of the flight as well as any unusual geophysical or topographic feature.

On return of the aircrew to the base camp the survey data was transferred from a compact flash card (PCMCIA) to the data processing computer. The data were then uploaded via ftp to the Geotech office in Aurora for daily quality assurance and quality control by trained personnel.

2.4 Aircraft and Equipment

2.4.1 Survey Aircraft

The survey was flown using a Eurocopter Aerospatiale (Astar) 350 B3 helicopters, registration number C-GEOZ. The helicopter was operated by Geotech Aviation. Installation of the geophysical and ancillary equipment was carried out by a Geotech Ltd crew.

2.4.2 Airborne Receiver

The airborne ZTEM receiver coil measures the vertical component (Z) of the EM field. The receiver coil is a Geotech Z-Axis Tipper (ZTEM) loop sensor which is isolated from most vibrations by a patented suspension system and is encased in a fibreglass shell. It is towed from the helicopter using a 90 metre long cable as shown in Figure 4. The cable is also used to transmit the measured EM signals back to the data acquisition system.

The coil has a 7.4 metre diameter with an orientation to the Vertical Dipole. The digitizing rate of the receiver is 2000 Hz. Attitudinal positioning of the receiver coil is enabled using 3 GPS antennas mounted on the coil. The output sampling rate is 0.4 seconds (see Section 2.4.7)

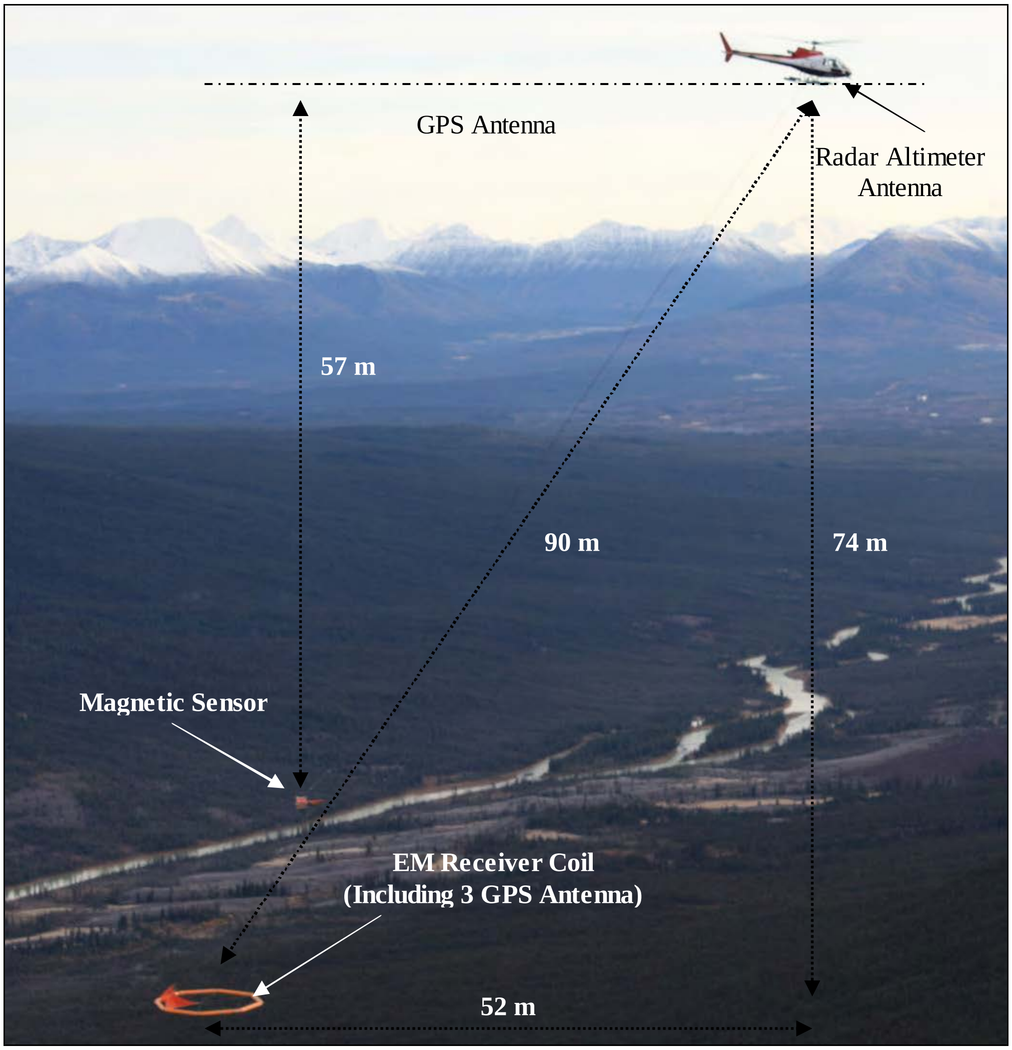


Figure 4 - ZTEM System Configuration

2.4.3 Base Station Receiver

The two Geotech ZTEM base station receiver coils measure the orthogonal, horizontal X and Y components of the EM reference field. They are set up perpendicular to each other and roughly oriented according to the flight line direction. The orientation of both units is not critical as the horizontal field can be further decomposed into the two orientations of the survey flight. The orientation of the base stations were measured using a compass.

The base station coils each have a diameter of 3.5 meters, with the coil orientations to the horizontal dipole, as shown in Figure 5.

The Block base station receiver coils were installed in an open area off and unused dirt road (47°34'19.6 N, 82°10'47.0 W). The azimuth of the reference coil was N90°E (named as A) and for the orthogonal component it was N180°E (named as B). Angles A and B are taken into account together with the survey lines azimuth to calculate the in-line (Tzx) and cross-line (Tzy) field utilizing a proprietary software.

Figure 5 - ZTEM base station receiver coils.

2.4.4 Airborne magnetometer

The magnetic sensor utilized for the survey was a Geometrics split-beam optically pumped caesium vapour magnetic field sensor, mounted in a separate bird, and towed on a cable at a mean distance of 57 metres below the helicopter (Figure 4). The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds. The magnetometer will perform continuously in areas of high magnetic gradient with the ambient range of the sensor approximately 20k-100k nT. The Aerodynamic magnetometer noise is specified to be less than 0.5 nT. The magnetometer sends the measured magnetic field strength as nanoTesla to the data acquisition system via the RS-232 port.

2.4.5 Radar Altimeter

A Terra TRA 3000/TRI 40 radar altimeter was used to record terrain clearance. The antenna was mounted beneath the bubble of the helicopter cockpit.

2.4.6 GPS Navigation System

The navigation system used was a Geotech PC104 based navigation system utilizing a NovAtel CDGPS (Canada-Wide Differential Global Positioning System Correction Service) enabled Propak V3-RT20 GPS receiver. Geotech's Navigate software, using a full screen display with controls in front of the pilot, allows him to direct the flight.

5 NovAtel GPS antennas are utilized during the survey; one is mounted on the helicopter tail (Figure 4), one installed with the Receiver Base Station (Figure 5) and three are mounted on the airborne receiver (Figure 4). As many as 14 GPS and two CDGPS satellites may be monitored at any one time. The horizontal positional accuracy or circular error probability (CEP) is 1.8 m, with CDGPS active, it is 0.6 m. The co-ordinates of the block were set-up prior to the survey and the information was fed into the airborne navigation system.

2.4.7 Digital Acquisition System

The power supply and the data acquisition system are mounted on an equipment rack which is installed into the helicopter. Signal and power wires are run through the helicopter to connect on to the tow cable outside. The tow cable supports the ZTEM and magnetometer birds during flight via a safety shear pin connected to the helicopter hook. The major power and data cables have a quick disconnect safety feature as well. The installation was undertaken by the Geotech Ltd. crew and was certified before surveying.

A Geotech data acquisition system recorded the digital survey data on an internal compact flash card. Data is displayed on an LCD screen as traces to allow the operator to monitor the integrity of the system. The data type and sampling interval as provided in Table 3.

Table 3 - Acquisition and Processing Sampling Rates

DATA TYPE	ACQUISITION SAMPLING	PROCESSING SAMPLING
ZTEM Receiver	0.0005 sec	0.4 sec
Magnetometer	0.1 sec	0.4 sec
GPS Position	0.2 sec	0.4 sec
Radar Altimeter	0.2 sec	0.4 sec
ZTEM Base station	0.0005 sec	– –

2.4.8 Mag Base Station

A combined magnetometer/GPS base station was utilized on this project. A Geometrics Caesium split-beam vapour magnetometer was used as a magnetic sensor with a sensitivity of 0.001 nT. The base station was recording the magnetic field together with the GPS time at 1 Hz on a base station computer.

The base station magnetometer sensors for the block (47°40'34.67 N, 81°40'50.57 W) were installed in an open area behind Gogama Lodge away from electric transmission lines and moving ferrous objects such as motor vehicles. The base station data were backed-up to the data processing computer at the end of each survey day.

3. PERSONNEL

The following Geotech Ltd. personnel were involved in the project.

Field:

Project Manager:	Darren Tuck (Office)
Data QA/QC:	Nick Venter (Office)
Crew chief:	Jason McLinnon
System Operators:	Roger LeBlanc Sam McNeil

The survey pilot and the mechanical engineer were employed directly by the helicopter operator – Geotech Aviation.

Pilot:	Brad MacRae

Office:

Preliminary Data Processing:	Nick Venter
Final Data Processing:	Lily Manoukian
Final Data QC:	Francis Tong
2D Inversions:	Shengkai Zhao
Reporting/Mapping:	Wendy Acorn

Data acquisition phase was carried out under the supervision of Andrei Bagrianski, P. Geo, Chief Operating Officer. Processing and 2D Inversions phases were carried out under the supervision of Jean Legault, P. Geo, P. Eng, Chief Geophysicist (Interpretation). The overall contract management and customer relations were by Paolo Berardelli.

4. DATA PROCESSING AND PRESENTATION

Data compilation and processing were carried out by the application of Geosoft OASIS Montaj and programs proprietary to Geotech Ltd.

4.1 Flight Path

The flight path, recorded by the acquisition program as WGS 84 latitude/longitude, was converted into the WGS 84, UTM Zone 17 North coordinate system in Oasis Montaj.

The flight path was drawn using linear interpolation between x, y positions from the navigation system. Positions are updated every second and expressed as UTM easting's (x) and UTM northing's (y).

4.2 In-field Processing and Quality Control

In-Field data processing and quality control are done on a flight by flight basis by a qualified data processor (see Section 3.0). Processing steps and check up procedures are designed to assure the best possible final quality of ZTEM survey data. A general overview of those steps is presented in the following paragraphs.

The In-Field quality control can be separated into several phases:

a. GPS Processing Phase: GPS Data are first examined and evaluated during the GrafMov processing.
b. Raw data, ZTEM viewer phase:

    Data can be viewed, examined for consistency, individual channel spectra examined and overall noise estimated in the viewer provided by the ZTEM proprietary software, on the raw flight data and raw base station data separately, on the merged data, and finally on the data that have undergone ZTEM processing.

c. Field Geosoft phase:

    Magnetic data, Radar altimeter data, GPS positioning data are re-examined and processed in this phase. Prior to splitting the lines EM data are examined flight by flight and the effectiveness of applying the attitude correction evaluated. After splitting the lines, a set of grids are generate for each parameter and their consistency evaluated. Data profiles are also re-evaluated on a line to line basis. A power line monitor channel is available in order to identify power line noise.

4.3 GPS Processing

Three GPS sensor (mounted on the airborne receiving loop) measurements were differentially corrected using the Waypoint GrafMov^{TM} software in order to yield attitude corrections to recorded EM data.

4.4 ZTEM Electromagnetic Data

The ZTEM data were processed using proprietary software. Processing steps consist of the following preliminary and final processing steps:

4.4.1 Preliminary Processing

a. Airborne EM, Mag, radar altimeter and GPS data are first merged with EM base station data into one file.
b. Merged data are viewed and examined for consistency in an incorporated viewer
c. In the next, processing phase, the following entities are taken into account:
   - the Base station coils orientation with respect to the Magnetic North,
   - the Local declination of the magnetic field,
   - Suggested direction of the X coordinate (North or line direction),
   - Sensitivity coefficient that compensates for the difference in geometry between the base station and airborne coils.
   - Rejection filters for the 60 Hz and helicopter generated frequencies.
d. Six frequencies (30, 45, 90, 180, 360, and 720 Hz) are extracted from the airborne EM time-series coil response using windows of 0.4 seconds and the base station coils using windows of 1.0 seconds.
e. The real (In-Phase) and imaginary (Quadrature) parts of the tipper transfer functions are derived from the In-line (X or Tzx) and Cross-line (Y or Tzy) components.
f. Such processed EM data are then merged with the GPS data, magnetic base station data and exported into a Geosoft xyz file.

4.4.2 Geosoft Processing

Next stage of the preliminary data processing is done in a Geosoft ™ environment, using the following steps:

a. Import the output xyz file from the AFMAG processing, as well as the base Mag data into one database.
b. Split lines according to the recorded line channel,
c. GPS processing, flight path recovery (correcting, filtering, calculating Bird GPS coordinates, line splitting)
d. Radar altimeter processing, yielding the altitude values in metres.
e. Magnetic spike removal, filtering (applied to both airborne and base station data). Calculation of a base station corrected mag.
f. Apply preliminary attitude corrections to EM data (In phase and Quadrature), filter and make preliminary grids and profiles of all channels.

4.4.3 Final Processing

Final data processing and quality control were undertaken by Geotech Ltd headquarters in Aurora, Ontario by qualified senior data processing personnel.

A quality control step consisted of re-examining all data in order to validate the preliminary data processing and to allow for final adjustments to the data.

Attitude corrections were re-evaluated, and re-applied, on component by component, flight by flight, and frequency by frequency bases. Any remaining line to line system noise was removed by applying a mild additional levelling correction.

4.4.4 ZTEM Profile Sign Convention

Tzx and Tzy tipper components do not exhibit maxima or minima above conductors, resistors or at contacts; in fact they produce cross-over type anomalies (Ward, 1959; Vozoff, 1972; Labson, 1985). The crossover polarity sign convention for ZTEM is according to the right hand Cartesian rule (Z positive –up) that is commonly used for multi-component transient electromagnetic methods.

For the South to North lines of the Block the sign convention for the Tzx in-line component crossover is positive-negative pointing South to North for tabular conductors perpendicular to the profile (Figure 6). The corresponding Tzy component in-phase cross-over polarity is positive-negative pointing East to West (90 degrees counter clockwise to Tzx) according to the right hand Cartesian rule.

Conversely, tabular resistive bodies produce In-Phase cross-over's that are opposite in sign to conductors. A brief discussion of ZTEM and AFMAG, along with selected forward model responses is presented in Appendix D.

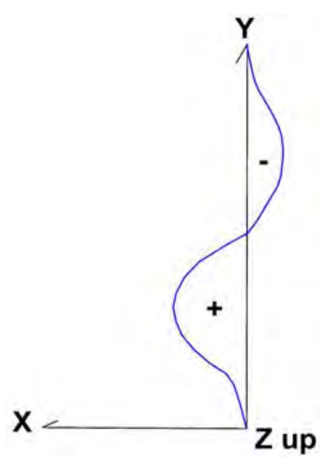


Figure 6 - ZTEM Crossover Polarity Convention for Tzx and Tzy for the block

4.4.5 ZTEM Quadrature Sign Dependence

One important note regarding the sign of the ZTEM Quadrature, relative to the In-Phase component, particularly with regards to computer modeling and inversion.

The sign of the magnetotelluric Quadrature relative to the In-Phase tipper transfer function component pertains to the Fourier transformation of the time series to give frequency domain spectra. There are two widely used conventions for time dependence in the transformations, **exp(+iωt)** and **exp(-iωt).** That which is implemented largely is a matter of personal preference and precedent. The importance of the In-Phase and Quadrature sign convention is not critical, provided that it is known and documented.

In ZTEM, the data processing code used for the Fourier transformation the time-series data to frequency domain spectra adopts a **exp(-iωt)** time dependence (J. Dodds, Geo Equipment Manufacturing, pers. comm., Nov-2009). Whereas in the forward modeling and inversion program Zvert2d, the sign of the Quadrature relative to the In-Phase transfer function assumes an **exp(+iωt)** dependence[2].

As a result, for users interested in computer modeling and inversion of ZTEM data, the sign of the Quadrature will need to be reversed, relative to the In-Phase component, in order to provide a proper result (Figure 7). Indeed this reverse Quadrature polarity convention is assumed in all forward modeling and inversion of ZTEM data, as described in Figures 5-7 in Appendix D.

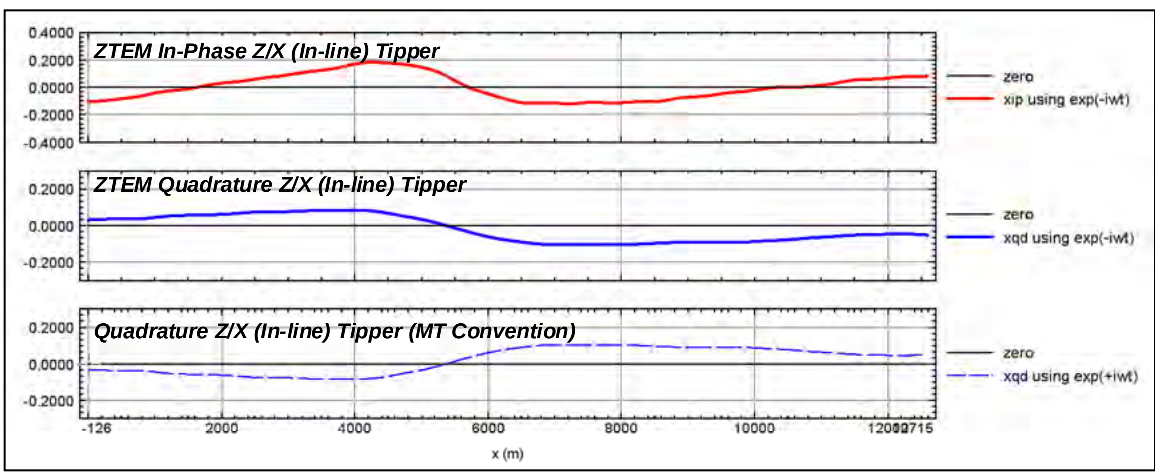


Figure 7 - Illustration of ZTEM In-Phase & Quadrature Tipper transfer function polarity convention (e-iωt) relative to equivalent MT Tipper Quadrature polarity convention (e+iωt) for a graphitic conductor in Athabasca Basin, SK.

---

2 Phillip E. Wannamaker (2009): Two-dimensional Inversion of ZTEM data: Synthetic Model Study and Test Profile Images, Internal Geotech technical report by Emblem Exploration Services Inc., January 22, 2009, 32 pp.

4.4.6 Total Divergence and Phase Rotation Processing

In a final processing step DT (Total Divergence) and PR (Phase Rotation) processing are applied to the multi-frequency In-phase and Quadrature ZTEM data. This is due to the crossover nature of the Tipper Responses; these additional processing steps are applied to convert them into local maxima for easier interpretation.

To present the data from both tipper components into one image, the Total Divergence parameter, termed the DT is calculated from the horizontal derivatives of the Tzx and Tzy tippers (Lo and Zang, 2008). It is analogous to the "Peaker" parameter in VLF (Pedersen, 1998).

Total Divergence DT: ***DT = DIV (Tzx, Tzy)***   ***= d(Tzx)/dx+d(Tzy)/dy***

This DT parameter was introduced by Petr Kuzmin (Milicevic, 2007, p. 13) and is derived for each of the In Phase and Quadrature components at individual frequencies. These in turn allow for minima over conductors and maxima over resistive zones. DT grids for each of the extracted frequencies were generated accordingly, using a reverse colour scheme with warm colours over conductors and cool colours over resistors.

The DT gives a clearer image of conductor's location and shape but, as a derivative, it does not preserve some of the long wavelength information and is also sensitive to noise.

As an alternative, a 90 degree Phase Rotation (PR) technique is also applied to the grids of each individual component (Tzx and Tzy). It transforms bipolar (cross over) anomalies into single pole anomalies with a maximum over conductors, while preserving long wavelength information (Lo et al., 2009). The two orthogonal grids are then usually added to obtain a Total Phase Rotated (TPR) grid for the In-Phase and Quadrature.

Total Phase-Rotation TPR: ***= PR (Tzx) + PR (Tzy)***

A presentation of the ZTEM test survey results over unconformity uranium deposits that illustrates DT and TPR examples, as documented by Lo et al. (2009) is provided in Appendix E.

4.4.7 2D EM Inversion

2d inversions of the ZTEM results were performed over selected lines using the Geotech Av2dtopo software developed by Phil Wannamaker, U. of Utah, for Geotech Ltd. The inversion algorithm is based on the 2D inversion code with Jacobians of de Lugao and Wannamaker (1996), the 2D forward code of Wannamaker et al (1987), and the Gauss-Newton parameter step equations of Tarantola (1987). It also implements a depth-of-investigation (DOI) index, using the 1.5x MT maximum skin depth and integrated 1D conductance method of Spies (1989). This is shown using a dashed DOI line and opaque coloring in the 2d inversion section of Appendix F.

The 2D code only considers the In-Line (Z/X) data and assumes that the strike lengths of bodies are infinite and orthogonal to the profile. The code is designed to account for the ZTEM vertical coil receiver and fixed base station reference measurements. The inversion uses a model-mesh consisting of 440 cells laterally and 62 cells vertically. Typically the ZTEM data are de-sampled to 180-200 pts, in order to allow the inversion to run in 10minutes or less. Typically, between 1-2% errors are added to the In-line in-phase (XIP) and Quadrature (XQD) data obtained at 30,45,90,180,360 & 720Hz. Errors are adjusted until numerical convergence (<1.0 rms) is attained in 8 iterations or less. All inversions are based on a 1k ohm-m homogeneous starting half-space model.

4.5 Magnetic Data

The processing of the total magnetic field intensity (TMI) data involved the correction for diurnal variations by using the digitally recorded ground base station magnetic values. The base station magnetometer data was edited and merged into the Geosoft GDB database on a daily basis. The aeromagnetic data was corrected for diurnal variations by subtracting the observed magnetic base station deviations.

The corrected magnetic data was interpolated between survey lines using a random point gridding method to yield x-y grid values for a standard grid cell size of 50 metres. The Minimum Curvature algorithm was used to interpolate values onto a rectangular regular spaced grid.

5. DELIVERABLES

5.1 Survey Report

The survey report describes the data acquisition, processing, and final presentation of the survey results. The survey report is provided in two paper copies and digitally in PDF format.

5.2 Maps

Final maps were produced at scale of 1:20,000. The coordinate/projection system used was WGS84, UTM Zone 17 North. All maps show the flight path trace and topographic data; latitude and longitude are also noted on maps.

The preliminary and final results of the survey are presented as profile plans for the EM data that were generated for individual real (In-Phase) and imaginary parts (Quadrature) of the Tzx and Tzy components. Colour contour maps of the corresponding DT (Total Divergence) or TPR (Total Phase Rotated) grids for three of the six frequencies, (30, 45, 90, 180, 360 and 720Hz), as well as for corresponding Phase Rotated Grids for individual components.

3D views have been constructed by plotting the either DT or TPR grids at their respective penetration depths using a 1000 ohm-m half space, using the Bostick skin depth rule (Bostick, 1977) see Appendix D.

Final maps were chosen, in consultation with the client, to represent all collected data, are listed in Section 5.3.

Sample maps of the related 3D view, Magnetic and Total Phase Rotated are included in this report and presented in Appendix C.

5.3 Digital Data

- Two copies of the data and maps on 2 DVDs were prepared to accompany the report. Each DVD contains a digital file of the line data in GDB Geosoft Montaj.

- DVD structure.

  There are two (2) main directories;

Data	contains databases and grids, as described below.
Report	contains a copy of the report and appendices in PDF format.

  Databases in Geosoft GDB format, containing the channels listed in Table 4.

Table 4 - Geosoft GDB Data Format

Column	Description
X:	UTM Easting WGS84 Zone 17N, (Centre of the ZTEM loop) (meters)
Y:	UTM Northing WGS84 Zone 17N , (Centre of the ZTEM loop) (meters)
Longitude:	Longitude – WGS84 (Centre of the ZTEM loop) (Decimal degree)
Latitude	Latitude – WGS84 (Centre of the ZTEM loop) (Decimal degree)
Z:	Elevation- WGS84 (Centre of the ZTEM loop) (metres)
Radar:	Helicopter terrain clearance from radar altimeter (metres - AGL)
Radar_B:	Calculated ZTEM Bird terrain clearance (metres)
DEM	Digital Elevation Model (meters)
Gtime	GPS Time (seconds)
basemag	Base station mag
Mag1	Measured Total Magnetic Intensity, raw (de-spiked)
Mag2	Measured Total Magnetic Intensity, diurnal corrected
Mag3:	Levelled Total Magnetic field data
xIp_030Hz:	Tzx In-Phase 30 Hz final corrected
xIp_045Hz:	Tzx In-Phase 45 Hz final corrected
xIp_090Hz:	Tzx In-Phase 90 Hz final corrected
xIp_180Hz:	Tzx In-Phase 180 Hz final corrected
xIp_360Hz:	Tzx In-Phase 360 Hz final corrected
xIp_720Hz:	Tzx In-Phase 720 Hz final corrected
xQd_030Hz:	Tzx Quadrature 30 Hz final corrected
xQd_045Hz:	Tzx Quadrature 45 Hz final corrected
xQd_090Hz:	Tzx Quadrature 90 Hz final corrected
xQd_180Hz:	Tzx Quadrature 180 Hz final corrected
xQd_360Hz:	Tzx Quadrature 360 Hz final corrected
xQd_720Hz:	Tzx Quadrature 720 Hz final corrected
yIp_030Hz:	Tzy In-Phase 30 Hz final corrected
yIp_045Hz:	Tzy In-Phase 45 Hz final corrected
yIp_090Hz:	Tzy In-Phase 90 Hz final corrected
yIp_180Hz:	Tzy In-Phase 180 Hz final corrected
yIp_360Hz:	Tzy In-Phase 360 Hz final corrected
yIp_720Hz:	Tzy In-Phase 720 Hz final corrected
yQd_030Hz:	Tzy Quadrature 30 Hz final corrected
yQd_045Hz:	Tzy Quadrature 45 Hz final corrected
yQd_090Hz:	Tzy Quadrature 90 Hz final corrected
yQd_180Hz:	Tzy Quadrature 180 Hz final corrected
yQd_360Hz:	Tzy Quadrature 360 Hz final corrected
yQd_720Hz:	Tzy Quadrature 720 Hz final corrected
PLM:	Power Line Monitor (60Hz)

- Grids in Geosoft GRD format, as follows:

MAG:	Total Magnetic Intensity
DEM:	Digital Elevation Model
PLM:	Power Line Monitor
XIP_30Hz_PR:	Tzx In-Phase Component Phase Rotated grid at 30 Hz
XIP_45Hz_PR:	Tzx In-Phase Component Phase Rotated grid at 45 Hz
XIP_90Hz_PR:	Tzx In-Phase Component Phase Rotated grid at 90 Hz
XIP_180Hz_PR:	Tzx In-Phase Component Phase Rotated grid at 180 Hz
XIP_360Hz_PR:	Tzx In-Phase Component Phase Rotated grid at 360 Hz
XIP_720Hz_PR:	Tzx In-Phase Component Phase Rotated grid at 720 Hz
XQd_30Hz_PR:	Tzx Quadrature component Phase Rotated grid at 30 Hz
XQd_45Hz_PR:	Tzx Quadrature component Phase Rotated grid at 45 Hz
XQd_90Hz_PR:	Tzx Quadrature component Phase Rotated grid at 90 Hz
XQd_180Hz_PR:	Tzx Quadrature component Phase Rotated grid at 180 Hz
XQd_360Hz_PR:	Tzx Quadrature component Phase Rotated grid at 360 Hz
XQd_720Hz_PR:	Tzx Quadrature component Phase Rotated grid at 720 Hz
YIP_30Hz_PR:	Tzy In-Phase Component Phase Rotated grid at 30 Hz
YIP_45Hz_PR:	Tzy In-Phase Component Phase Rotated grid at 45 Hz
YIP_90Hz_PR:	Tzy In-Phase Component Phase Rotated grid at 90 Hz
YIP_180Hz_PR:	Tzy In-Phase Component Phase Rotated grid at 180 Hz
YIP_360Hz_PR:	Tzy In-Phase Component Phase Rotated grid at 360 Hz
YIP_720Hz_PR:	Tzy In-Phase Component Phase Rotated grid at 720 Hz
YQd_30Hz_PR:	Tzy Quadrature component Phase Rotated grid at 30 Hz
YQd_45Hz_PR:	Tzy Quadrature component Phase Rotated grid at 45 Hz
YQd_90Hz_PR:	Tzy Quadrature component Phase Rotated grid at 90 Hz
YQd_180Hz_PR:	Tzy Quadrature component Phase Rotated grid at 180 Hz
YQd_360Hz_PR:	Tzy Quadrature component Phase Rotated grid at 360 Hz
YQd_720Hz_PR:	Tzy Quadrature component Phase Rotated grid at 720 Hz
XIP_30Hz:	Tzx In-Phase Component grid at 30 Hz
XIP_45Hz:	Tzx In-Phase Component grid at 45 Hz
XIP_90Hz:	Tzx In-Phase Component grid at 90 Hz
XIP_180Hz:	Tzx In-Phase Component grid at 180 Hz
XIP_360Hz:	Tzx In-Phase Component grid at 360 Hz
XIP_720Hz:	Tzx In-Phase Component grid at 720 Hz
XQd_30Hz:	Tzx Quadrature component grid at 30 Hz
XQd_45Hz:	Tzx Quadrature component grid at 45 Hz
XQd_90Hz:	Tzx Quadrature component grid at 90 Hz
XQd_180Hz:	Tzx Quadrature component grid at 180 Hz
XQd_360Hz:	Tzx Quadrature component grid at 360 Hz
XQd_720Hz:	Tzx Quadrature component grid at 720 Hz
YIP_30Hz:	Tzy In-Phase Component grid at 30 Hz
YIP_45Hz:	Tzy In-Phase Component grid at 45 Hz
YIP_90Hz:	Tzy In-Phase Component grid at 90 Hz
YIP_180Hz:	Tzy In-Phase Component grid at 180 Hz
YIP_360Hz:	Tzy In-Phase Component grid at 360 Hz

YIP_720Hz: Tzy In-Phase Component grid at 720 Hz
YQd_30Hz: Tzy Quadrature component grid at 30 Hz
YQd_45Hz: Tzy Quadrature component grid at 45 Hz
YQd_90Hz: Tzy Quadrature component grid at 90 Hz
YQd_180Hz: Tzy Quadrature component grid at 180 Hz
YQd_360Hz: Tzy Quadrature component grid at 360 Hz
YQd_720Hz: Tzy Quadrature component grid at 720 Hz
IP_30Hz_DT: Total Divergence grid from In-phase components at 30 Hz
IP_45Hz_DT: Total Divergence grid from In-phase components at 45 Hz
IP_90Hz_DT: Total Divergence grid from In-phase components at 90 Hz
IP_180Hz_DT: Total Divergence grid from In-phase components at 180 Hz
IP_360Hz_DT: Total Divergence grid from In-phase components at 360 Hz
IP_720Hz_DT: Total Divergence grid from In-phase components at 720 Hz
QD_30Hz_DT: Total Divergence grid from Quadrature components at 30 Hz
QD_45Hz_DT: Total Divergence grid from Quadrature components at 45 Hz
QD_90Hz_DT: Total Divergence grid from Quadrature components at 90 Hz
QD_180Hz_DT: Total Divergence grid from Quadrature components at 180 Hz
QD_360Hz_DT: Total Divergence grid from Quadrature components at 360 Hz
QD_720Hz_DT: Total Divergence grid from Quadrature components at 720 Hz
IP_30Hz_TPR: Total Phase Rotated grid from In-phase components at 30 Hz
IP_45Hz_TPR: Total Phase Rotated grid from In-phase components at 45 Hz
IP_90Hz_TPR: Total Phase Rotated grid from In-phase components at 90 Hz
IP_180Hz_TPR: Total Phase Rotated grid from In-phase components at 180 Hz
IP_360Hz_TPR: Total Phase Rotated grid from In-phase components at 360 Hz
IP_720Hz_TPR: Total Phase Rotated grid from In-phase components at 720 Hz
QD_30Hz_TPR: Total Phase Rotated grid from Quadrature components at 30 Hz
QD_45Hz_TPR: Total Phase Rotated grid from Quadrature components at 45 Hz
QD_90Hz_TPR: Total Phase Rotated grid from Quadrature components at 90 Hz
QD_180Hz_TPR: Total Phase Rotated grid from Quadrature components at 180 Hz
QD_360Hz_TPR: Total Phase Rotated grid from Quadrature components at 360 Hz
QD_720Hz_TPR: Total Phase Rotated grid from Quadrature components at 720 Hz

A Geosoft .GRD file has a .GI metadata file associated with it, containing grid projection information. A grid cell size of 50 metres was used.

- Maps at 1:20,000 scale in Geosoft MAP format, as follows:

11118_20K_3D_IP_TPR: 3D view of In-Phase Total Phase Rotated versus Skin Depth (30-720Hz)
11118_20K_TMI: Total Magnetic Intensity (TMI)
11118_20K_30Hz_IP_DT: 30Hz In-Phase Total Divergence Grid
11118_20K_90Hz_IP_DT: 90Hz In-Phase Total Divergence Grid
11118_20K_360Hz_IP_DT: 360Hz In-Phase Total Divergence Grid
11118_20K_XIP_profiles_XIP_PR: Tzx (In-line) In-Phase Profiles over 90Hz Phase Rotated In-Phase Grid

11118_20K_XQD_profiles_XQD_PR: Tzx (In-line) Quadrature Profiles over a 90Hz Phase Rotated Quadrature Grid.
11118_20K_YIP_profiles_YIP_PR: Tzy (Cross-line) In-Phase Profiles over 90Hz Phase Rotated In-Phase Grid
11118_20K_YQD_profiles_YQD_PR: Tzy (Cross-line) Quadrature Profiles over a 90Hz Phase Rotated Quadrature Grid.

- 2D Resistivity Inversion maps:

  A complete list of all 42 inversions is in Appendix F.

- Maps are also presented in PDF format.

- 1:50,000 topographic vectors were taken from the NRCAN Geogratis database at; http://geogratis.gc.ca/geogratis/en/index.html.

- A Google Earth file *"11118_Sanatana.kml"* is included, showing the flight path of each block. Free versions of Google Earth software from: http://earth.google.com/download-earth.html.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

A helicopter-borne ZTEM and aeromagnetic geophysical survey has been completed over the Watershed block located near Gogama, Ontario.

The total area coverage is 78 km^2. Total survey line coverage is 641 line kilometres. The principal sensors included a Z-Axis Tipper electromagnetic (ZTEM) system and a caesium magnetometer. Results have been presented as stacked profiles and contour colour images at a scale of 1:20,000.

There is no summary interpretation included in this report however, 2 2D inversions have been provided in Appendix F.

6.2 Recommendations

Based on the geophysical results obtained, a number of interesting conductive structures were identified across the property. The magnetic results also contain worthwhile information in support of exploration targets of interest. We therefore recommend a more detailed interpretation of the available geophysical data, including 2D and 3D inversions, in conjunction with the geology, prior to ground follow up and drill testing.

Respectfully submitted[6],

Nick Venter
Geotech Ltd.

Jean Legault, P. Geo, P. Eng
Geotech Ltd.

Shengkai Zhao
Geotech Ltd.

Lily Manoukian
Geotech Ltd.

May 2011

[6] Final data processing of the EM and magnetic data were carried out by Nick Venter and Lily Manoukian and 2Dinversions were carried out by Shengkai Zhao from the office of Geotech Ltd. in Aurora, Ontario, under the supervision of Jean Legault, P. Geo, P. Eng, Chief Geophysicist (Interpretation)

7. REFERENCES AND SELECTED BIBLIOGRAPHY

Anav, A., Cantarano, S., Cerruli-Irelli, P., and Pallotino, G.V.(1976). A correlation method for measurement of variable magnetic fields: *Inst. Elect. and Electron. Eng. Trans., Geosc. Elect.* GE14, 106-114.

Bostick, F.X. (1977). A Simple almost exact method of MT analysis, Proceedings of the University of Utah Workshop on Electrical Methods in Geothermal Exploration, 175-188.

De Lugao, P.P.,and Wannamaker, P.E.(1996). Calculating the two-dimensional magnetotelluric Jacodian in finite elements using reciprocity: Geophys. J. Int., **127**, 806-810

Karous, M.R., and S. E. Hjelt (1983). Linear filtering of VLF dip-angle measurements: *Geophysical Prospecting*, **31**, 782-794.

Kuzmin, P., Lo, B. and Morrison, E. (2005). Final Report on Modeling, interpretation methods and field trials of an existing prototype AFMAG system, Miscellaneous Data Release 167, Ontario Geological Survey, 2005.

Labson, V. F., Becker A., Morrison, H. F., and Conti, U. (1985). Geophysical exploration with audiofrequency natural magnetic fields. *Geophysics*, **50**, 656-664.

Legault, J.M., Kumar, H., Milicevic, B., and Hulbert, L. (2009), ZTEM airborne tipper AFMAG test survey over a magmatic copper-nickel target at Axis Lake in northern Saskatchewan, SEG Expanded Abstracts, **28**, 1272-1276

Legault, J.M., Kumar, H., Milicevic, B., and Wannamaker, P.,(2009), ZTEM tipper AFMAG and 2D inversion results over an unconformity uranium target in northern Saskatchewan, SEG Expanded Abstracts, **28**, 1277-1281.

Lo, B., Legault, J.M., Kuzmin, P. and Combrick, M. (2009). ZTEM (Airborne AFMAG) tests over unconformity uranium deposits, Extended abstract submitted to 20th ASEG International Conference and Exhibition, Adelaide, AU, 4pp.

Lo, B., and Zang, M., (2008), Numerical modeling of Z-TEM (airborne AFMAG) responses to guide exploration strategies, SEG Expanded Abstracts, **27**, 1098-1101.

Milicevic, B. (2007). Report on a helicopter borne Z-axis, Tipper electromagnetic (ZTEM) and magnetic survey at Safford, Giant Hills, Baldy Mountains and Sierrita South Areas, Arizona, USA., Geotech internal survey report (job A226), 33pp.

Pedersen, L.B., Qian, W., Dynesius, L. and Zhang, P. (1994). An airborne sensor VLF system. From concept to realization. *Geophysical Prospecting*, **42**, i.8, 863-883

Peterson, L.B. (1998). Tensor VLF measurements: first experiences, *Exploration Geophysics*, **29**, 52-57.

Strangway, D. W., Swift Jr., C. M., and Holmer, R. C. (1973). The Application of Audio-Frequency Magnetotellurics (AMT) to Mineral Exploration. *Geophysics*, **38**, 1159-1175.

Tarantola, A.,(1987) Inverse problem theory: Elsevier, New York, 613 pp.

Vozoff, K.(1972). The magnetotelluric method in the exploration of sedimentary basins. *Geophysics*, **37**, 98-141.

Vozoff, K. (1991). The magnetotelluric method. In: Electromagnetic Methods in Applied Geophysics - Volume 2 Applications, edited by Nabighian, M.N., Society of Exploration Geophysicists, Tulsa., 641-711.

Ward, S. H. (1959). AFMAG - Airborne and Ground. *Geophysics*, **24**, 761-787.

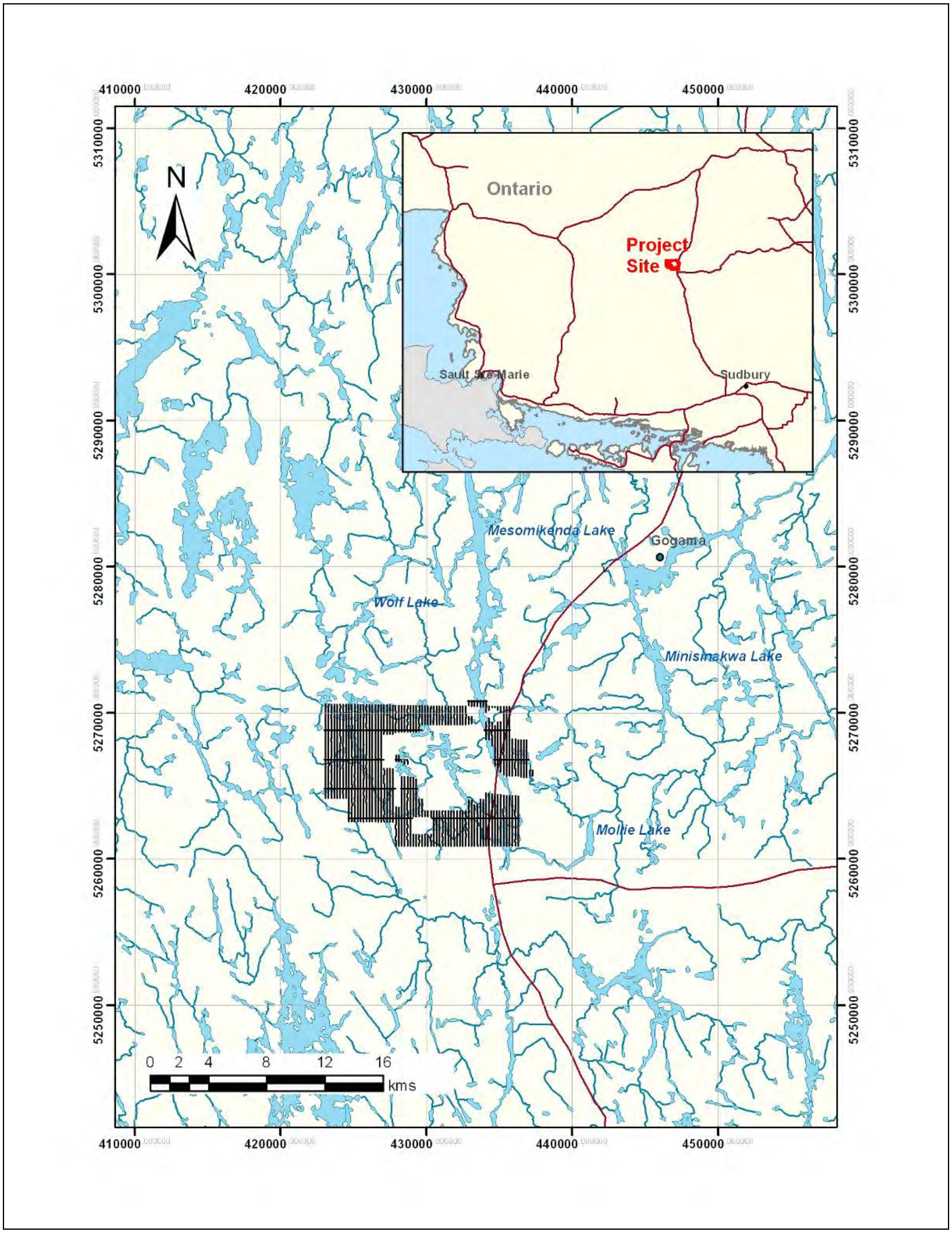
Ward, S. H, O'Brien, D.P., Parry, J.R. and McKnight, B.K. (1968). AFMAG Interpretation. *Geophysics*, **33**, 621-644.

Wannamaker, P.E., Stodt, J.A., and Rijo, L., (1987). A stable finite element solution for two-dimentional magnetotelluric modeling: Geophy. J. Roy. Astr. Soc.,**88**, 277-296.

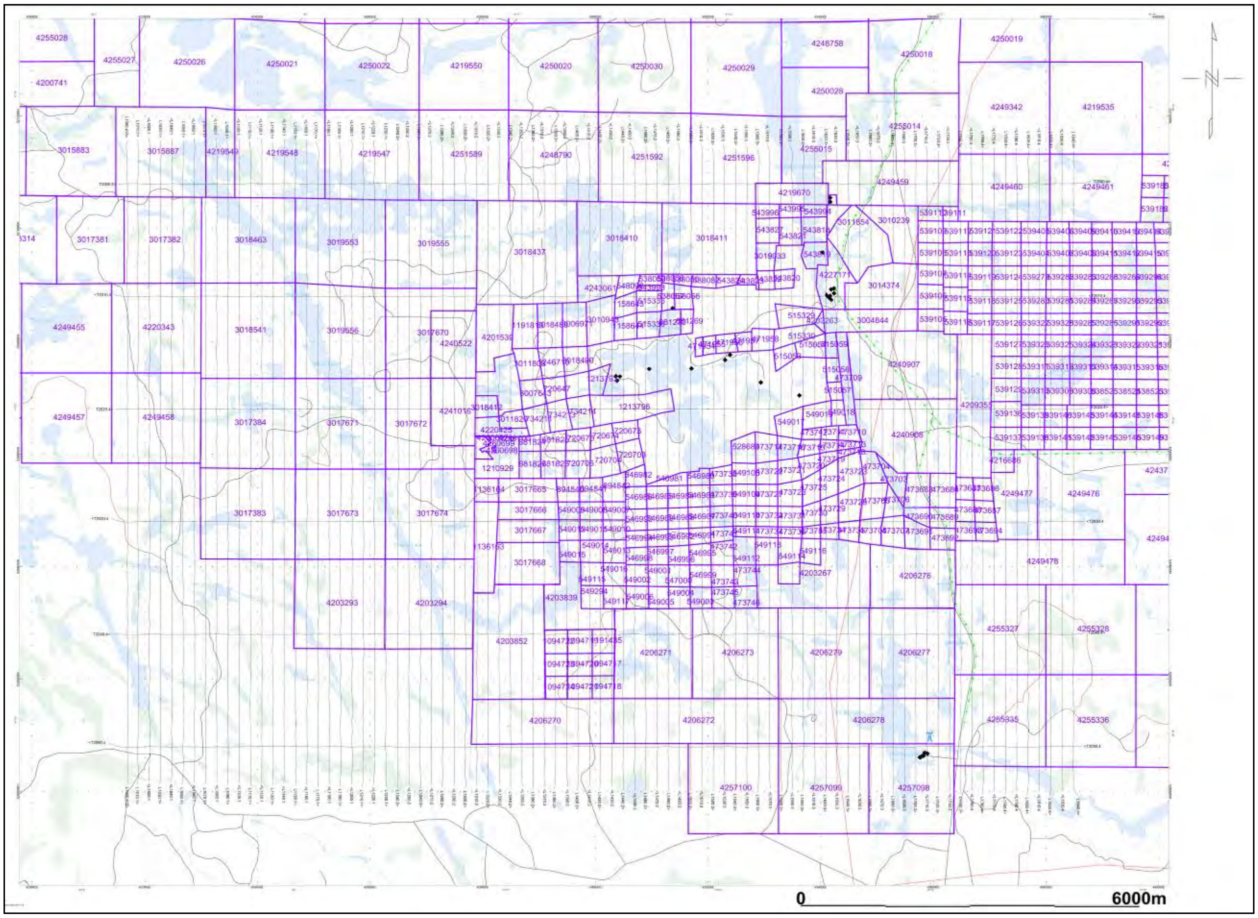
Zhang, P. and King, A. (1998). Using magnetotellurics for mineral exploration, Extended Abstracts from 1998 Meeting of Society of Exploration Geophysics

APPENDIX A

SURVEY BLOCK LOCATION MAP



Survey Overview Location Map



Mining Claims for the Block

APPENDIX B

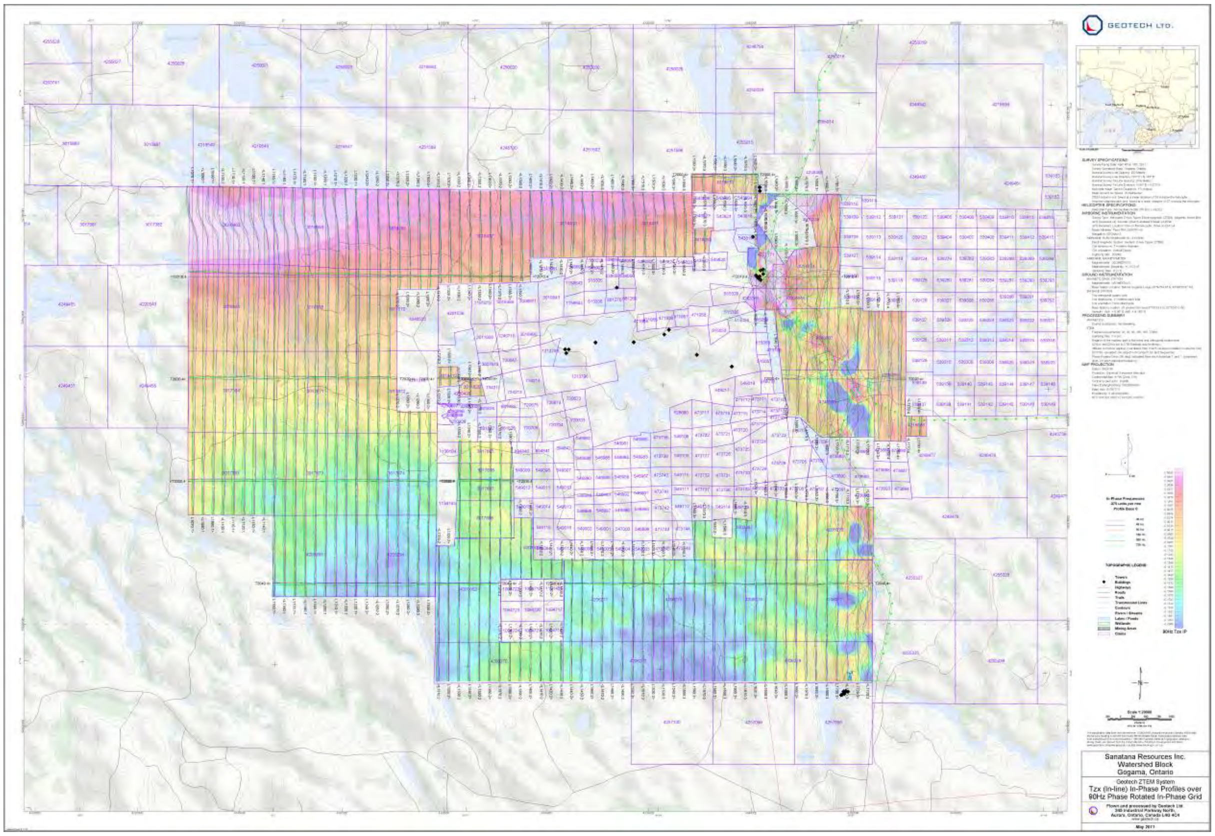
SURVEY BLOCK COORDINATES
(WGS84 Zone 17N)

X	Y
422990.9	5270583
426259.6	5270527
432834.4	5270433
432815.6	5270827
434130.6	5270827
434130.6	5270433
435708.5	5270414
435727.3	5268216
436178.2	5268197
436178.2	5268141
437042.3	5268141
437023.5	5266075
437418	5266075
437436.8	5265680
437042.3	5265699
437042.3	5265568
436384.8	5265586
436403.6	5265661
435370.4	5265661
434957.1	5266075
434694.1	5266093
434731.7	5266225
434600.2	5266657
434581.4	5267033
434431.2	5268141
434111.8	5268160
433886.4	5268291
434017.9	5268554
433923.9	5269024
433942.7	5269400
434111.8	5269343
434093	5269888
434093	5270395
432853.2	5270470
432872	5269738
433266.5	5269757
433153.8	5269268
432872	5269231
432872	5269174
431162.5	5269193

Con't	
429678.5	5269174
429678.5	5268705
427875.1	5268667
427875.1	5268554
427067.3	5268554
427086.1	5266187
427856.3	5266150
427856.3	5263539
428138.1	5263539
428232	5263689
428250.8	5265605
429284	5265586
429377.9	5264948
429340.4	5264102
429734.8	5264065
429753.6	5263294
432872	5263276
432834.4	5264027
433228.9	5264027
433247.7	5263708
433623.4	5263689
433604.6	5264102
433961.5	5264046
433999.1	5264497
435558.3	5264328
436403.6	5264290
436347.2	5260890
427800	5260871
427800	5262524
424644	5262543
424662.8	5264140
422972.2	5264140
423009.7	5270564
427871.9	5267052
428253.9	5267052
428285.1	5266694
428339.6	5266694
428394.2	5266772
428690.4	5266811

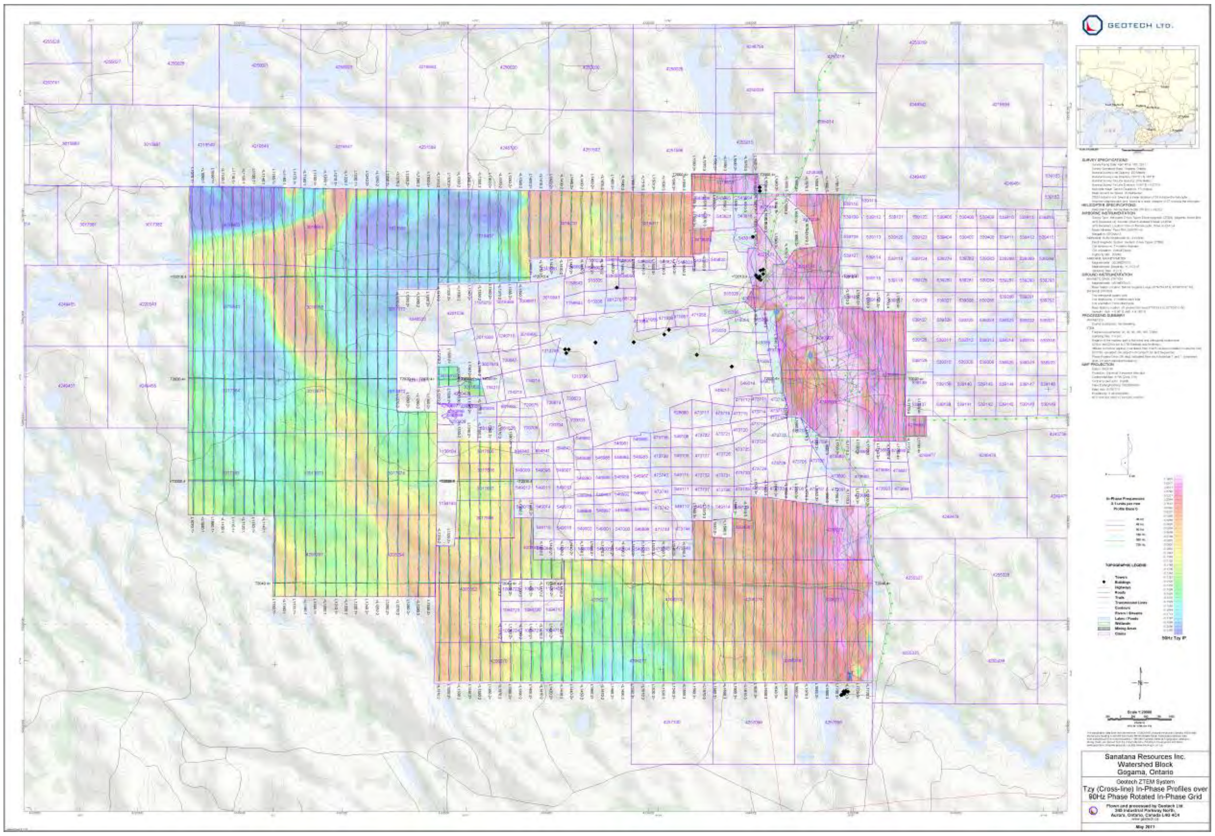
Con't	
428799.5	5266460
428534.5	5266460
428300.6	5266460
428285.1	5266670
427856.3	5266647
427856.3	5267060
429081.7	5262892
430329.4	5262873
430329.4	5261700
430143.1	5261663
429081.7	5261663
429063.1	5262892
434108	5269854
434290.3	5270178
434533.4	5270411
434634.7	5270421
435181.7	5269895
435272.9	5269398
434827.2	5269338
434644.9	5269044
434260	5269672
434108	5269864

APPENDIX C
GEOPHYSICAL MAPS[1]

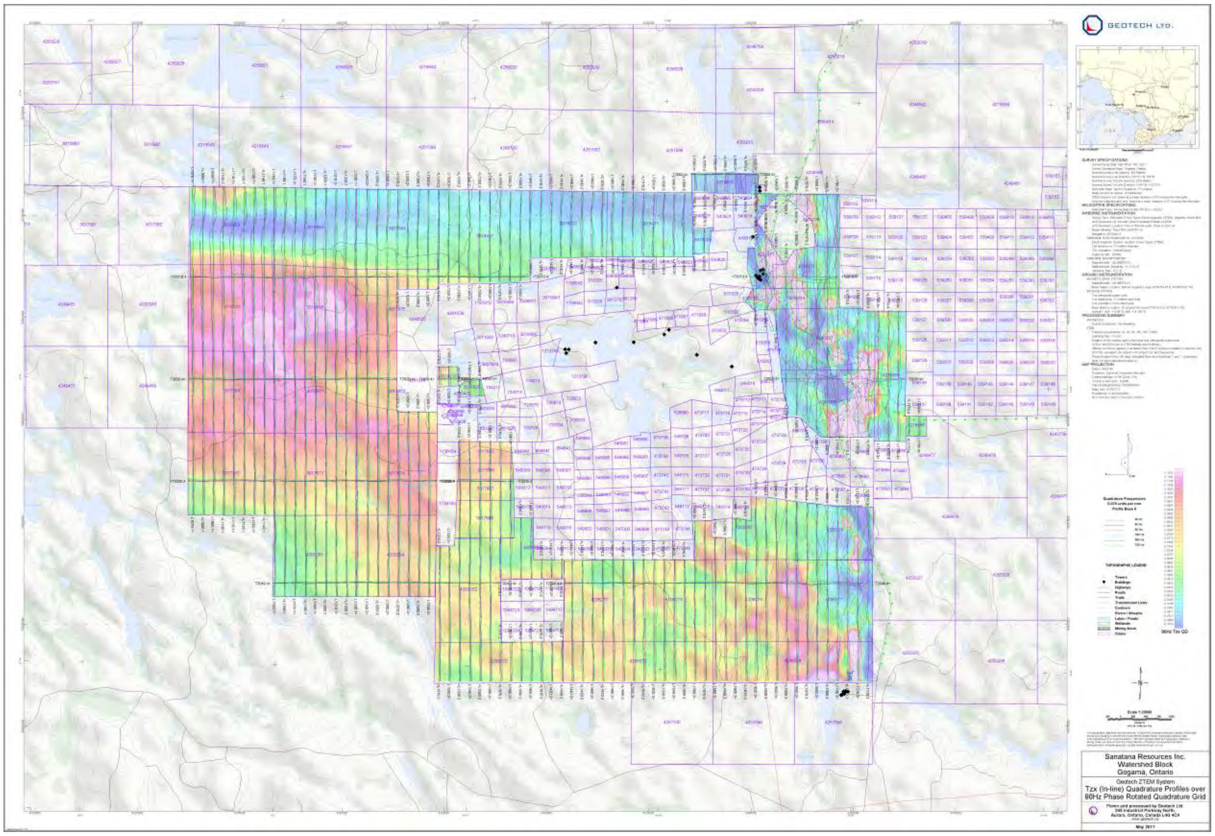


Tzx (In-line) In-Phase Profiles over 90Hz Rotated Tzx In-Phase Grid

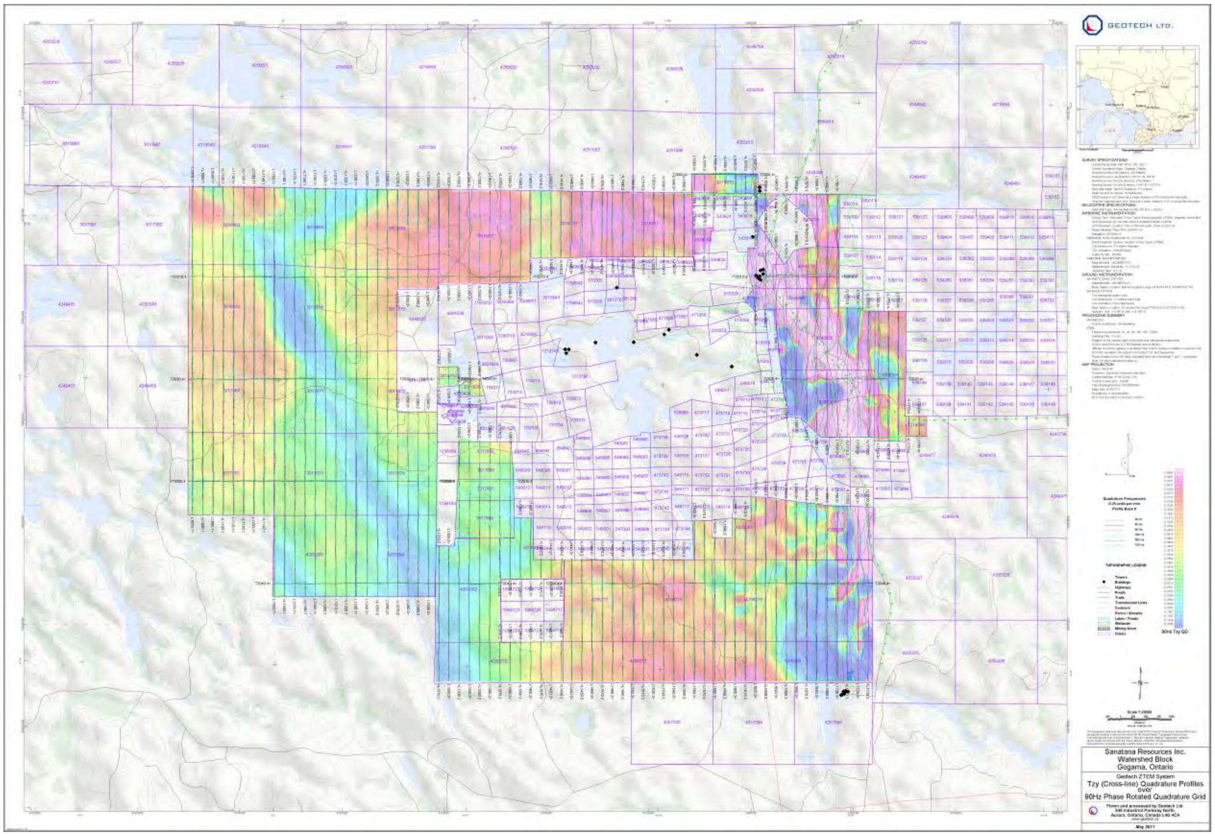
[1] Full size geophysical maps are also available in PDF format on the final DVD



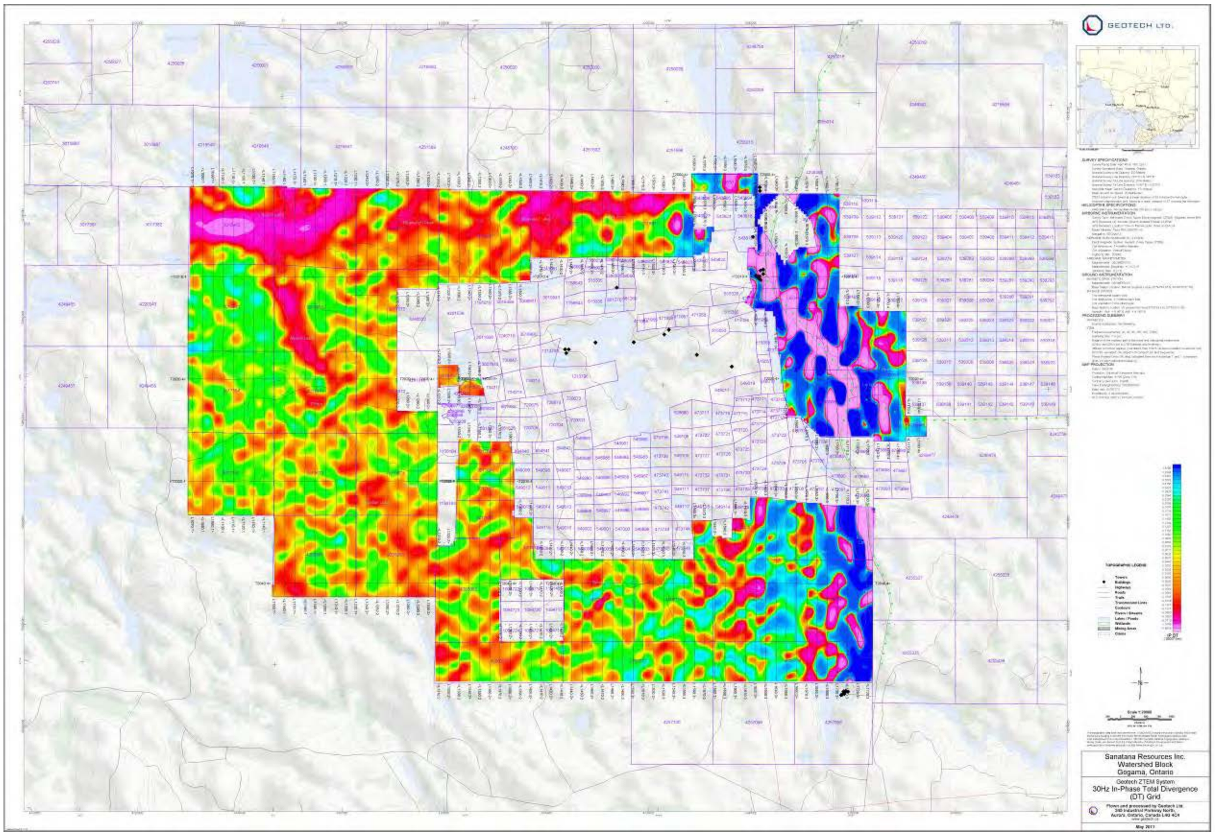
Tzy (Cross-line) In-Phase Profiles over 90Hz Rotated Tzy In-Phase Grid



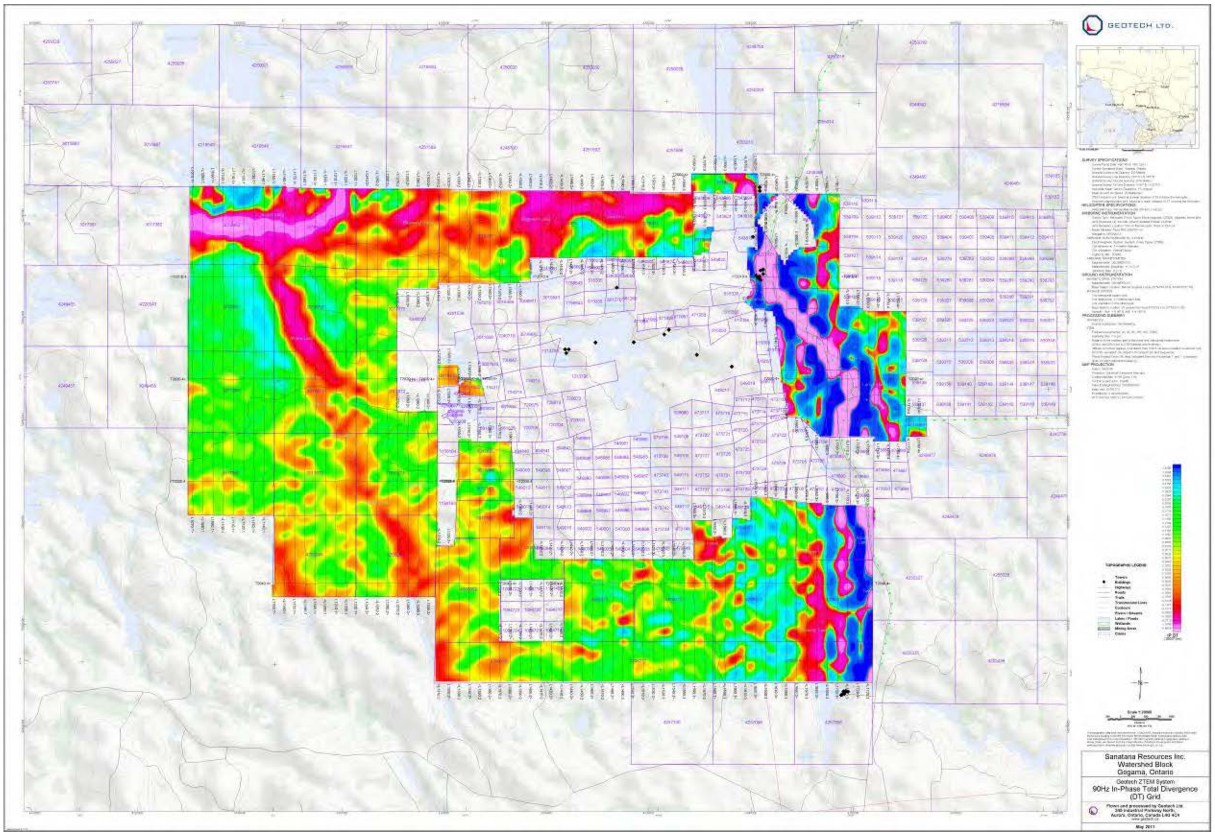
Tzx (In-line) Quadrature Profiles over 90Hz Rotated Tzx Quadrature Grid



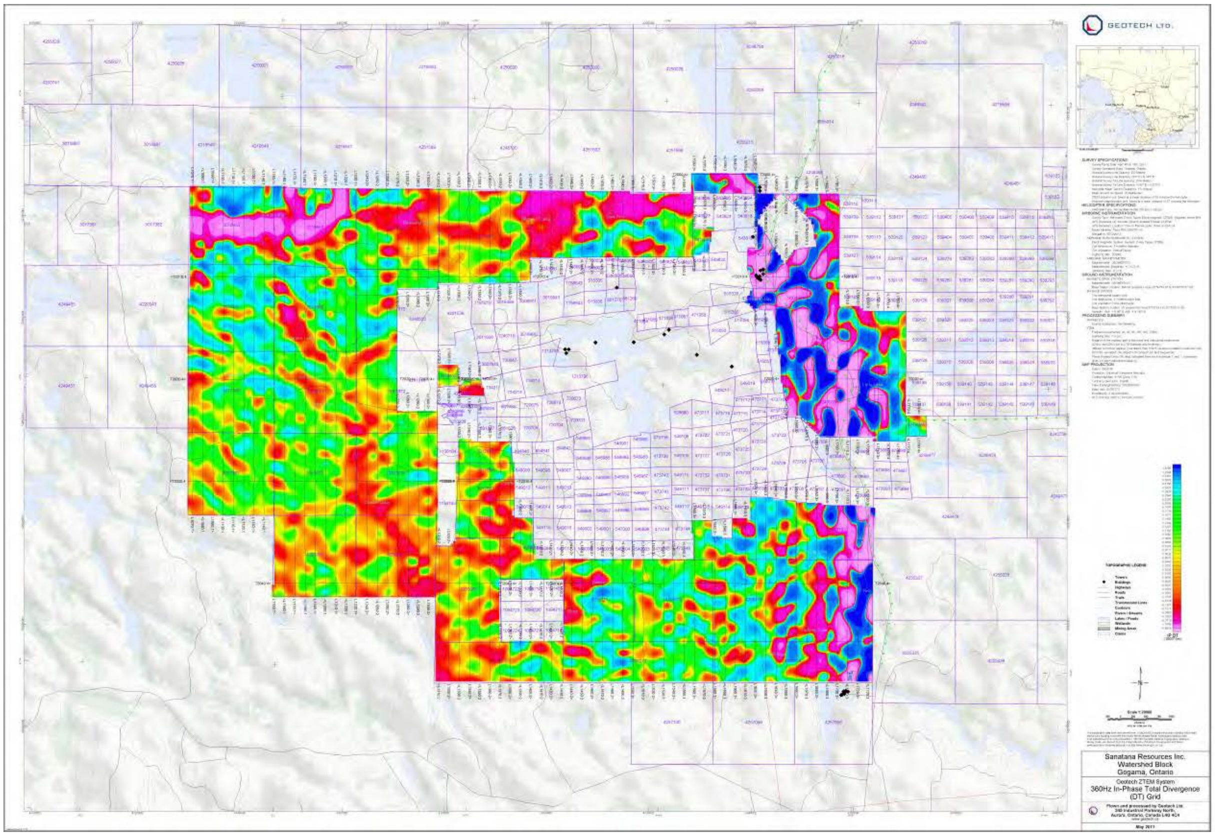
Tzy (Cross-line) Quadrature Profiles over 90Hz Rotated Tzy Quadrature Grid



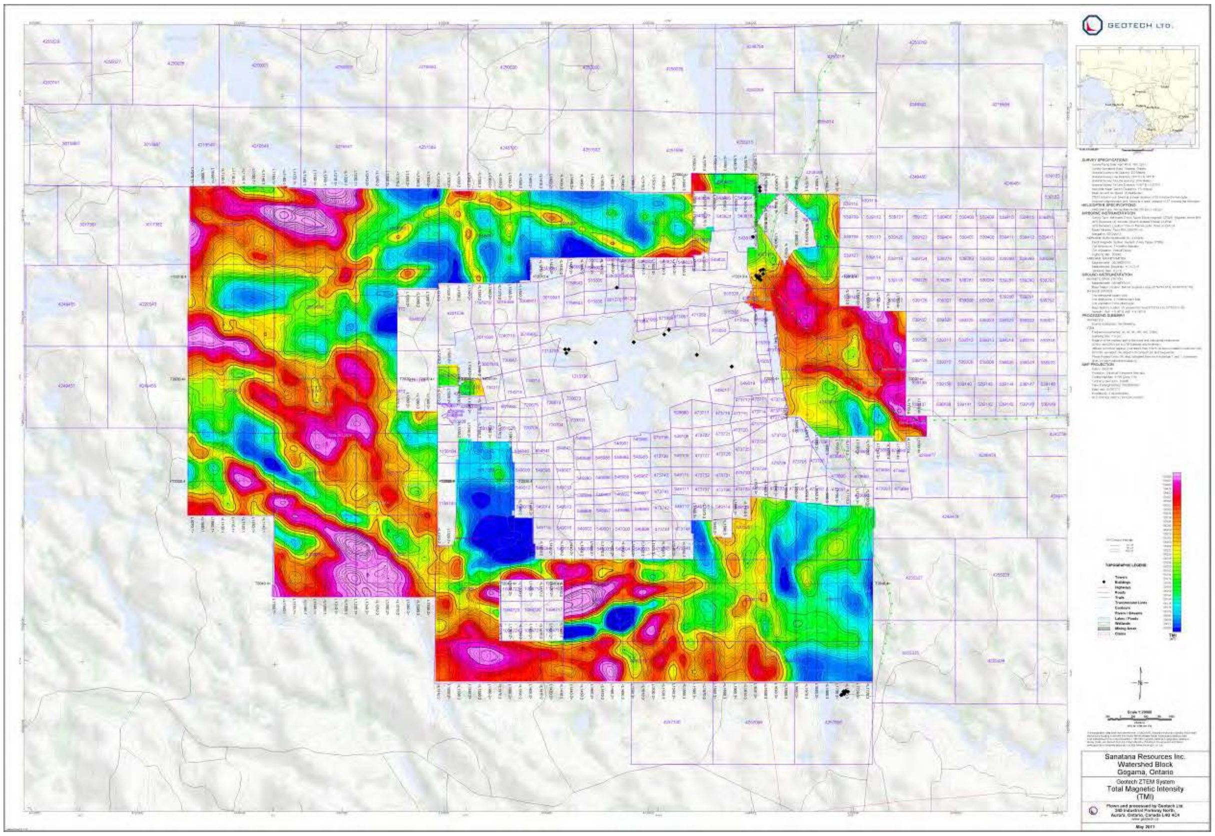
30Hz Total Divergence In-Phase (DT) Grid



90Hz Total Divergence In-Phase (DT) Grid



360Hz Total Divergence In-Phase (DT) Grid



Total Magnetic Intensity (TMI)

APPENDIX D

ZTEM THEORETICAL CONSIDERATIONS

A brief section on the theory behind the AFMAG technique is provided for completeness and a more comprehensive development of the theory can be found in standard texts. The natural EM field is normally horizontally polarized. Subsurface lateral variations of conductivity generate a vertical component, which is linearly related to the horizontal field. Although the fields look like random signals, they may be treated as the sum of sinusoids. At each frequency the field can be expressed as a complex number with magnitude and argument equal to the amplitude and phase of the sinusoid. The relation between the field components can then be expressed by a linear complex equation with two complex coefficients at any one frequency. These coefficients are dependent upon the subsurface and not upon the horizontal field present at any particular time and are appropriate parameters to measure (Vozoff, 1972).

$$Hz(f) = Tx(f)\, Hx(f) + Ty(f)\, Hy(f), \qquad (1)$$

Where

Hx(f), Hy(f) and Hz(f) are x, y and z components of the field,

Tx(f) and Ty(f) are the "tipper" coefficients.

In the case of a horizontally homogeneous environment, Tx and Ty are equal to zero because Hz =0. They show certain anomalies only by the presence of changes in subsurface conductivity in the horizontal direction. The real parts of the coefficients correspond to tangents of tilt angles measured with a controlled source. The complex tensor [Tx, Ty] known as the "tipper" defines the vertical response to horizontal fields in the x and y directions respectively.

Tx and Ty are two unknown coefficients in one equation, and we therefore must combine two or more sets of measurements to solve them. To reduce effects of noise, multiple sets of measurements can be made, and the coefficients, which minimize the squared error in predicting the measured Z from X and Y, can be found. This leads to next formulas for estimating the coefficients.

$$Tx = ([HzHx^*]\,[HyHy^*] - [HzHy^*]\,[HyHx^*]) \,/\, ([HxHx^*]\,[HyHy^*] - [HxHy^*]\,[HyHx^*]), \qquad (2)$$

and

$$Ty = ([HzHy^*]\,[HxHx^*] - [HzHx^*]\,[HxHy^*]) \,/\, ([HxHx^*]\,[HyHy^*] - [HxHy^*]\,[HyHx^*] . \qquad (3)$$

Where

[HxHy*] (For example) denotes a sum of the product of Hx with the complex conjugate of Hy.

In practical processing algorithms, all numbers Hx, Hy and Hz can be obtained by applying the same digital band-pass filters to three incoming parallel data signals. FFT algorithms are also applicable. All sums like [HxHy*] can be calculated on the basis of a discrete time interval in the range from 0.1 to 1 sec or on a sliding time base.

Using platform attitude data in the EM data processing can be done at different stages of the signal processing. The most obvious idea is to transform parallel data from local coordinates of the platform into absolute geographical coordinates before the main signal processing procedure. Unfortunately, the proper algorithms of attitude data obtained, often require some post-processing algorithms such as using post-calculated accelerations based on GPS data etc. That is why it is preferable to treat x-y-z coordinates in formulas above in the local coordinate system of the platform and to recalculate resulting local tilt angles into a geographical or global coordinate system later, during the data post processing.

In weak field conditions where the level of the signal is comparable with input noise levels in preamplifiers, the bias in the estimated values of Tx and Ty caused by noise in the horizontal signals become substantial and can not be reduced by any averaging. This bias can be removed by the use of separate reference signals containing noise uncorrelated with noise in signals Hx and Hy. (Anav et al., 1976).

$$Tx = ([HzRx^*]\,[HyRy^*] - [HzRy^*]\,[HyRx^*]) / ([HxRx^*]\,[HyRy^*] - [HxRy^*]\,[HyRx^*]), \quad (4)$$

and

$$Ty = ([HzRy^*]\,[HxRx^*] - [HzRx^*]\,[HxRy^*]) / ([HxRx^*]\,[HyRy^*] - [HxRy^*]\,[HyRx^*]). \quad (5)$$

Where:

Rx is the reference field x component,
Ry is the reference field y component.

An additional two electromagnetic sensors, providing these reference signals can be placed at some distance away from the main x, y and z sensors. Currently, though, no additional remote-reference processing are applied to ZTEM data.

Numerical Modelling

In order to understand the airborne AFMAG responses to conductors for a variety of geological environments, EMIGMA^{TM} modelling code from PetRos EiKon (Toronto, ON) was obtained to conduct the formulated model studies.

Below are some of the modelling results from their study.

Modelling assumption:

The assumptions for the modelling are that:

3 components of the magnetic field are measured and they are processed according to:

$$Hz(f) = Tx(f)\,Hx(f) + Ty(f)\,Hy(f)$$

The vector (Tx,Ty) is usually referred to as the 'tipper' vector and is determined in the frequency domain through processing. This is normally done by determining transfer functions from an extended time series.

For the modelling exercise, the 3 components of the magnetic vector (Hx,Hy,and Hz) are modelled twice for 2 orthogonal polarizations of a plane wave source field and then the tipper is calculated from a matrix calculation using the results of the 2 source polarizations' models. For the 2D forward modelling results, the tipper vectors are shown as a function of frequency

Basic Model Response

For the initial models, we assume a thin plate-like model. The model is perpendicular to the flight direction. Initially, we will assume very long strike directions. From this quasi-2D model, there are 2 basic responses. The so-called TE response and the so-called TM response.

For the initial models, we will assume the strike is in the y (North) directions and the flight is in the x (East) direction Sensor heights are 30m above ground.

TE Mode: For the TE response, the electric field excitation flows along strike (current channelling) and the horizontal H field (Hx) flows perpendicular to strike thus causing induction through Faraday's law. The Hz response is generated both from channelling and induction.

TM Mode: For this response, the electric field excitation flows perpendicular to strike generating quasi-static charges on faces and the horizontal H field (Hx) flows parallel to strike. Since, the XZ face is very small for this model, little current is induced. The charges on the faces have a small dipole moment due to the thinness of the model.

For the rest of the models unless otherwise noted, the parameters used are:

Strike Length: 1km
Depth Extent: 1km
Conductance: 100S
Depth to Top: 10m
Background: Thin-overburden (10m), Resistive Basement (1000 Ohm-m)

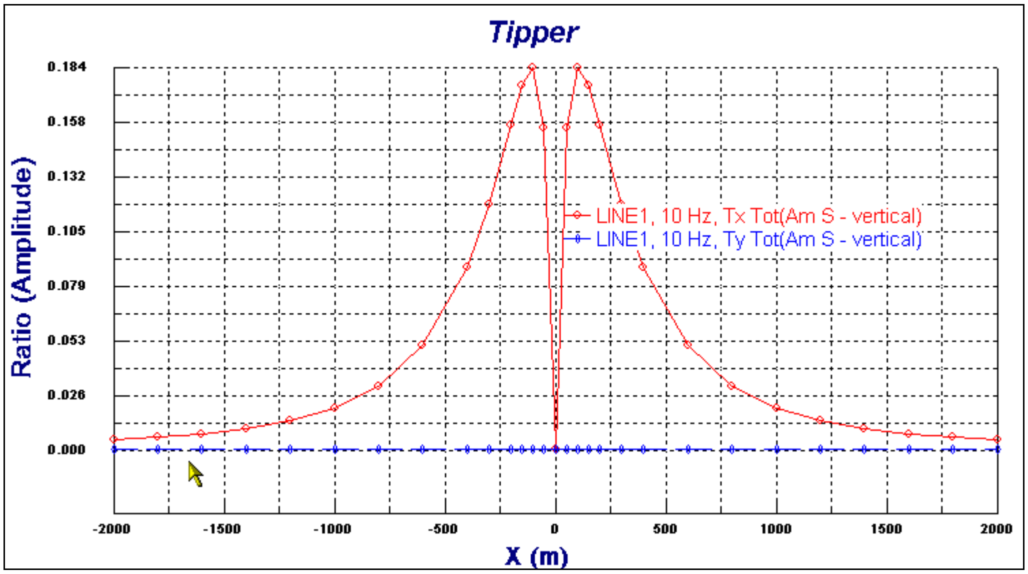


Figure D-1 – Calculated Tipper components at 10 Hz for above model parameters.

Figure D1 shows the Tipper (Tx,Ty) Amplitudes at 10Hz using a10Ωm overburden. Note small Ty (ie quasi-TM response)

Amplitude Response

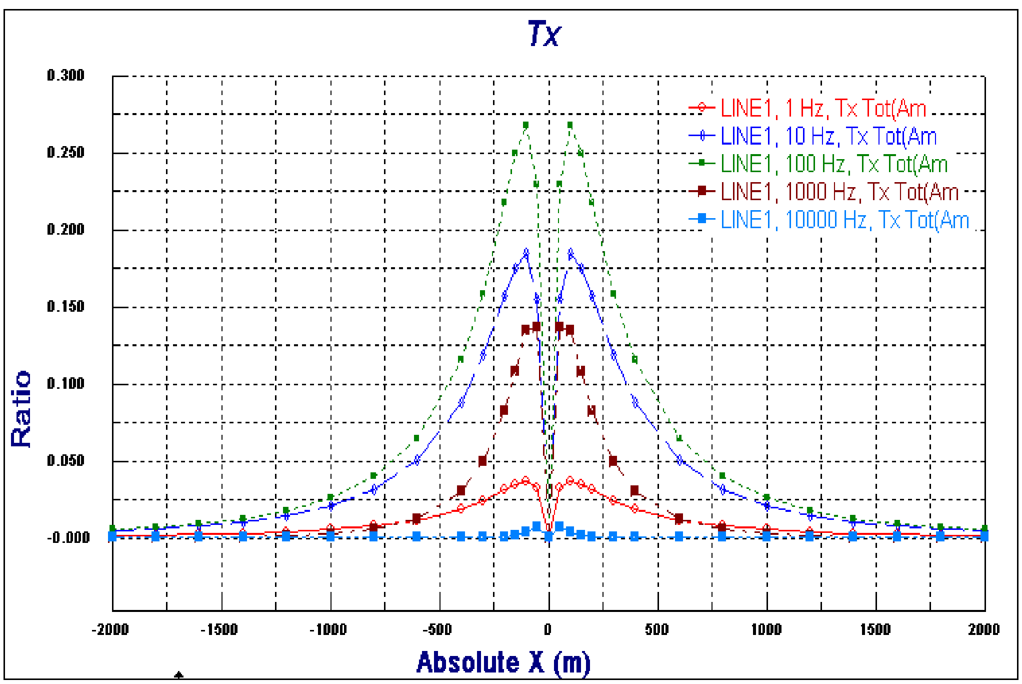


Figure D-2 – Calculated Tx component of the Tipper at various frequencies

The (Tx) response amplitude at 1,10,100,1000,10000 Hx. Peak amplitude at 100Hz

Inphase and Quadrature Response

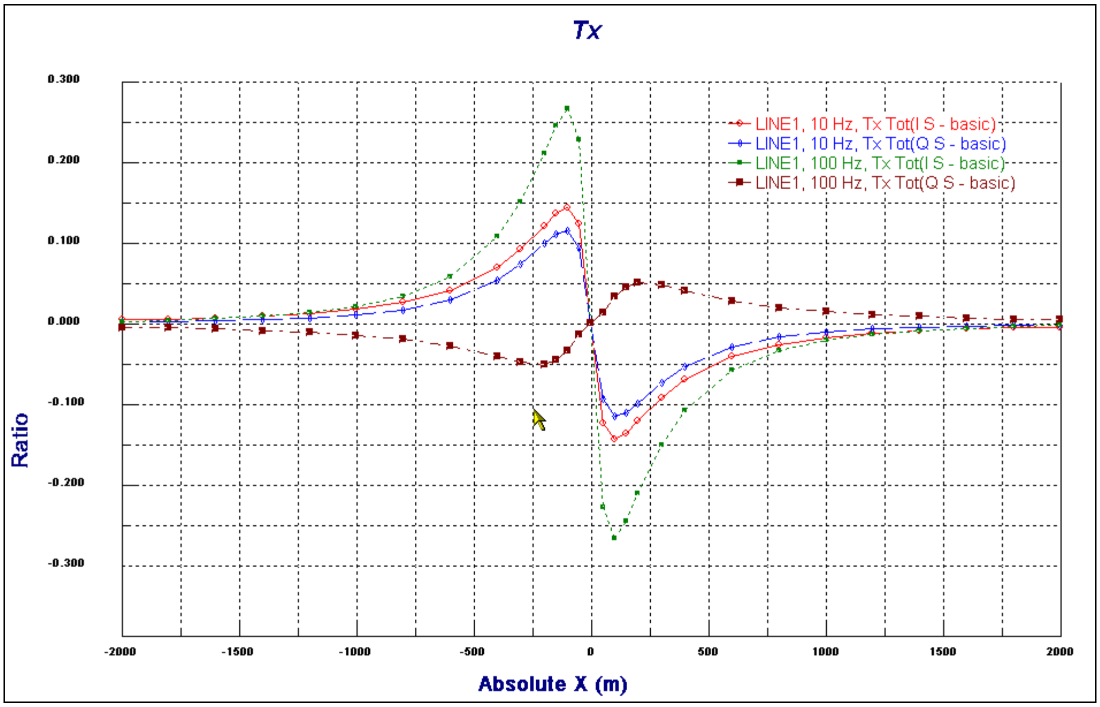


Figure D-3 – Calculated In-phase and Quadrature of the Tx component at various frequencies

Figure D-3 shows the In-phase and Quadrature response at 10 and 100Hz. Note the crossovers in the In-phase and Quadrature, and the phase reversal in the Quadrature responses from low to high frequencies.

Bo Lo, P.Eng, B.Sc. (Geophysics), Consultant
Geotech Ltd.
September, 2007

AFMAG Source Fields and ZTEM method[1]

AFMAG uses naturally occurring audio frequency magnetic fields as the source of the primary field signal, and therefore requires no transmitter (Ward, 1959). The primary fields resemble those from VLF except that they are lower frequency (tens & hundreds of Hz versus tens of kHz) and are usually not as strongly directionally polarized (Labson et al., 1985). These EM fields used in AFMAG are derived from world wide atmospheric thunderstorm activity, have the unique characteristic of being uniform, planar and horizontal, and also propagate vertically into the earth – to great depth, up to several km, as determined by the magnetotelluric (MT) skin depth (Vozoff, 1972), which is directly proportional to the ratio of the bedrock resistivity to the frequency (Figure D4).

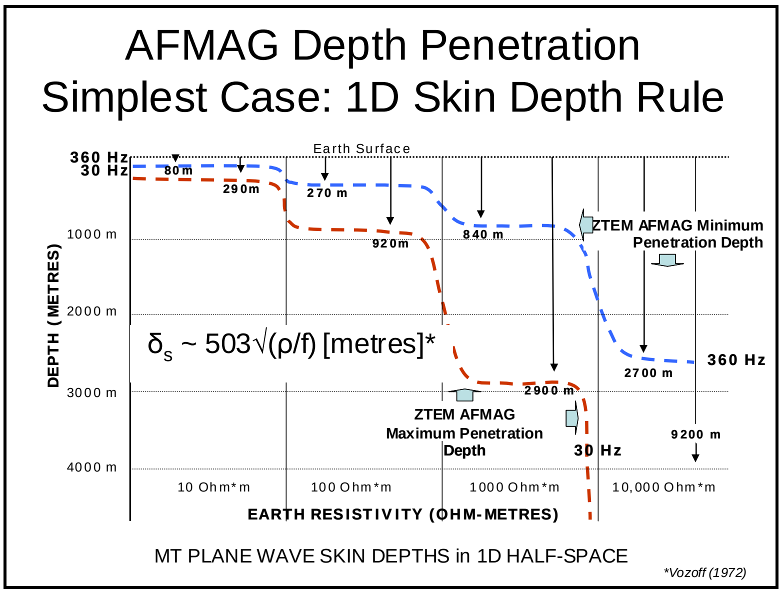


Figure D4: MT Skin Depth Penetrations for ZTEM in 30-360Hz and 10-1000 ohm resistivity

At the frequencies used for ZTEM, the penetration depths likely range between approx. 600m to 2km in this region (approx. 1k ohm-m avg. resistivity assumed), according to the following equation for the Bostick skin depth $\delta_B = 356 * \sqrt{(\rho / f)}$ metres (Bostick, 1977), which is considered appropriate as a rule of thumb equivalent depth estimate.

The other unique aspect of AFMAG fields is that they react to relative contrasts in the resistivity, and therefore do not depend on the absolute conductance, as measured using inductive EM systems, such as VTEM. Hence poorly, conductive targets, such as alteration zones and fault zones can be mapped, as well as higher conductance features, like graphitic units. Conversely, resistive targets can also be detected using AFMAG– provided they are of a sufficient size and contrast to produce a vertical field anomaly. Indeed resistors produce

[1] From: Legault, J.M., Kumar, H., and Milicevic, B. (2009): ZTEM tipper AFMAG and 2D inversion results over an unconformity uranium target in northern Saskatchewan, Expanded Abstract submitted to Society of Exploration Geophysics SEG conference, Houston, Tx, Nov-2009, 5 pp.

reversed anomalies relative to conductive features. Hence AFMAG can be effective as an all-round resistivity mapping tool, making it unique among airborne EM methods. A series of 2D synthetic models that illustrate these aspects have been created using the 2D forward MT modelling code of Wannamaker et al. (1987) and are presented in figures D5-D7.

The tipper from a single site contains information on the dimensionality of the subsurface (Pedersen, 1998), for example, in a horizontally stratified or 1D earth, $\boldsymbol{T}=0$ and as such H_Z is absent. For a 2D earth with the y-axis along strike, $T_Y=0$ and $H_Z = T_X * H_X$. In 3D earths, both T_X and T_Y will be non-zero. H_Z is therefore only present, as a secondary field, due to a lateral resistivity contrast, whereas the horizontal H_X and H_Y fields are a mixture of secondary and primary fields (Stodt et al., 1981). But, as an approximation, as in the telluric-magnetotelluric method (T-MT; Hermance and Thayer, 1975) used by distributed MT acquisition systems, the horizontal fields are assumed to be practically uniform, which is particularly useful for rapid reconnaissance mapping purposes. By measuring the vertical magnetic field H_X, using a mobile receiver and the orthogonal horizontal H_X and H_Y fields at a fixed base station reference site, ZTEM is a direct adaptation of this technique for airborne AFMAG surveying.

Jean M. Legault, M.Sc.A., P.Eng., P.Geo.
Geotech Ltd.

References

Bostickm, F.X., 1977, A simple almost exact method of MT analysis. Proceedings of the University of Utah Workshop on Electrical methods in Geothermal Exploration, 175-188.

Hermance, J.F., and Thayer, R.E., 1975, The telluric-magnetotelluric method, Geophysics, **37**, 349-364.

Labson, V. F., A. Becker, H. F. Morrison, and U. Conti, 1985, Geophysical exploration with audio-frequency natural magnetic fields: Geophysics, **50**, 656–664.

Murakami, Y., 1985, Short Note: Two representations of the magnetotelluric sounding survey, Geophysics, **50**, 161-164.

Pedersen, L.B., 1998, Tensor VLF measurements: Our first experiences, Exploration Geophysics, **29**, 52-57.

Stodt. J.A., Hohmann, G.W., and Ting, S.C., 1981, The telluric-magnetotelluric method in two- and three-dimensional environments, Geophysics, **46**, 1137-1147.

Vozoff, K., 1972, The magnetotelluric method in the exploration of sedimentary basins, Geophysics, **37**, 98–141.

Ward, S. H., 1959, AFMAG—Airborne and ground: Geophysics, **24**, 761–787.

Wannamaker, P.E., Stodt, J.A., and Rijo, L., 1987, A stable finite element solution for two-dimensional magnetotelluric modelling, Geophy. J. Roy. Astr. Soc., **88**, 227-296.

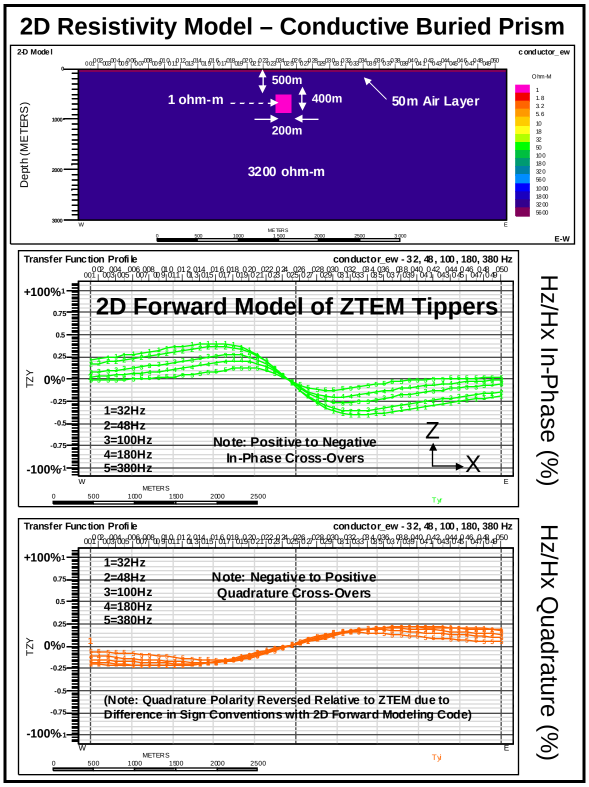


Figure D5: 2D synthetic forward model Tipper responses (Tzy) for conductive brick model.

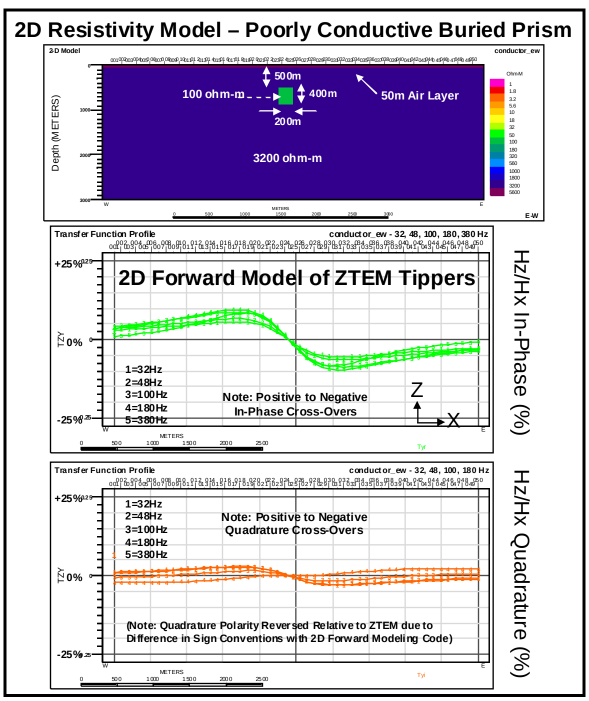


Figure D6: 2D synthetic forward model Tipper response (Tzx) for poorly conductive brick model.

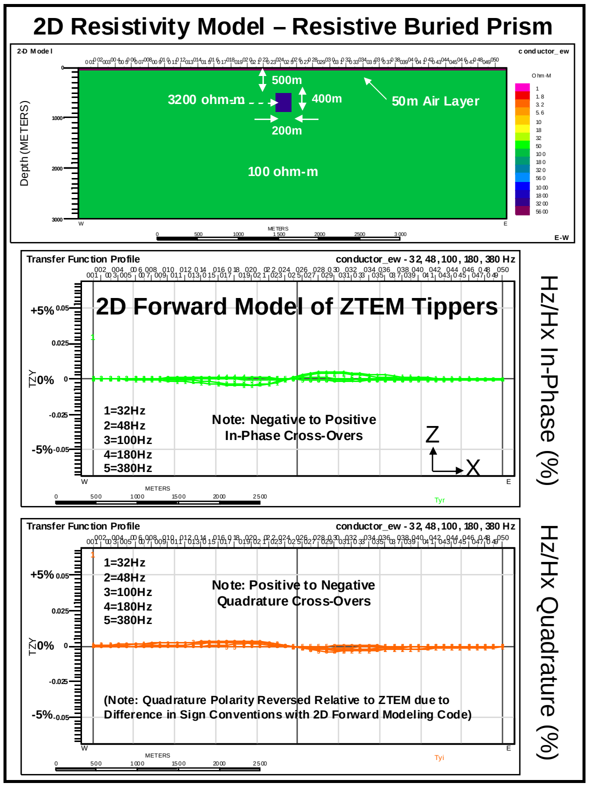


Figure D7: 2D synthetic forward model Tipper response (Tzx) for resistive brick model.

APPENDIX E

ZTEM (AIRBORNE AFMAG) TESTS OVER UNCONFORMITY URANIUM DEPOSITS[5]

Bob Lo[1], Jean Legault[2],Petr Kuzmin[3] [1]Formerly Geo Equipment Manufacturing Ltd., now Exploration Syndicate, Inc., bob.lo@expsyn.com,[2]Geotech Ltd., jean@geotech.ca, [3]Geo Equipment Manufacturing Ltd., petr@geotech.ca*

Key Words: ZTEM, AFMAG, electromagnetic, airborne, uranium, Athabasca.

INTRODUCTION

A series of demonstration tests were conducted using the ZTEM, airborne AFMAG system over deep targets in the Athabasca Basin of Saskatchewan, Canada. These tests were conducted in mid-2008 and were flown to test ZTEM's ability to detect large conductive targets at depth; deeper than conventional airborne EM methods. Data are presented over areas where the conductors are located 450-600 metres beneath the surface. As well, a case of ZTEM following the plunge of a conductor to over 800 metres depth is shown.

BACKGROUND

The ZTEM system is the latest implementation of an airborne AFMAG system first commercialized in late 2006. ZTEM uses a large, 8 metre diameter airborne air core coil, slung from a helicopter, to measure the vertical component of the AFMAG signal. Two 4 metre square coils are deployed on the ground to measure the horizontal field. The ZTEM system has flown successful demonstration surveys over porphyry copper deposits in the southwest USA (Zang et al., 2008).

ZTEM was tested in the Athabasca Basin in Canada in May of 2008 to determine its depth of investigation and to determine its suitability for mapping deep conductors in the crystalline basement. Over 30% of the world's U3O8 is mined in the Athabasca Basin from unconformity uranium deposits. Unconformity uranium deposits of the Athabasca Basin are often associated with conductors located in the crystalline basement. The search for economic uranium deposits is moving to areas of the basin which are deeper and beyond the detection limits of modern airborne instrumentation. This creates the requirement for a system which can detect conductivity past the detection limits of modern traditional EM systems. This was the motivation behind the field trials of the ZTEM system in the Athabasca Basin. Several areas where known deep conductors (450-600m+) were located were flown. Also, a test survey block in the northern part of the basin was able to trace a deep and plunging conductor to depths that no other airborne EM system has been able to achieve.

ATHABASCA BASIN GEOLOGY

The high-grade uranium deposits within the Athabasca Basin are associated with the unconformity between the essentially flat-lying Proterozoic Athabasca Group sandstones and the underlying Archean-Paleoproterozoic metamorphic and igneous basement rocks. The deposits occupy a range of positions from wholly basement-hosted to wholly sediment-hosted, at structurally favourable sites in the interface between the deeply weathered basement and overlying sediments of the Athabasca Basin (Ruzicka, 1997). The locations of These deposits are lithologically and structurally controlled by the sub-Athabasca unconformity and basement faults and fracture zones, which are localized in graphitic pelitic gneisses that may flank structurally competent Archean granitoid domes (Quirt, 1989).

In general, most of the known important deposits tend to occur within a few tens to a few hundred metres of the unconformity and within 500 m of the current ground surface. This may be more of a limitation of exploration techniques. There is no reason to believe that the distribution of the deposits is dependent on the modern day depth of burial.
Empirically, the geophysical exploration for unconformity type uranium targets have been to search for large basement

[5] Extended abstract submitted to 20[TH] ASEG International Geophysical Conference & Exhibition, Adelaide, AU, 22-26 Feb, 2009.

structures which post date the sandstone deposition of the basement (Matthews et. al, 1997). All the deposits located so far are associated with fault structures associated with a graphitic conductive basement. An alteration zone of clay silicification and enrichment around the deposits probably leads to magnetite destruction causing the magnetic low observed around the deposits. The clay alteration should give rise to a resistivity low signature about the deposits. The low conductivity of the clay alteration makes it a difficult target for airborne EM if it is buried at significant depth.

ZTEM INSTRUMENTATION AND PRESENTATION

ZTEM is an airborne AFMAG system introduced by Geotech Ltd. of Canada in early 2007 (Lo et al., 2008). In a ZTEM survey, a single vertical dipole air-core coil is flown over the survey area in a grid pattern similar to other airborne electromagnetic surveys. Two orthogonal, air-core, horizontal axis coils placed close to the survey site measures the horizontal EM fields for reference. A GPS array on the airborne coil monitors its attitude for post-flight corrections.

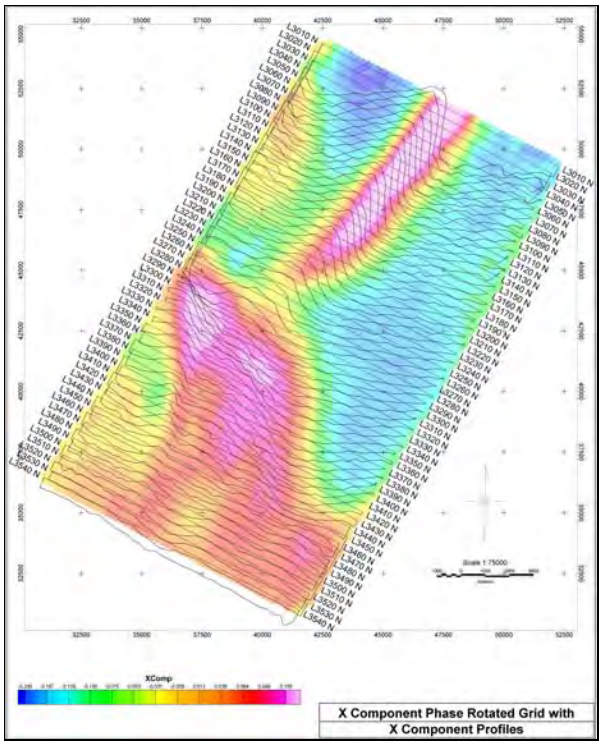


Figure 1 – Stacked profiles of the x-component Tipper over the gridded values of the phase rotated x-component data. Note that the cross-overs in the profiles are now peaks on the image.

As the source field is assumed to be far away, the excitation of the ground is more or less uniform. For large structures, the signal fall-off will be much slower than from a dipole source, such as those energized by traditional airborne systems. With the ZTEM system being less susceptible to terrain clearance, the planned ground clearance height is higher and the terrain drape is looser as compared to standard helicopter EM surveys.

The two Tippers obtained from the relationship between the vertical airborne coil and the two ground coils have a cross-over over a steeply dipping, plate-like body. The cross-overs can be made into local maxima via a 90 degree phase rotation which allows for easier interpretation of the gridded values. Figure 1 is an example of this transformation.

To present the data of both Tippers as one image, we calculate a parameter termed the DT which is the horizontal divergence of the two Tippers, much in the same manner as the "peaker" parameter in VLF (Pedersen, 1998). The DT is typically plotted with an inverted colour bar as it is negative over a steeply dipping thin body.

ZTEM RESULTS – NORTHERN ATHABASCA BASIN

Figure 2 shows gridded values from a number of ZTEM lines over an area where the sedimentary cover is approximately 450-600 metres thick. A number of traditional EM systems have also been flown over this block. While they were able to detect conductors, the resolution of the conductive features is not nearly as detailed as the information provided by ZTEM.

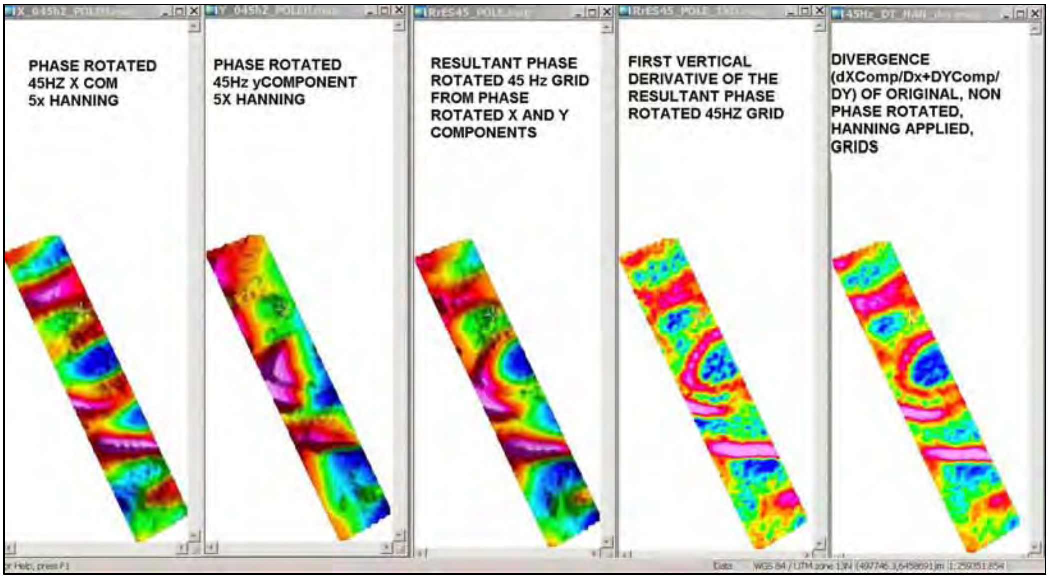


Figure 2 – ZTEM results over an area of 450-600 metre thick sedimentary cover.

Figure 3, from another area, shows the data from one of the larger blocks that was flown. It is a 3D composite image of the DT at various frequencies plotted at the equivalent skin depth assuming a 1,000 ohm-m average resistivity.

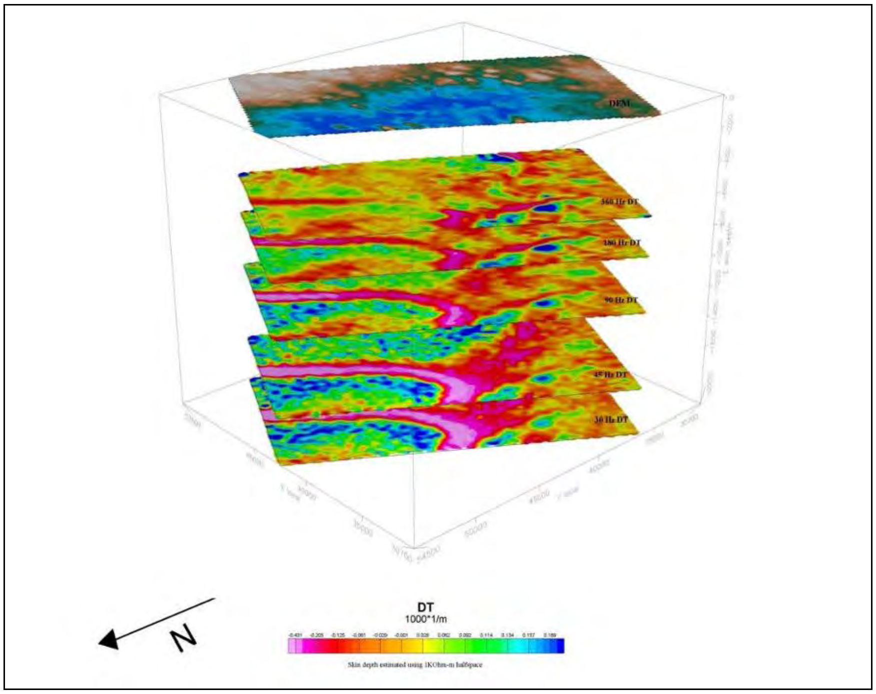


Figure 3 - Perspective view of DT's of different frequencies plotted at the skin depth (using a 1,000 ohm-m Earth.

The data in Figure 3 come from a survey over the north rim of the Athabasca Basin. The sandstone cover is about 500mon the left hand side of the image, and progressively getting deeper to the right. It is about 700m in the middle part of the image and over 800 metres thick on the right middle portion where exploration drilling is concentrated. Starting in the middle left and trending to the right of the image, there is a known graphitic shear.

In the uppermost (600m) "depth slice", Figure 3 shows a linear conductive feature that progressively weakens as one moves to the right until it is no longer seen. This is interpreted to be due to the graphitic shear conductor plunging deeper past the depth of investigation of the 360 Hz data. The lower frequencies penetrate more into the sedimentary cover that is deeper towards the right. DT's of decreasing frequency show the linear conductive feature extending more and more to the right. The feature also strengthens/sharpens into a synformal shape with lower frequencies. This fits with what the known geology of a plunging conductor at depth is doing.

At the nose of the fold, in the right third of the images, we also see another, broader anomalous zone that trends towards the back of the image. At this location, two radioactive springs are situated. These spring waters which are anomalously high in uranium and radon may reflect the upward migration of deep waters along faults, suggesting structural targets in areas where basinal waters may have tapped a radioactive source. This broad DT trend might be the plunge of the fold axis that is aligned away from the front of the image. An anomaly along this trend, at the highest frequency, that steadily grows with each decreasing frequency can be seen. This might represent an alteration zone in the sandstone that is detected at the shallowest depth. By about the 90Hz DT depth slice or so, we are possibly in the deeper basement and into a basement graphitic unit.

CONCLUSIONS

A number of successful ZTEM tests were conducted over the Athabasca Basin. The tests demonstrated that ZTEM can easily detect conductivity to 800 metres beneath relatively resistive sedimentary cover. Assuming a 1,000 ohm-metre resistivity, the skin depth of the 30 Hz data is approximately 2,000 metres. The 30 Hz data presented have good signal to noise ratios indicating a deep depth of exploration. The observation that ZTEM may be detecting the clay alteration above the crystalline basement is a significant advantage for exploration of unconformity uranium deposits.

More demonstration surveys are planned in the Athabasca Basin later this year. And more target types for testing are also planned.

ACKNOWLEDGEMENTS

The authors thank Geotech Ltd. for allowing them to publish this work and for providing the support required to write this abstract and to present this paper.

REFERENCES

Labson, V. F., Becker A., Morrison, H. F., and Conti, U., 1985, Geophysical exploration with audiofrequency natural magnetic fields, Geophysics, Vol. 50, p. 656-664.

Lo, B., Zang, M., Kuzmin, P., 2008, Geotech's Z-TEM (Airborne AFMAG) Instrumentation, a paper presented at KEGS PDAC 2008 Symposium, Toronto.

Matthews, R., Koch, R. and Leppin, M., 1997, Advances in Integrated Exploration for Unconformity Uranium Deposits in Western Canada; in Proceeding of Exploration 97, edited by Arnis Gubins, Prospectors and Developers Association of Canada, Toronto.

McMullan, S.R., Matthews, R.B, and Robertshaw, P., 1990, Exploration geophysics for Athabasca Uranium Deposits, in: Proceedings of Exploration 87, Ontario Geological Survey.

Pedersen, L.B, Qian, W., Dynesius, L., Zhang, P., 1994, An airborne tensor VLF system. From concept to realization, Geophysical Prospecting, Vol. 42.

Ruzicka, V.R., 1997, Metallogenic features of the uranium-polymetallic mineralization of the Athabasca Basin, Alberta, and a comparison with other parts of the basin; in R.W. Macqueen, ed., Geological Survey of Canada, Bulletin 500, 31-79.

Wheatley, K., Murphy, J., Leppin, M., and Climie, J.A., 1996, Advances in the Genetic Model and Exploration Techniques for Unconformity-type Uranium Deposits in the Athabasca Basin; in Ashton, K.E., Harper, C.T., eds., MinExpo '96 Symposium – Advances in Saskatchewan Geology and Mineral Exploration: Saskatchewan Geological Society, Special Publication No 14, p. 126-136.

Quirt, D., 1989, Host rock alteration at Eagle Point South: Sask. Research Council, Publication no. R-855-1-E- 89, 95p.

Ward, S. H., 1959, AFMAG - Airborne and Ground: Geophysics, Vol. 24, p. 761-787.

Zang, M., Lo, B., 2008, The Application of Airborne Natural Field Electromagnetics (ZTEM): Some Examples from the Southwestern United States, a paper presented at the 2008 PDAC, Toronto

APPENDIX F

2D ZTEM Inversion Results

for

Sanatana Resources Inc.
Watershed Project
Gogama, Ontario

Project: 11118

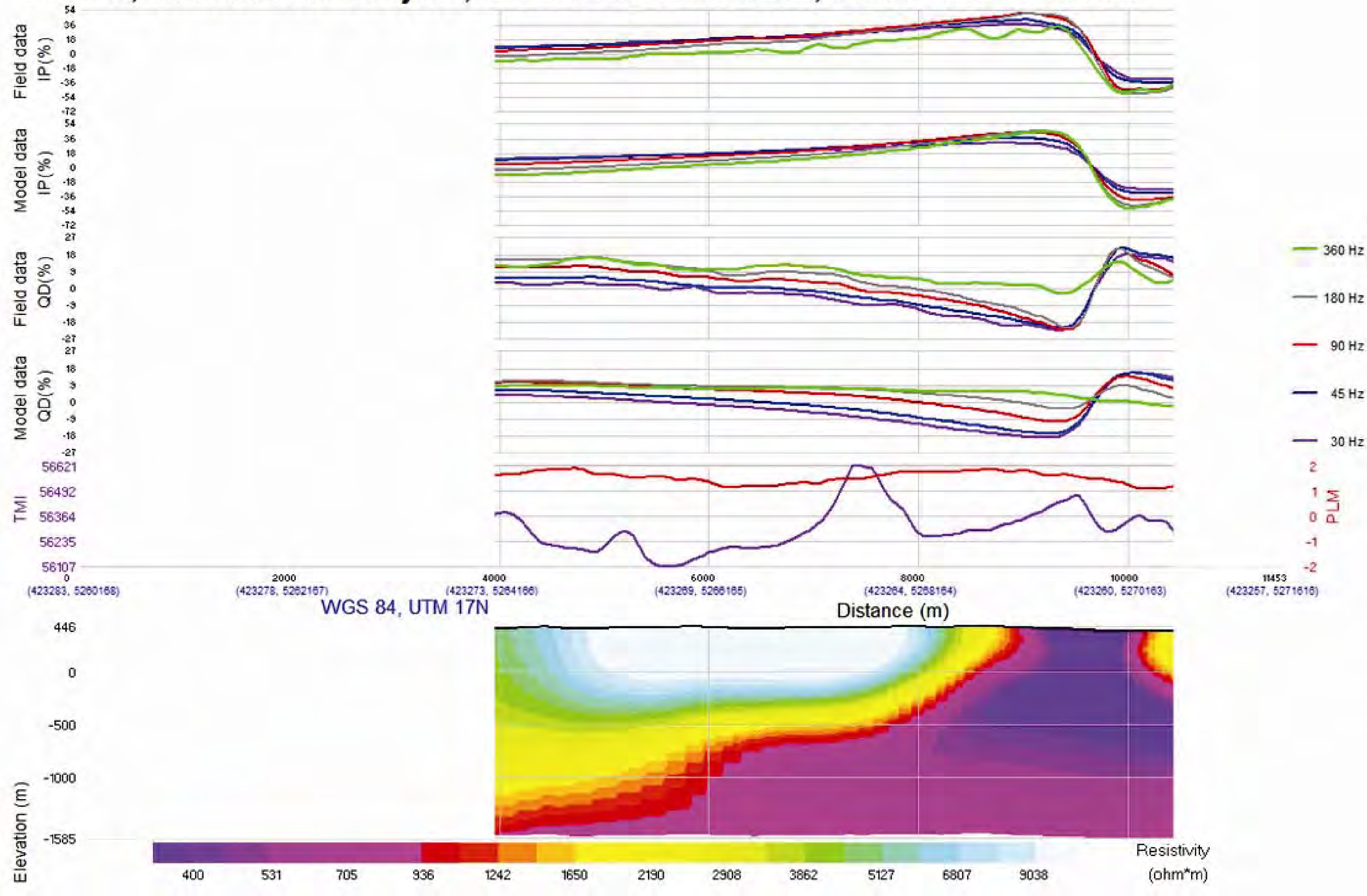
By:
Geotech Ltd.

245 Industrial Parkway North
Aurora, Ont., CANADA, L4G 4C4
Tel: 1.905.841.5004
Fax: 1.905.841.0611
www.geotech.ca
Email: info@geotech.ca
June, 2011

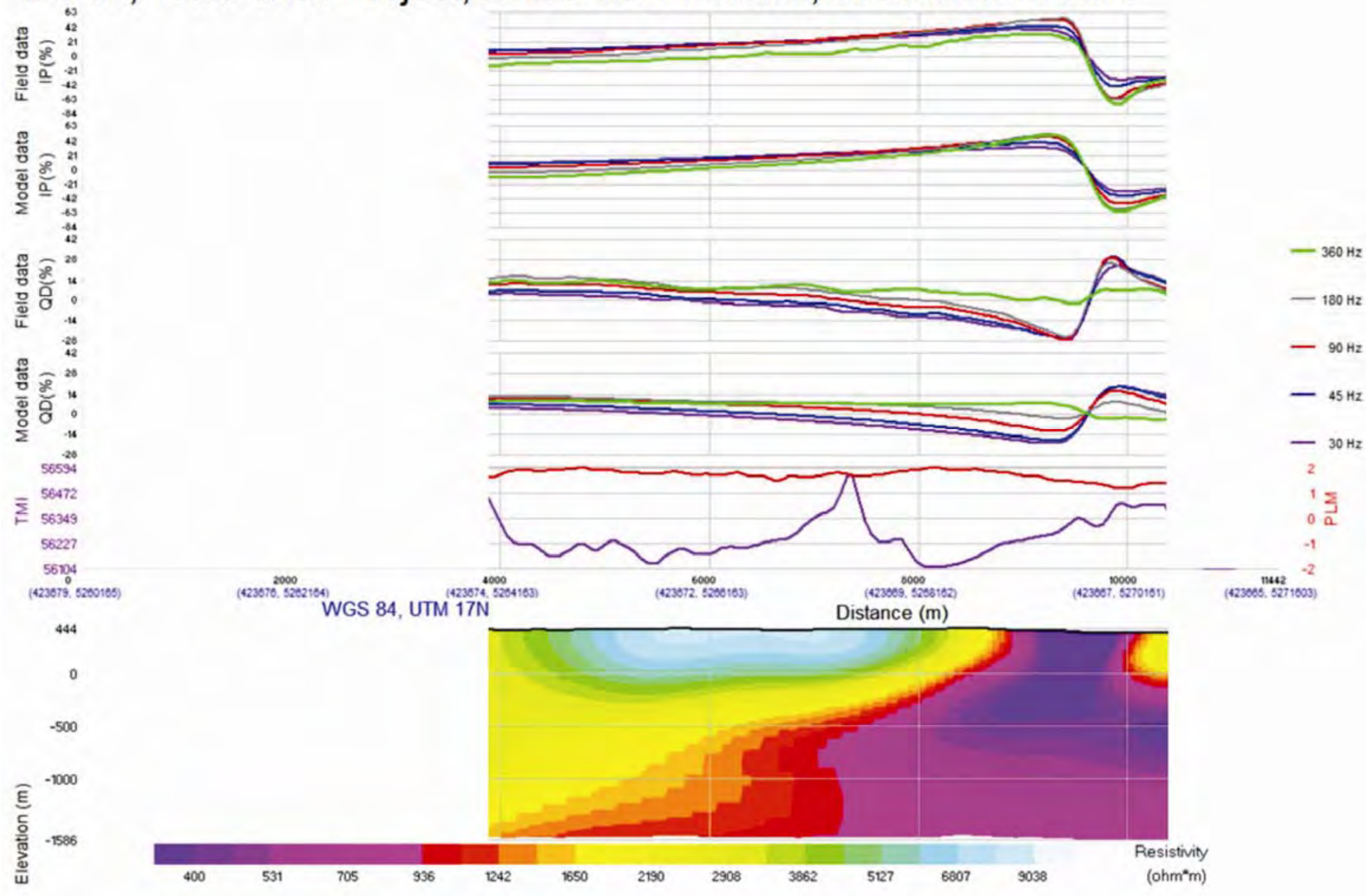
Summary

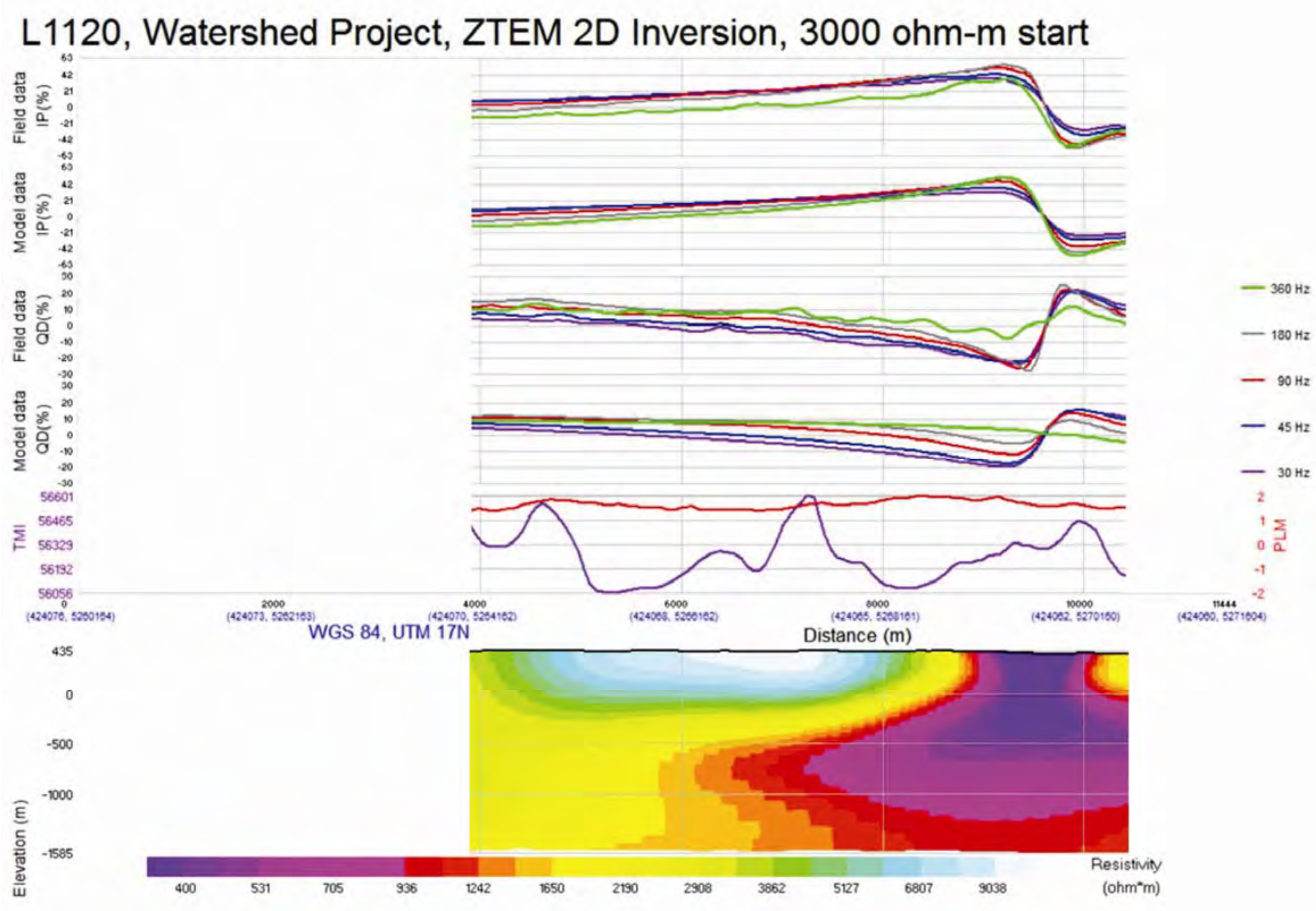
- Geotech AV2DTOPO program was used to perform the inversion of ZTEM data (Tzx in-line) with topography effects and bird altitude considered.
- Total 42 lines of data were inverted.
- 3000 ohm-m start models and various number of frequency data were used in the inversion depending on the noise level.
- Due to high power lines noise level, some lines were not inverted or were partially cut off.
- Slide 3 shows the inverted line locations over IP 90Hz DT image and TMI image.
- Slides 4 and 45 show the inversion results, the inversion parameters, and the location over IP 90Hz DT image for each line.

L1080, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start

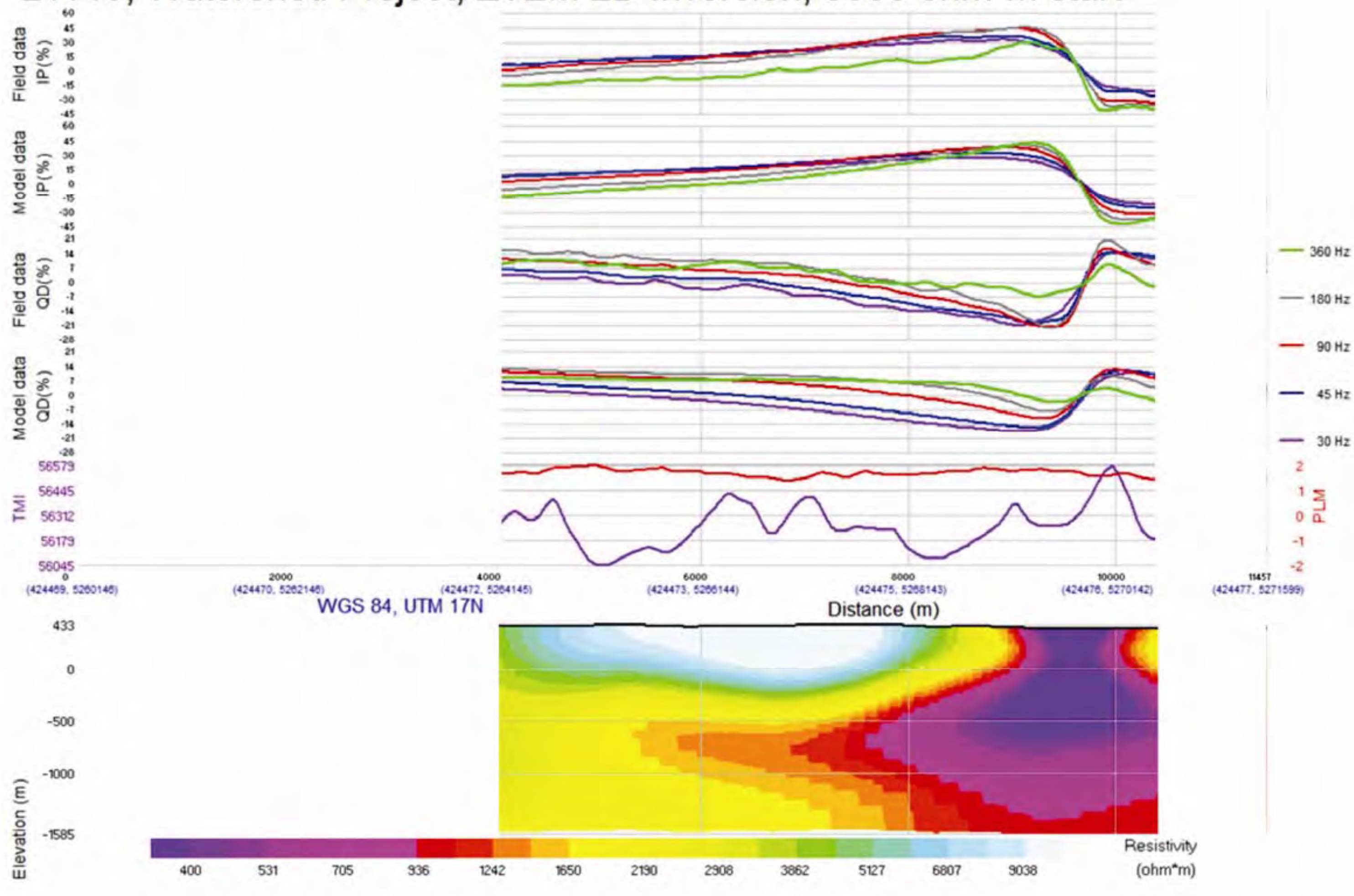


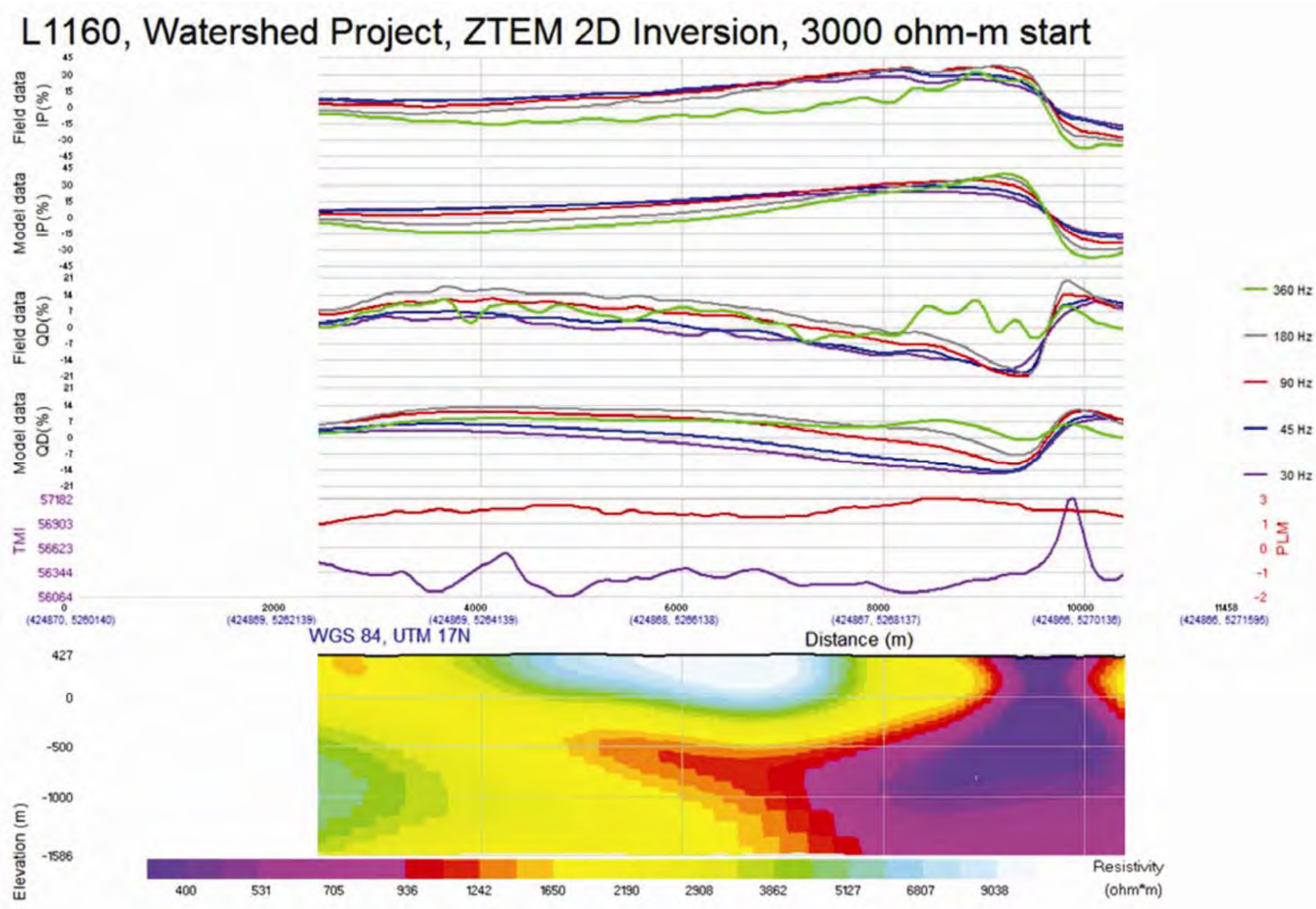
L1100, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start

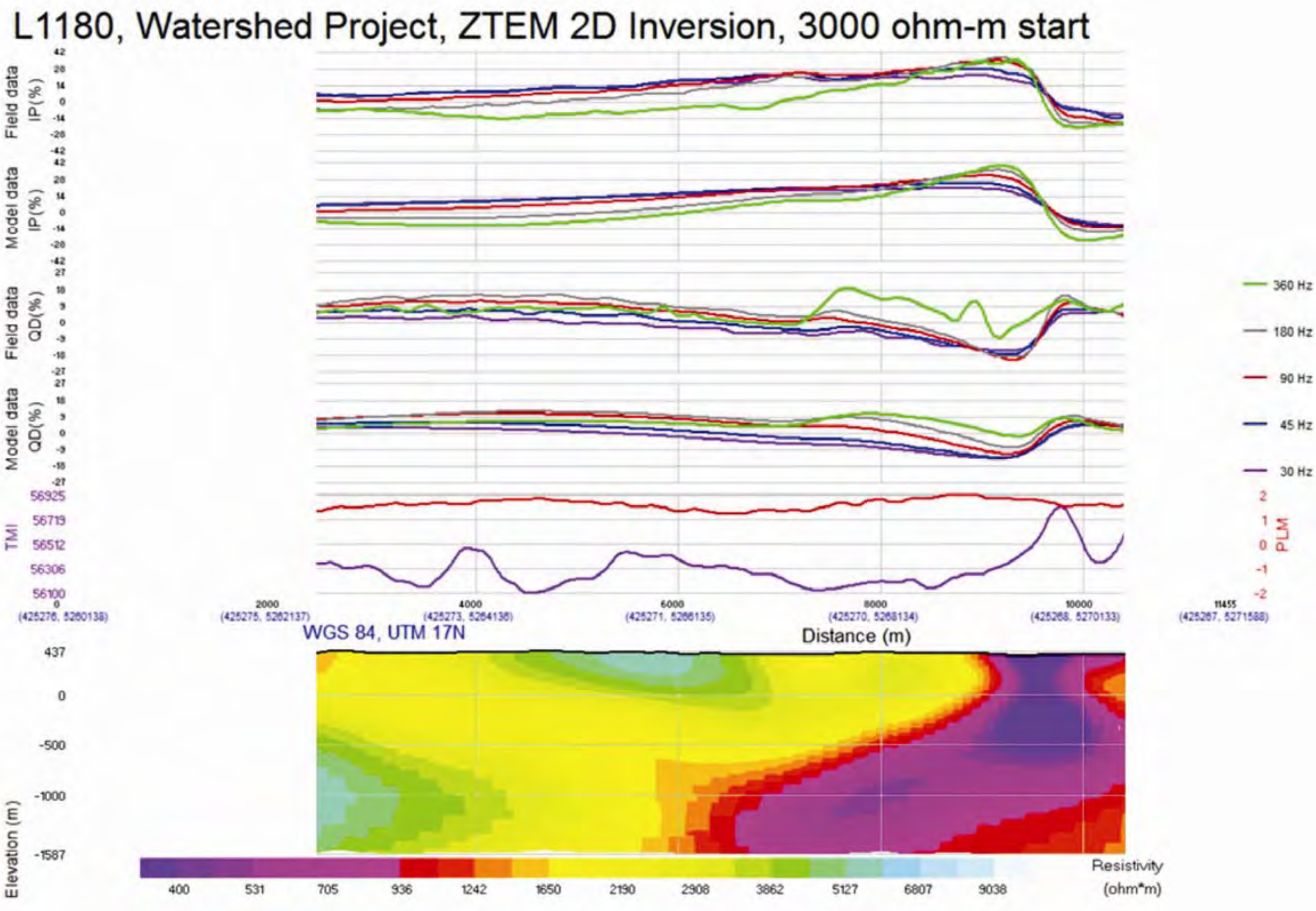



L1120, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

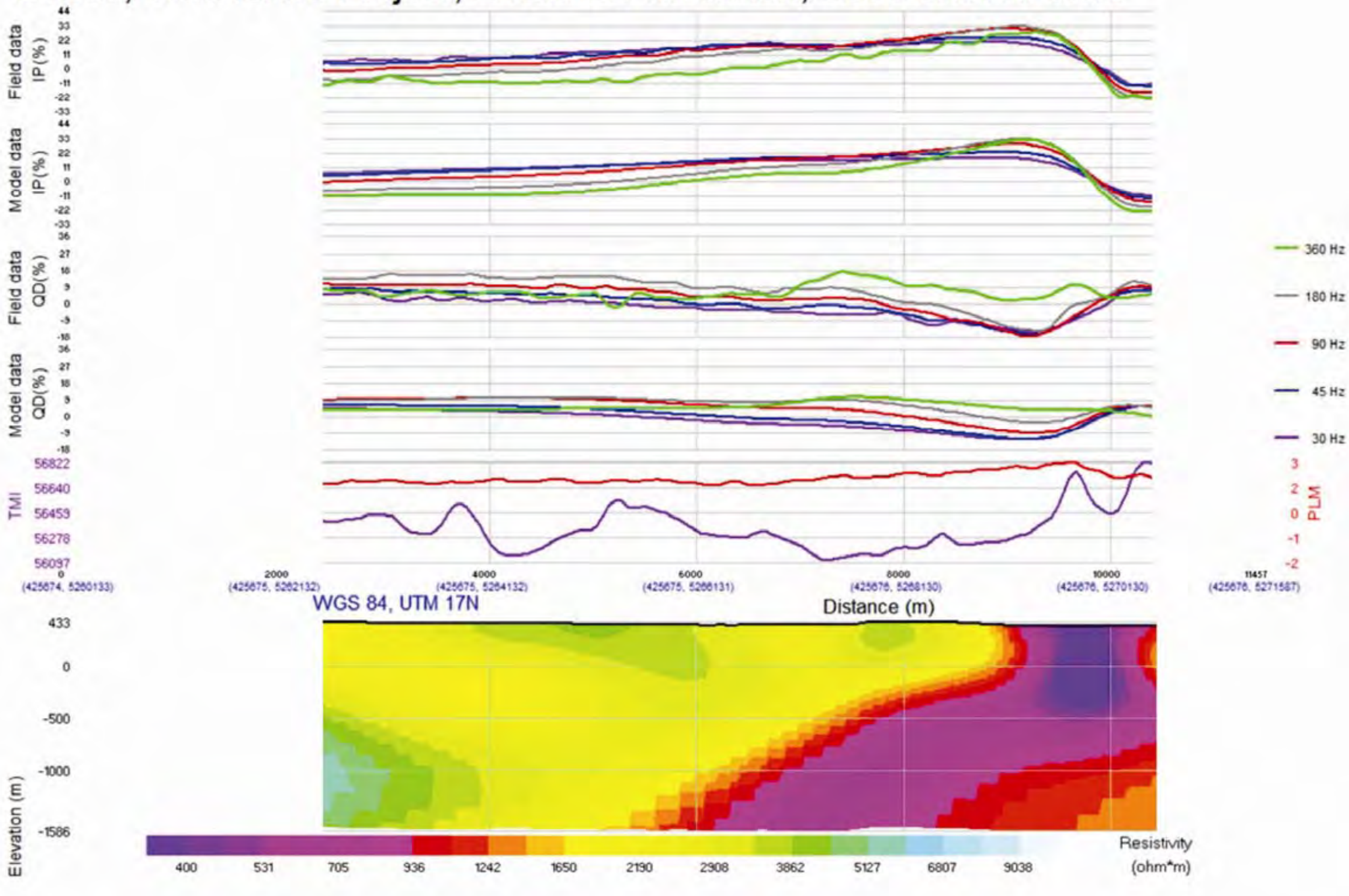
L1140, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start



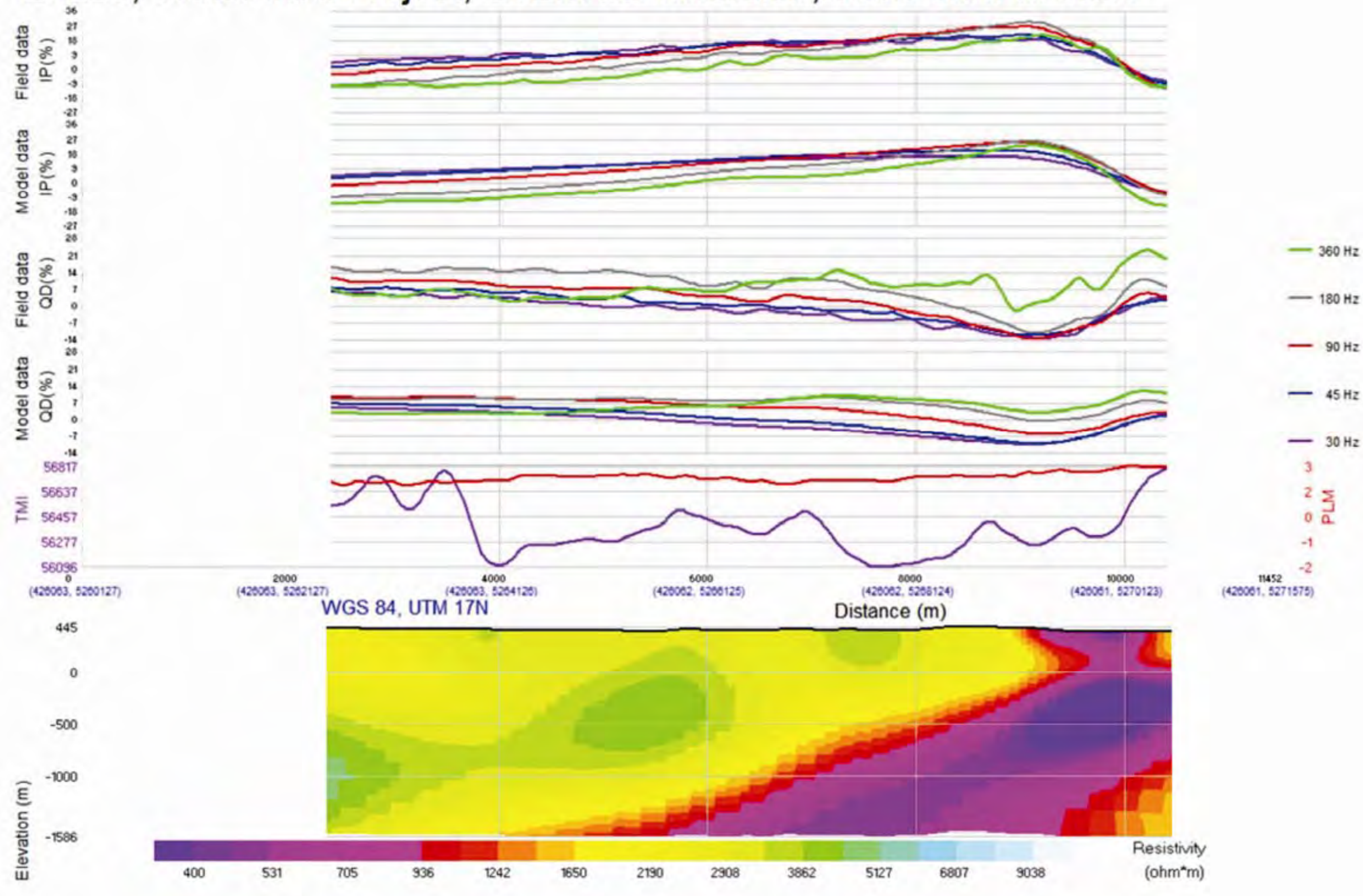

L1160, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
PLM
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)

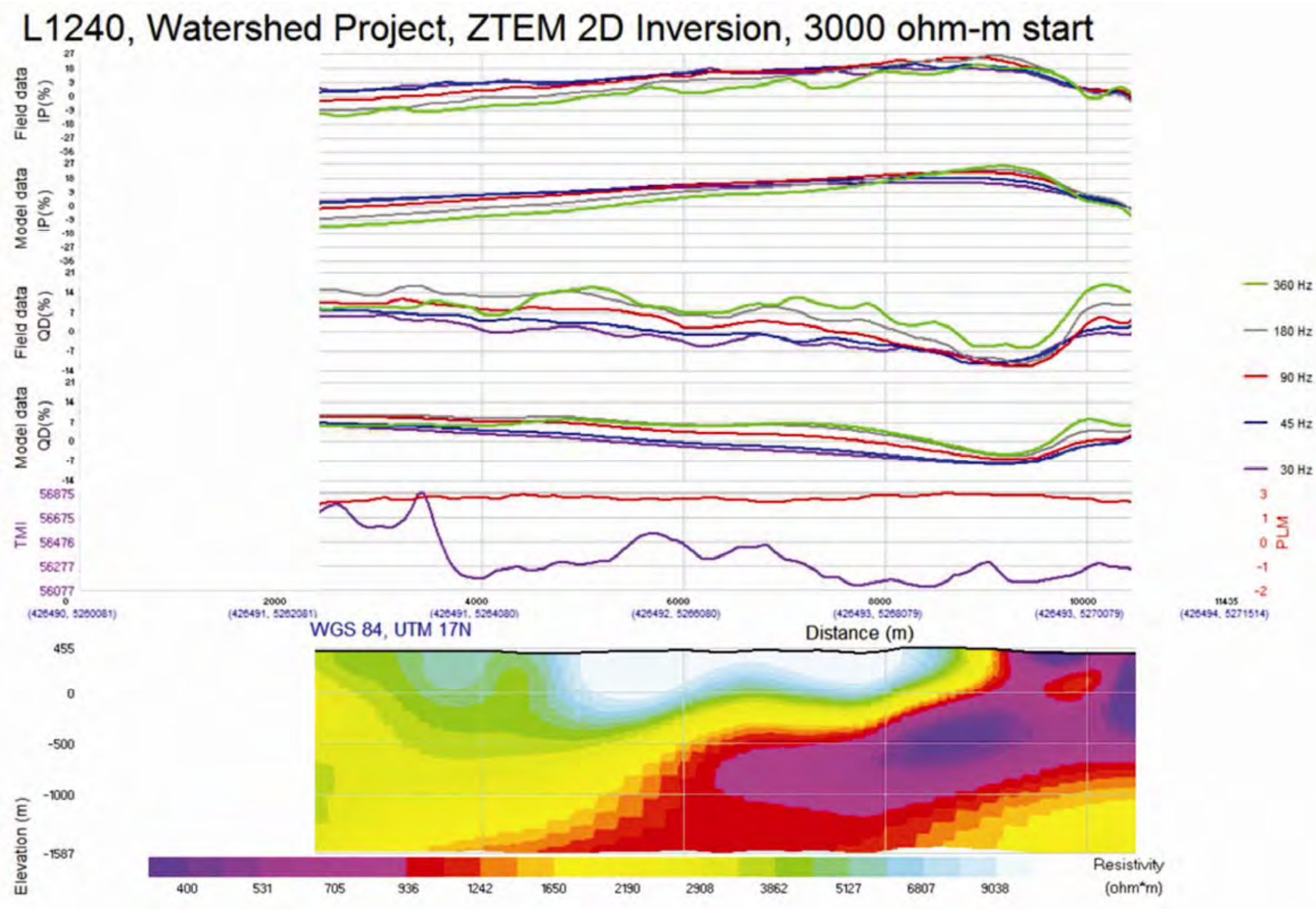

L1180, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

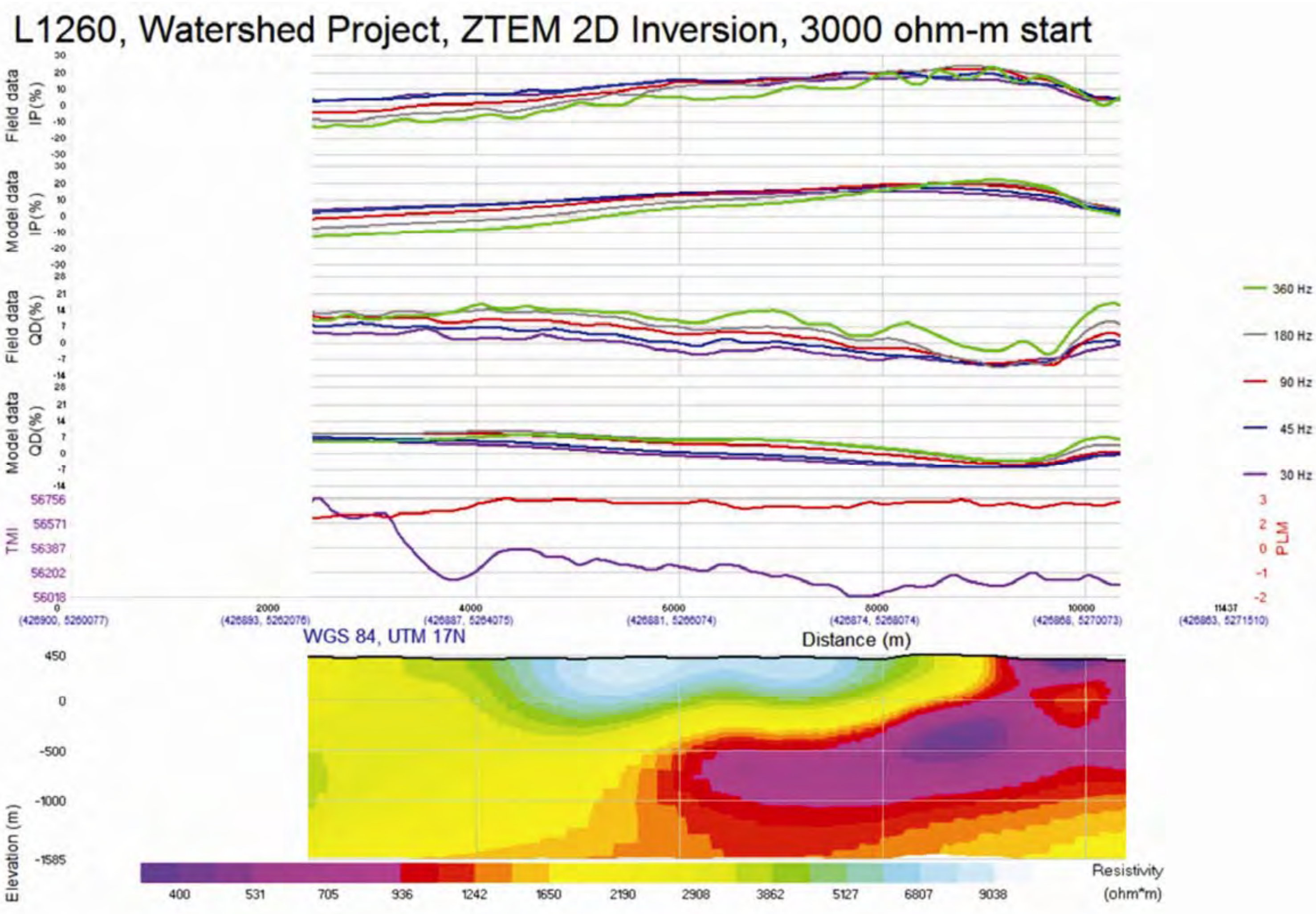
L1200, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start



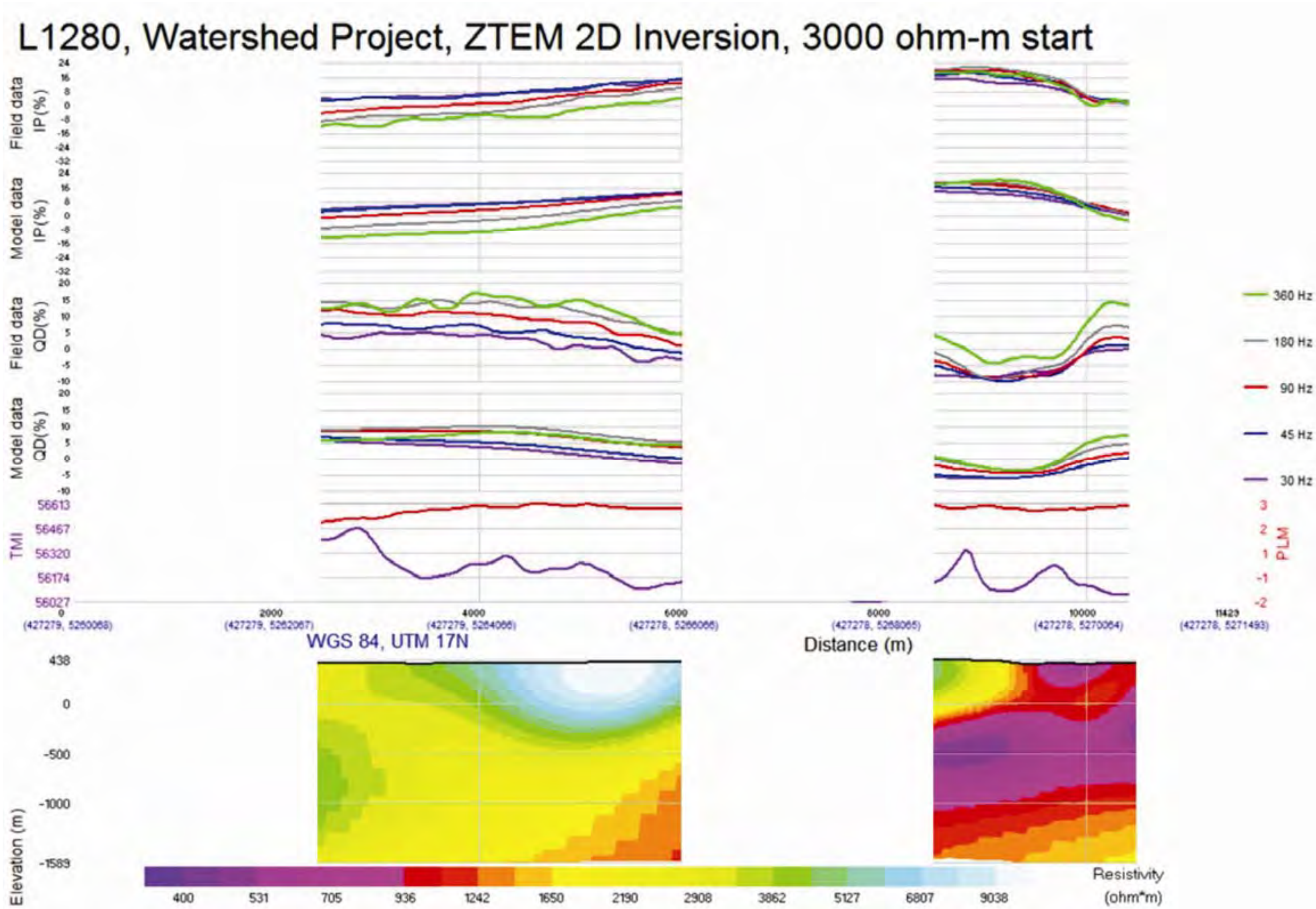
L1220, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start



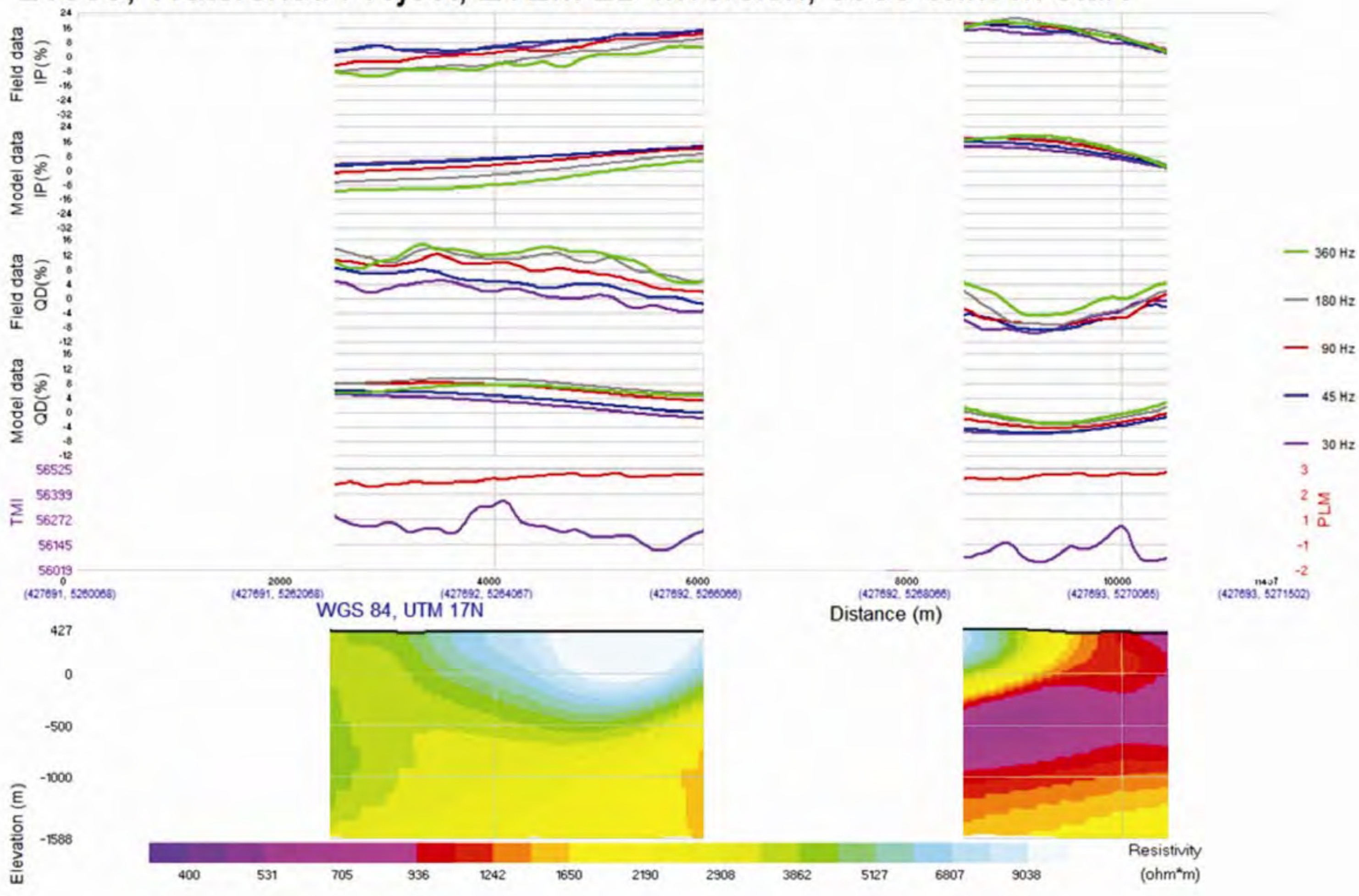

L1240, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)

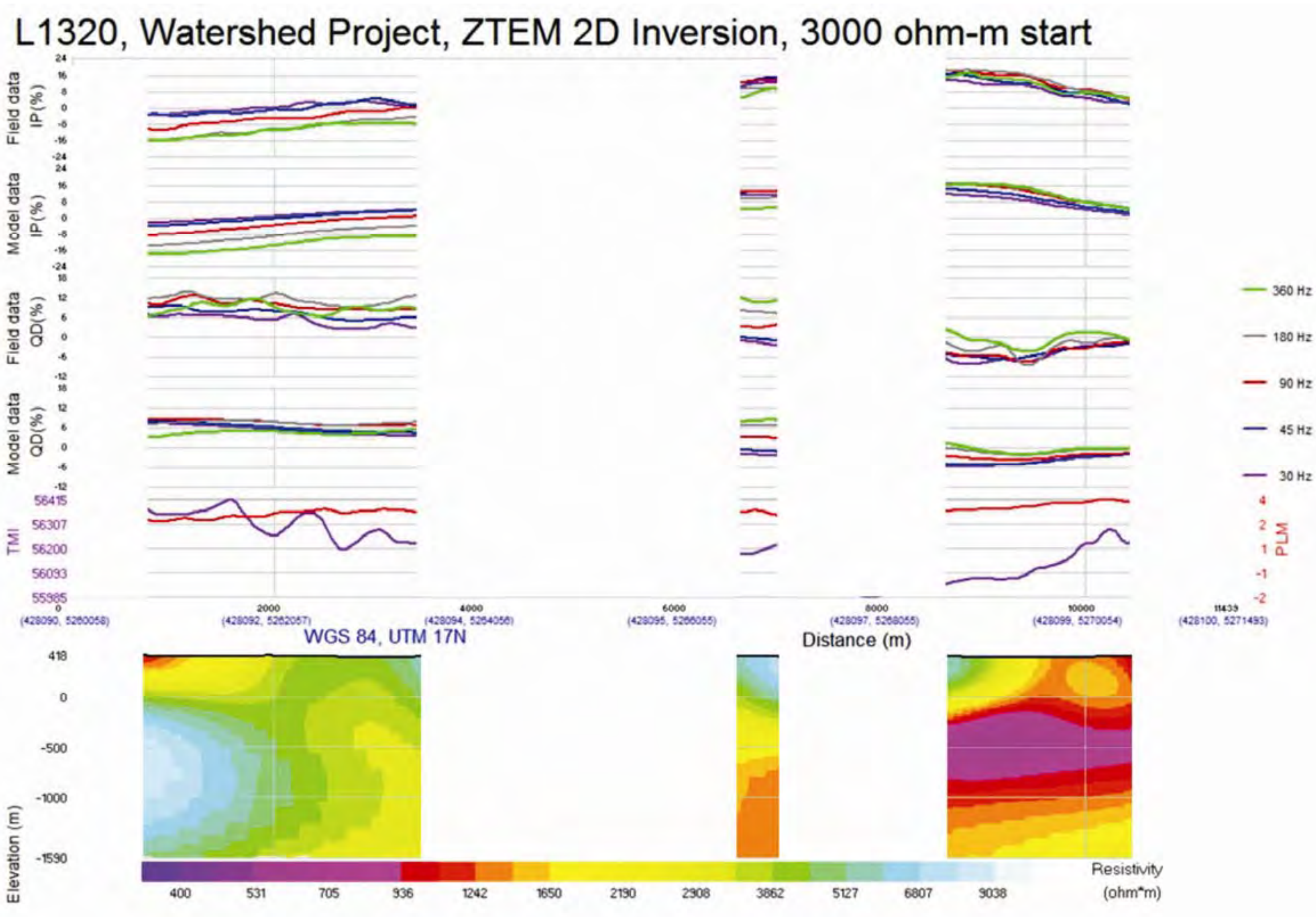


L1260, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)

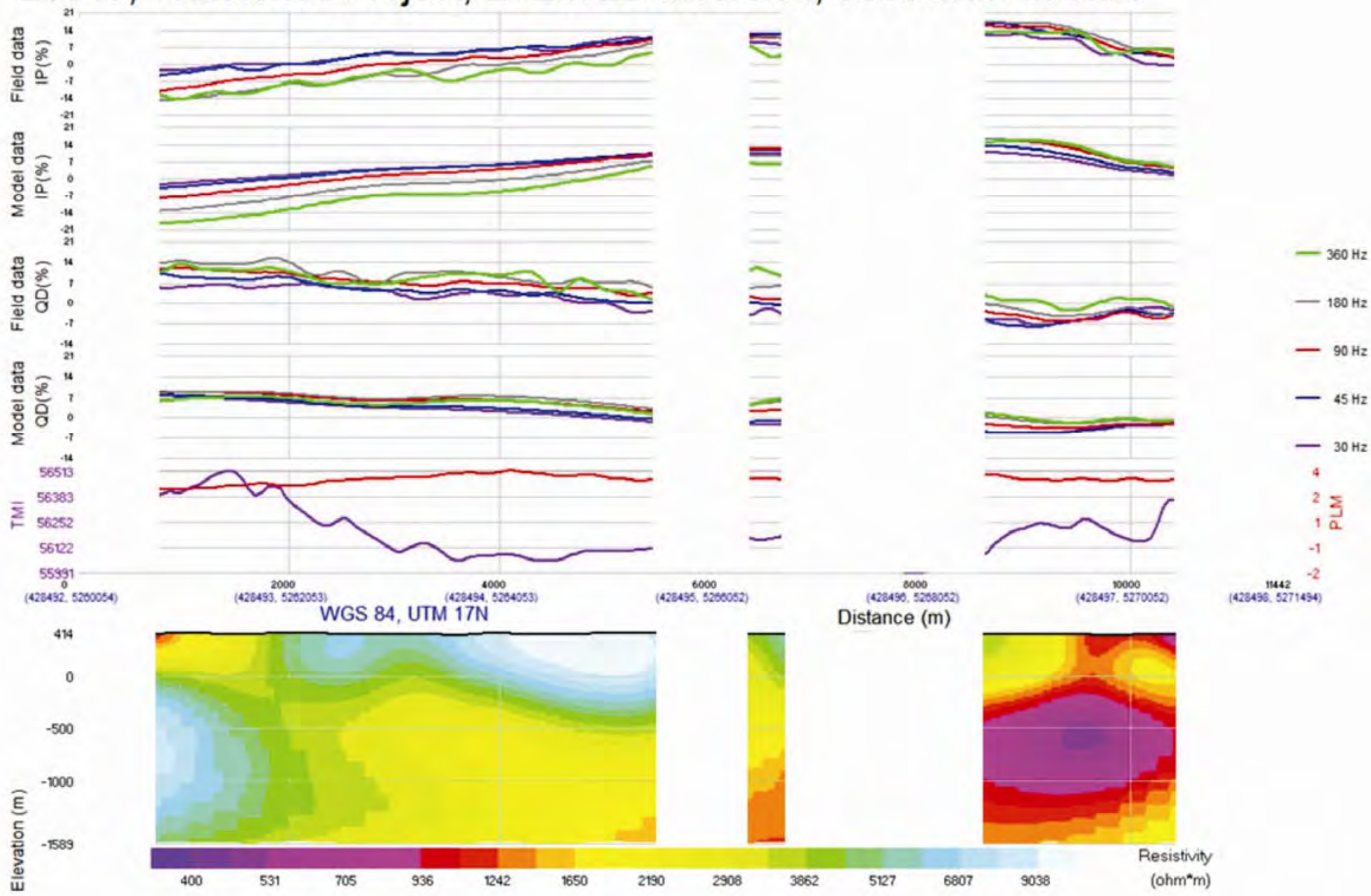

L1280, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

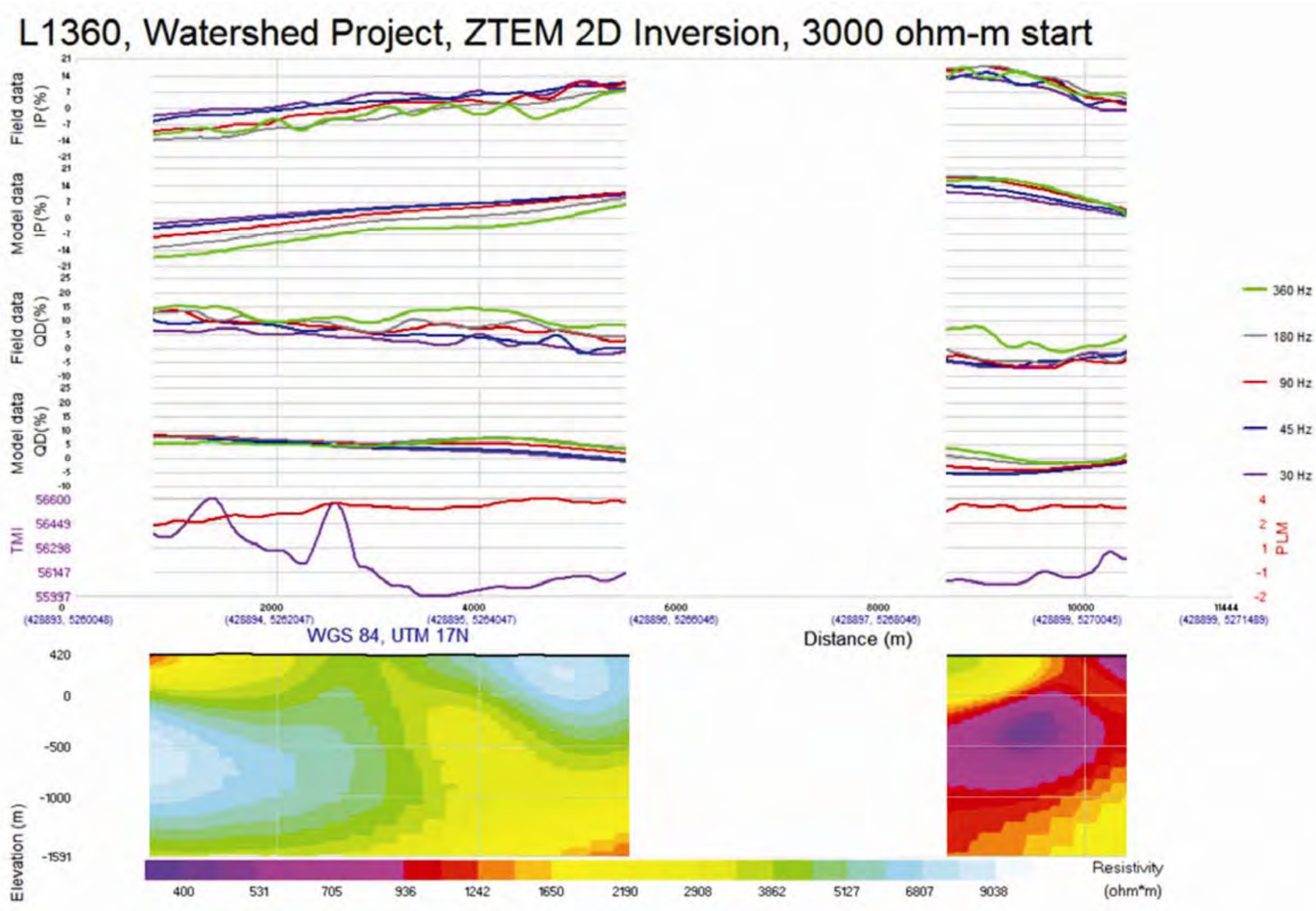
L1300, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start




L1320, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

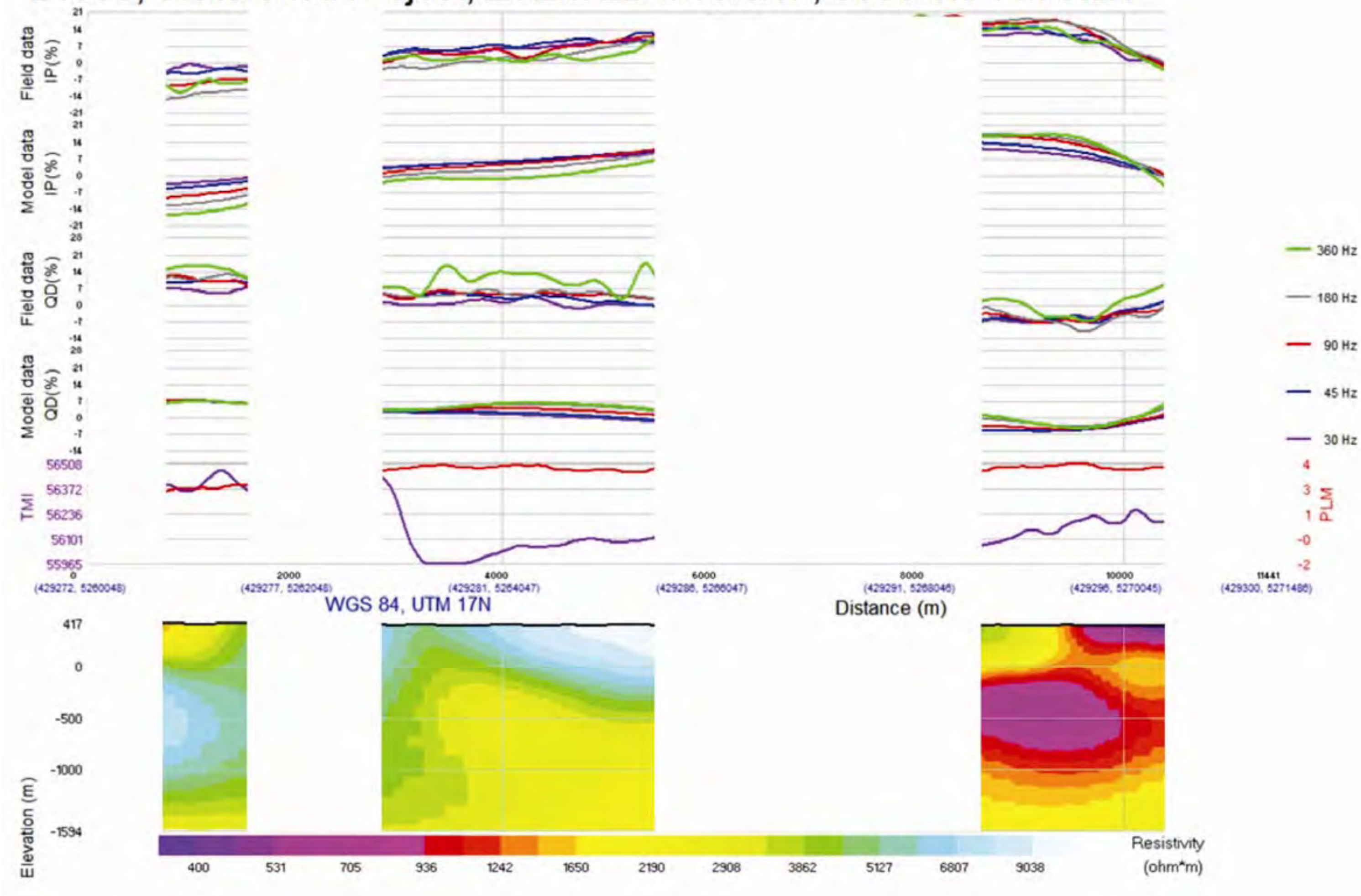
L1340, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start

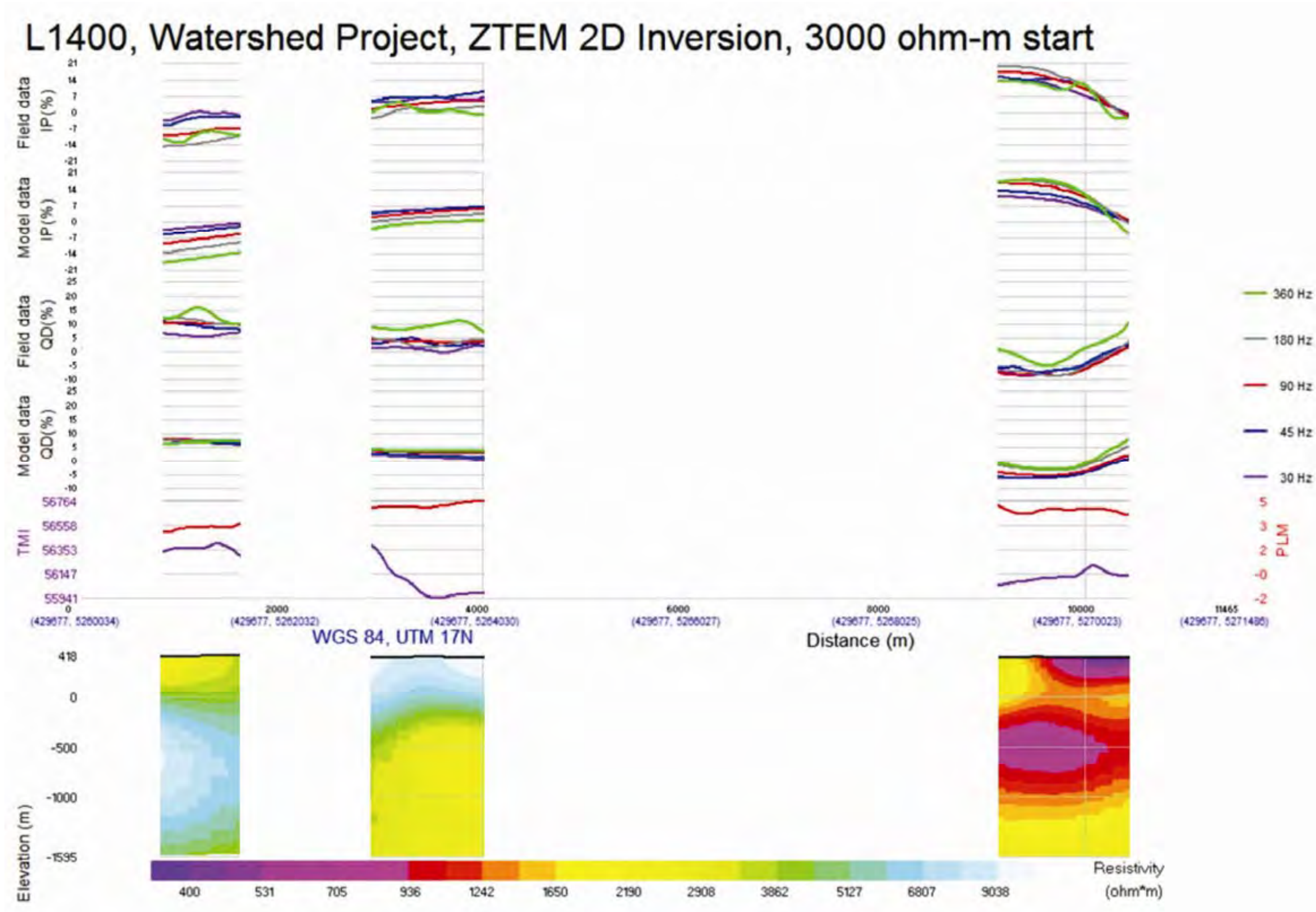


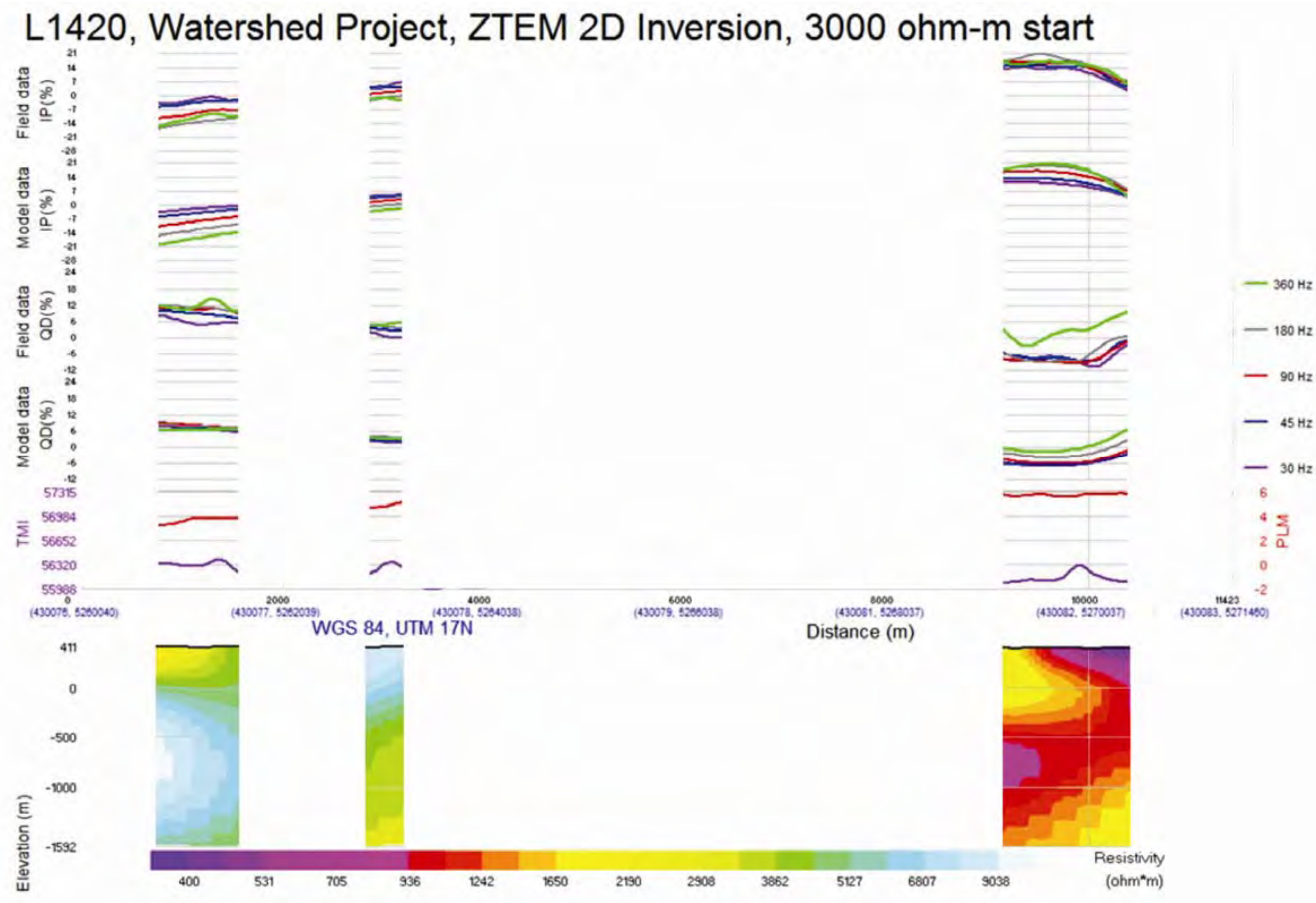


L1360, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

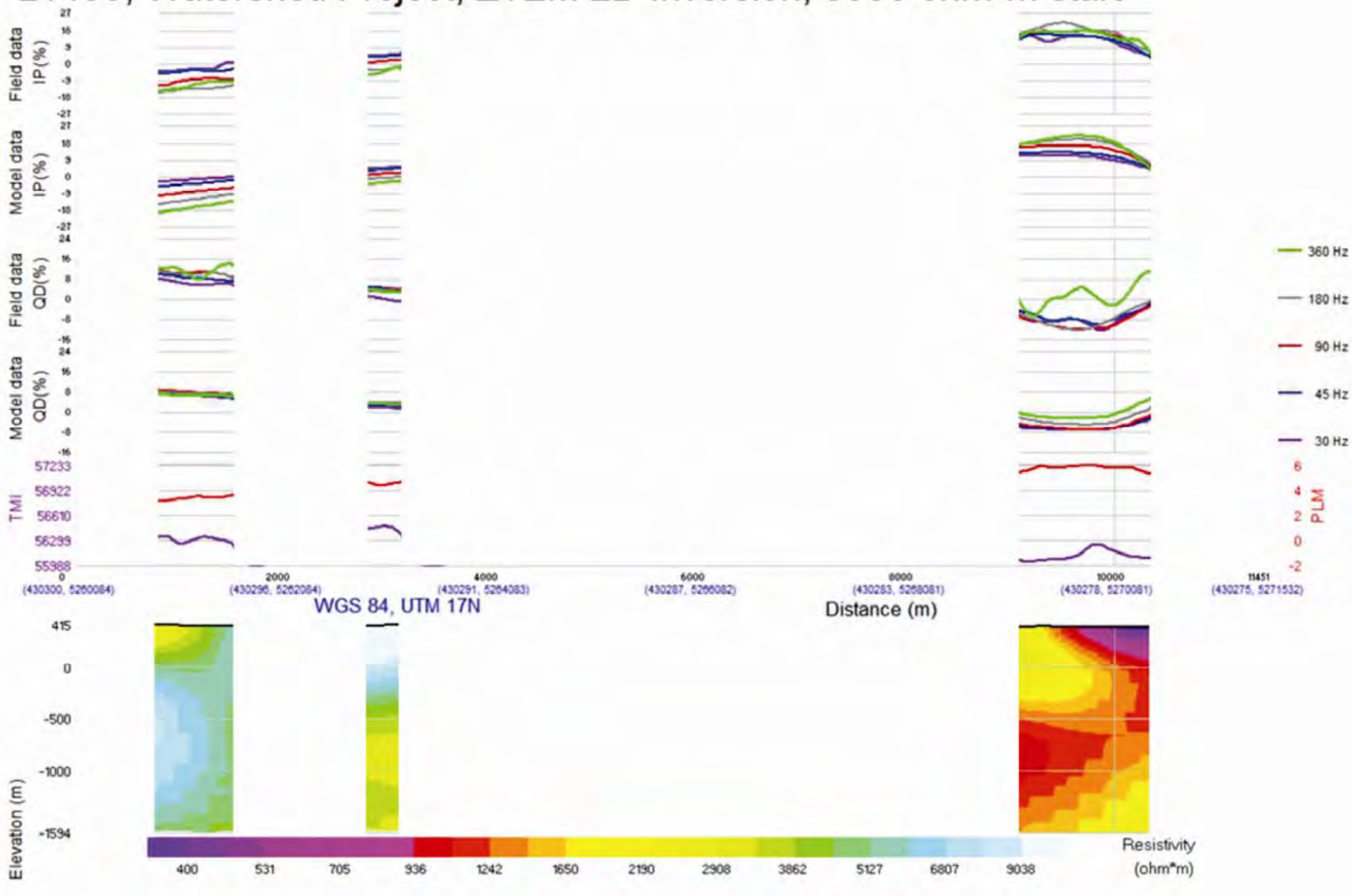
L1380, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start



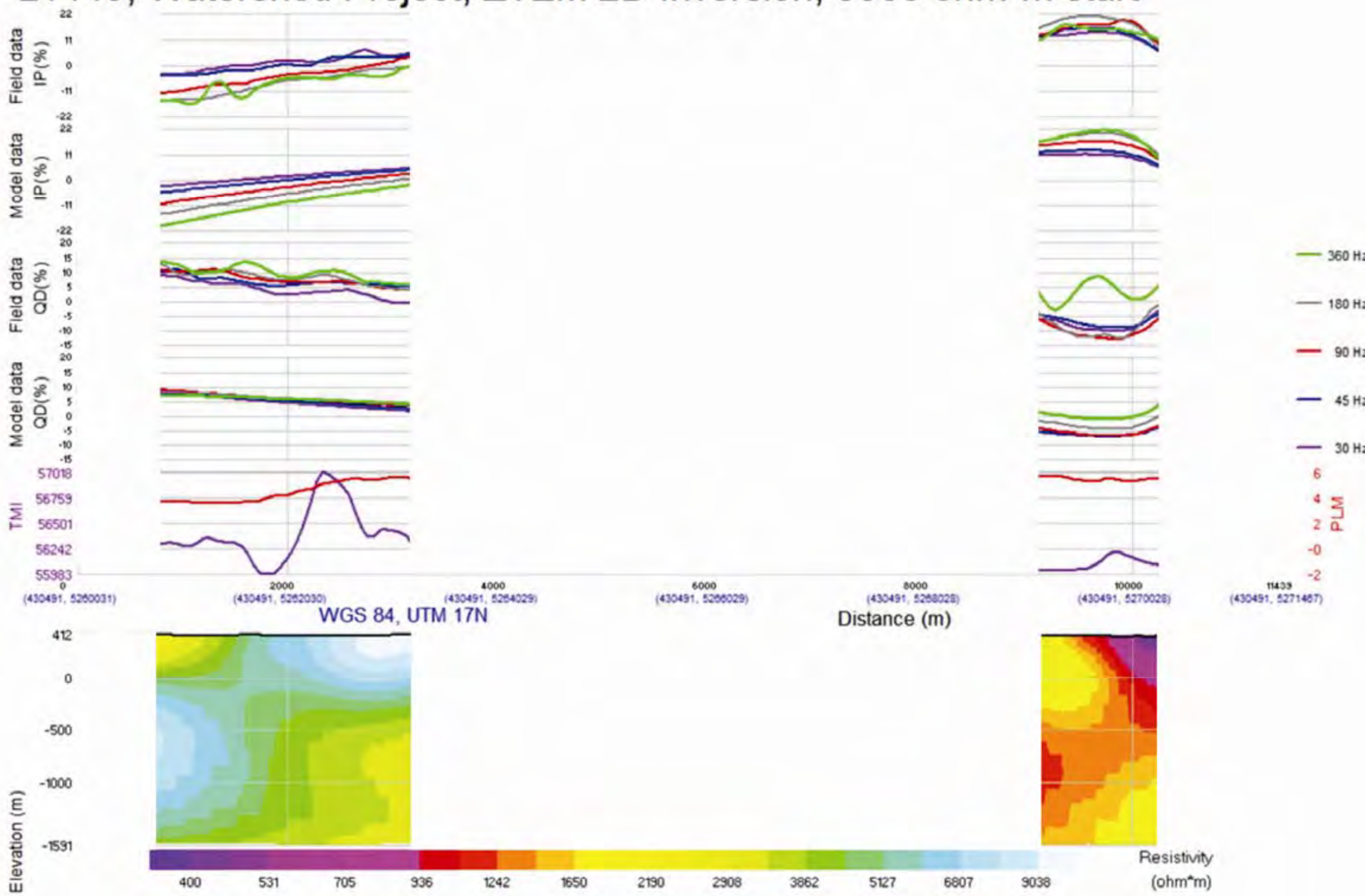

L1400, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

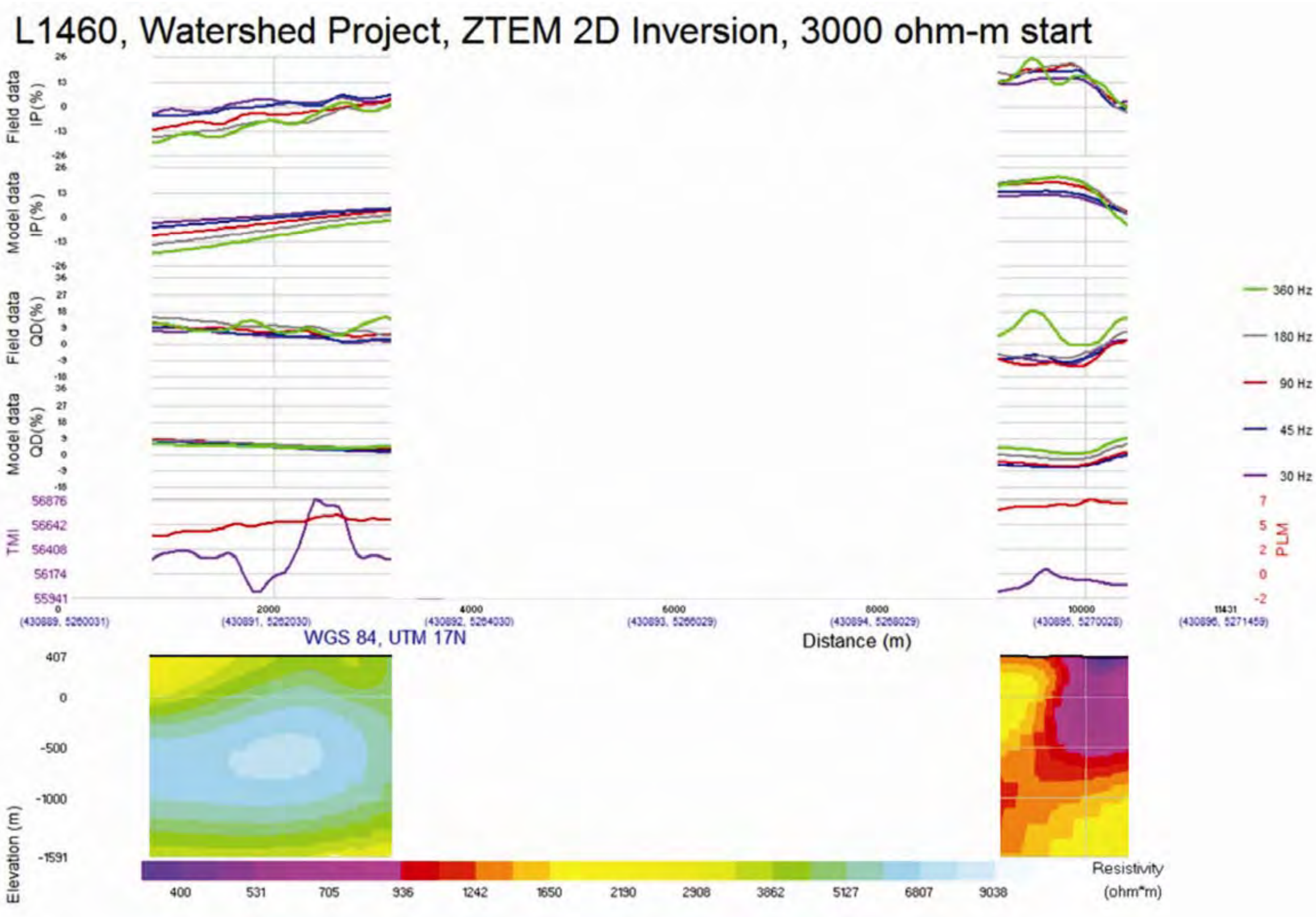

L1420, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

L1430, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start



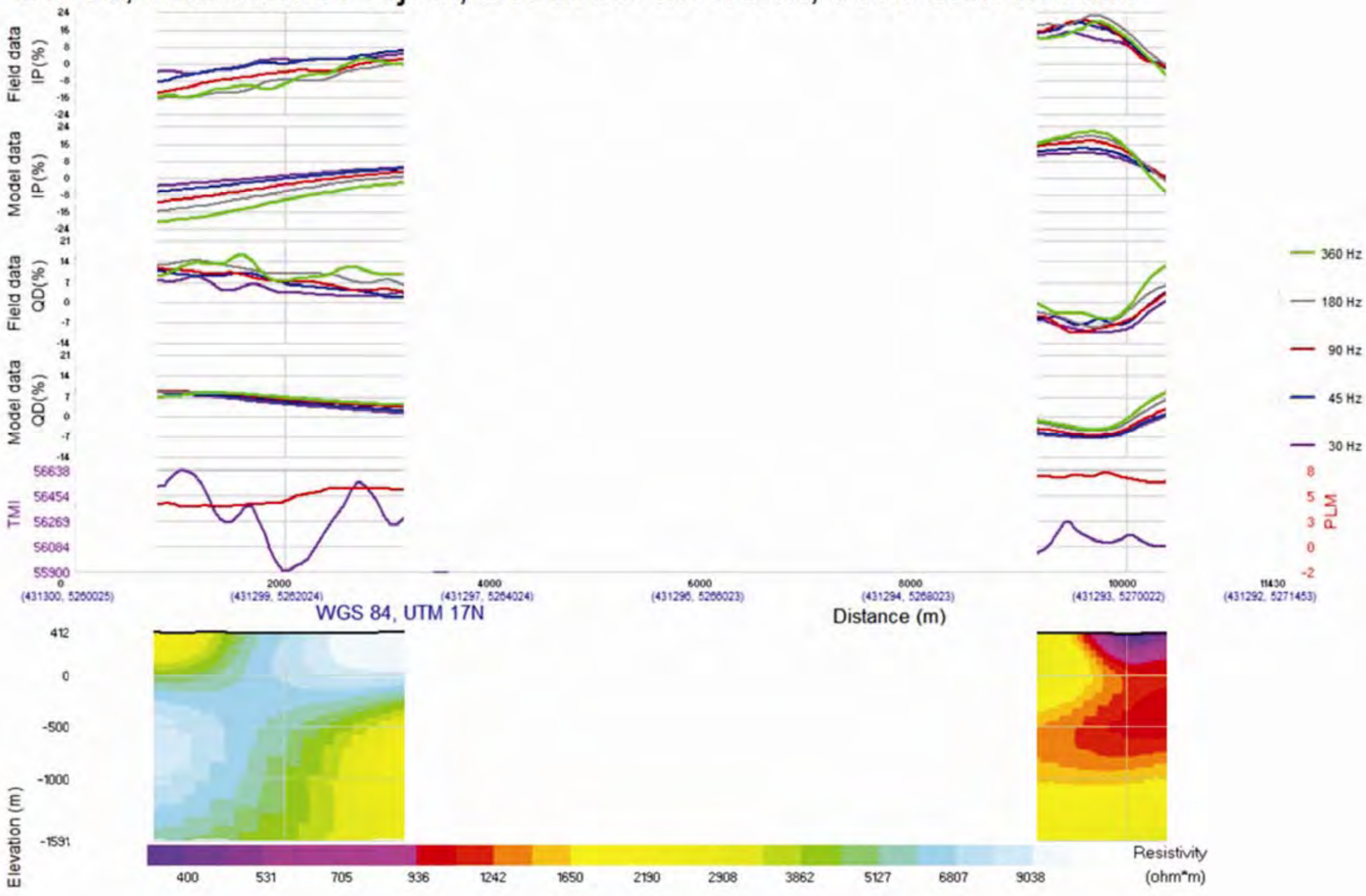
L1440, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start

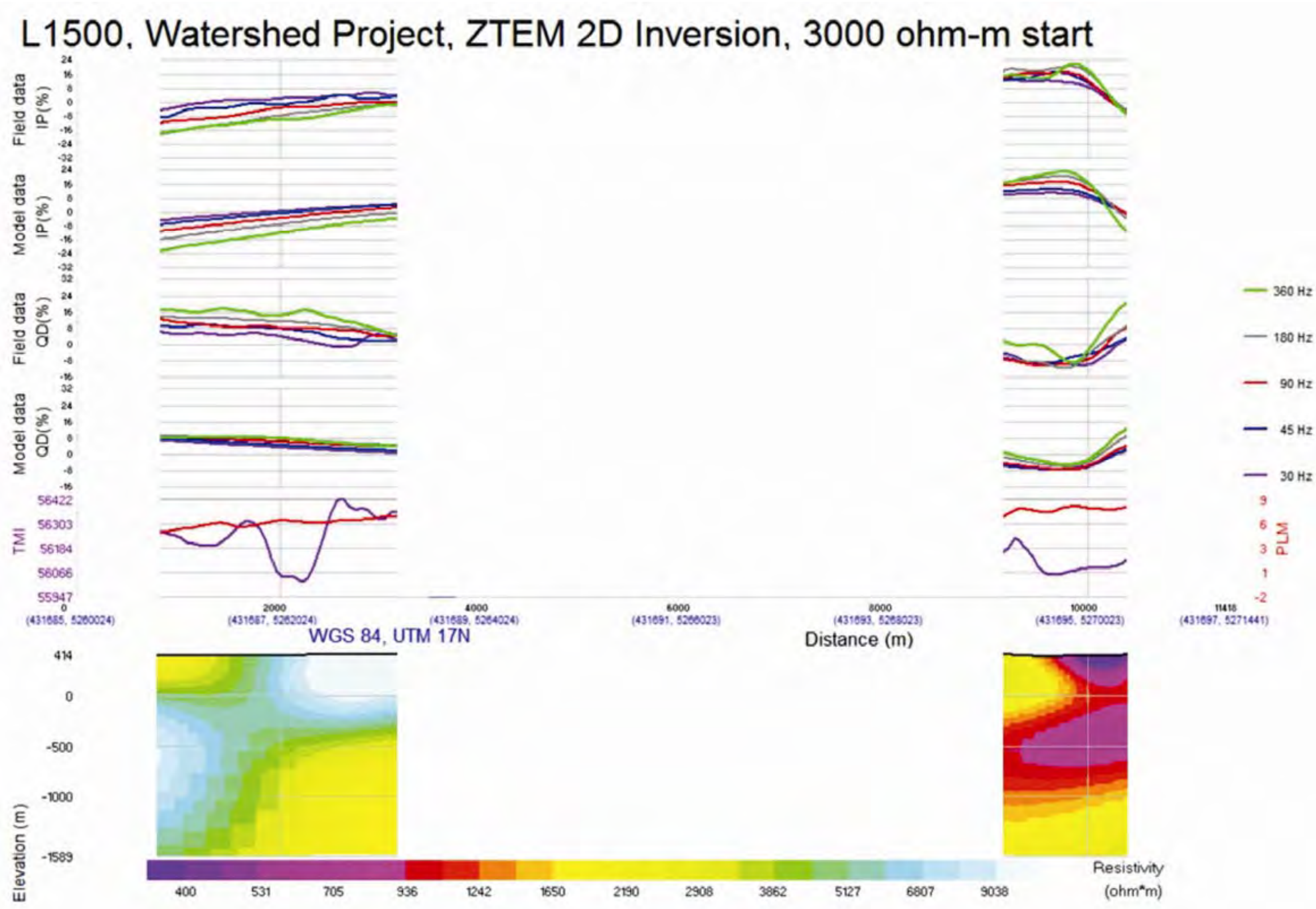




L1460, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

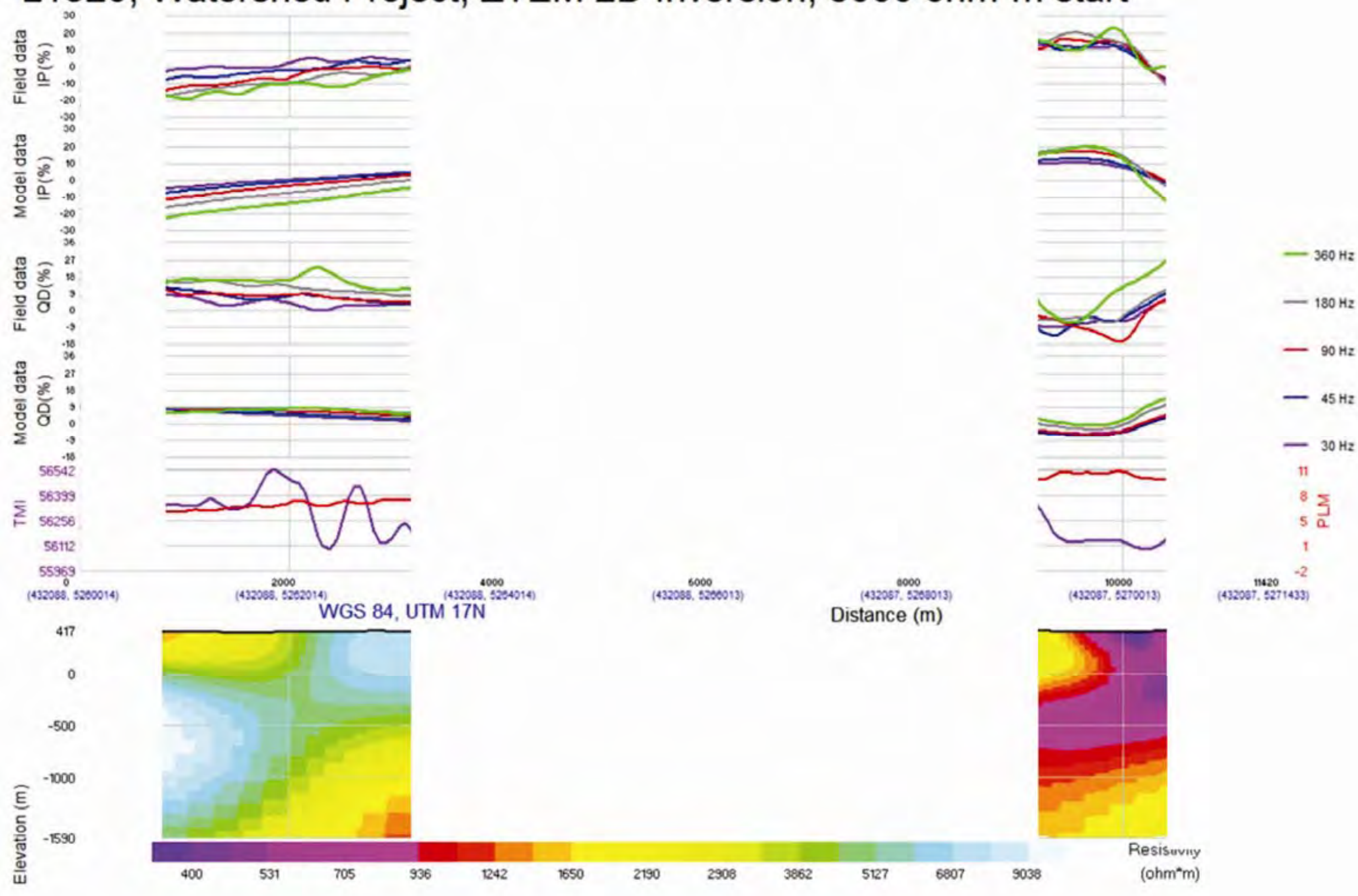
L1480, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start

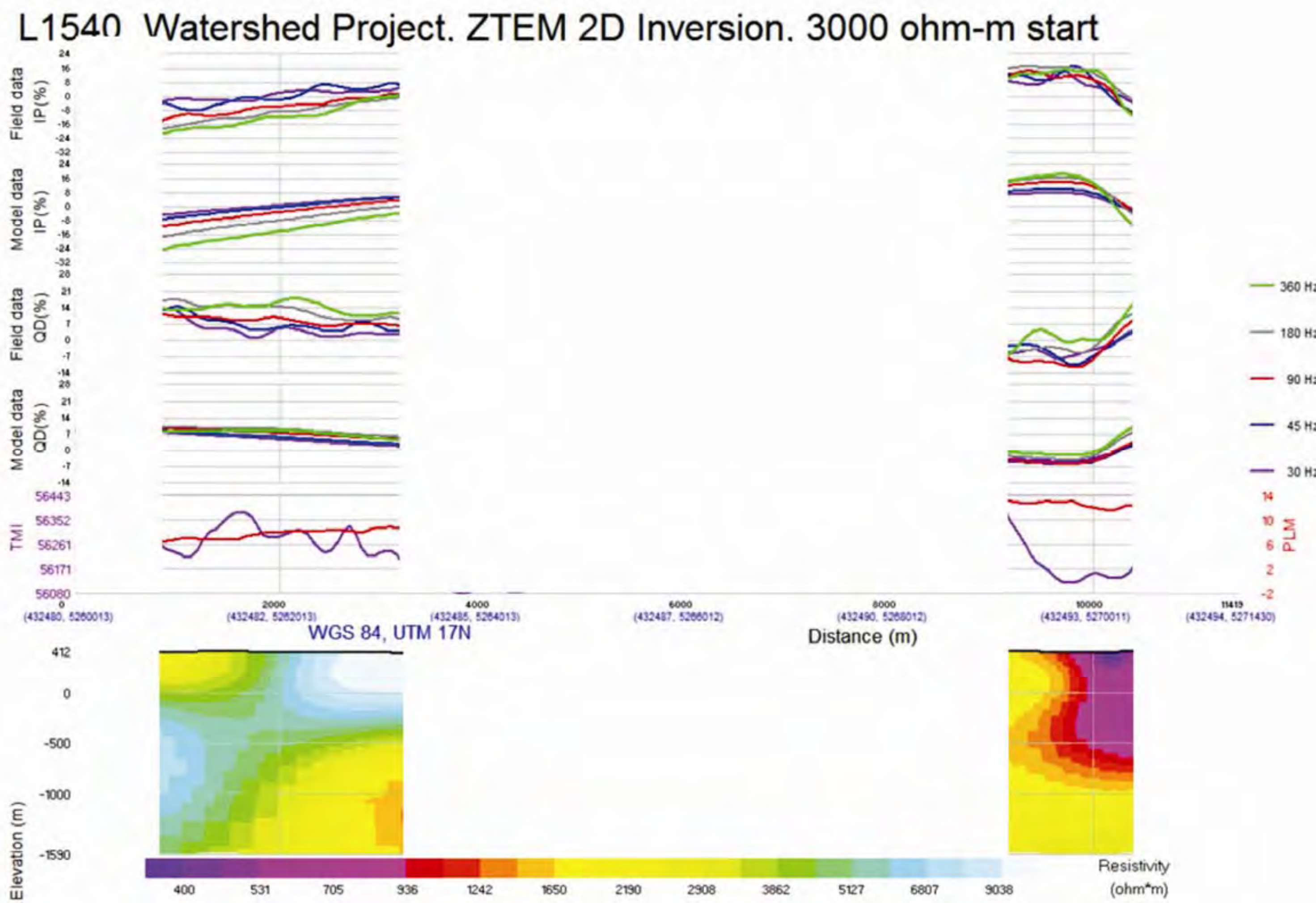




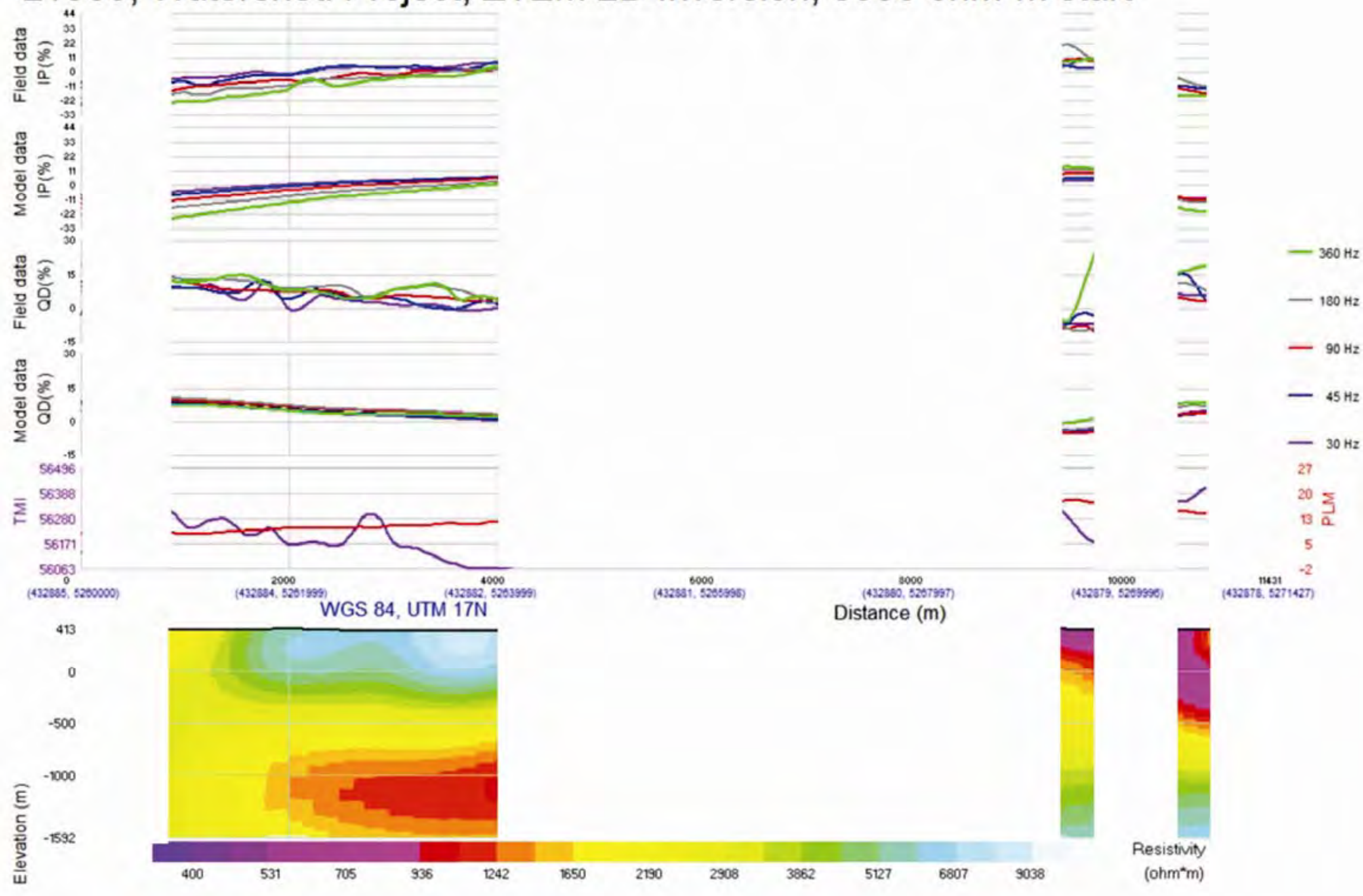
L1500, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)

L1520, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start

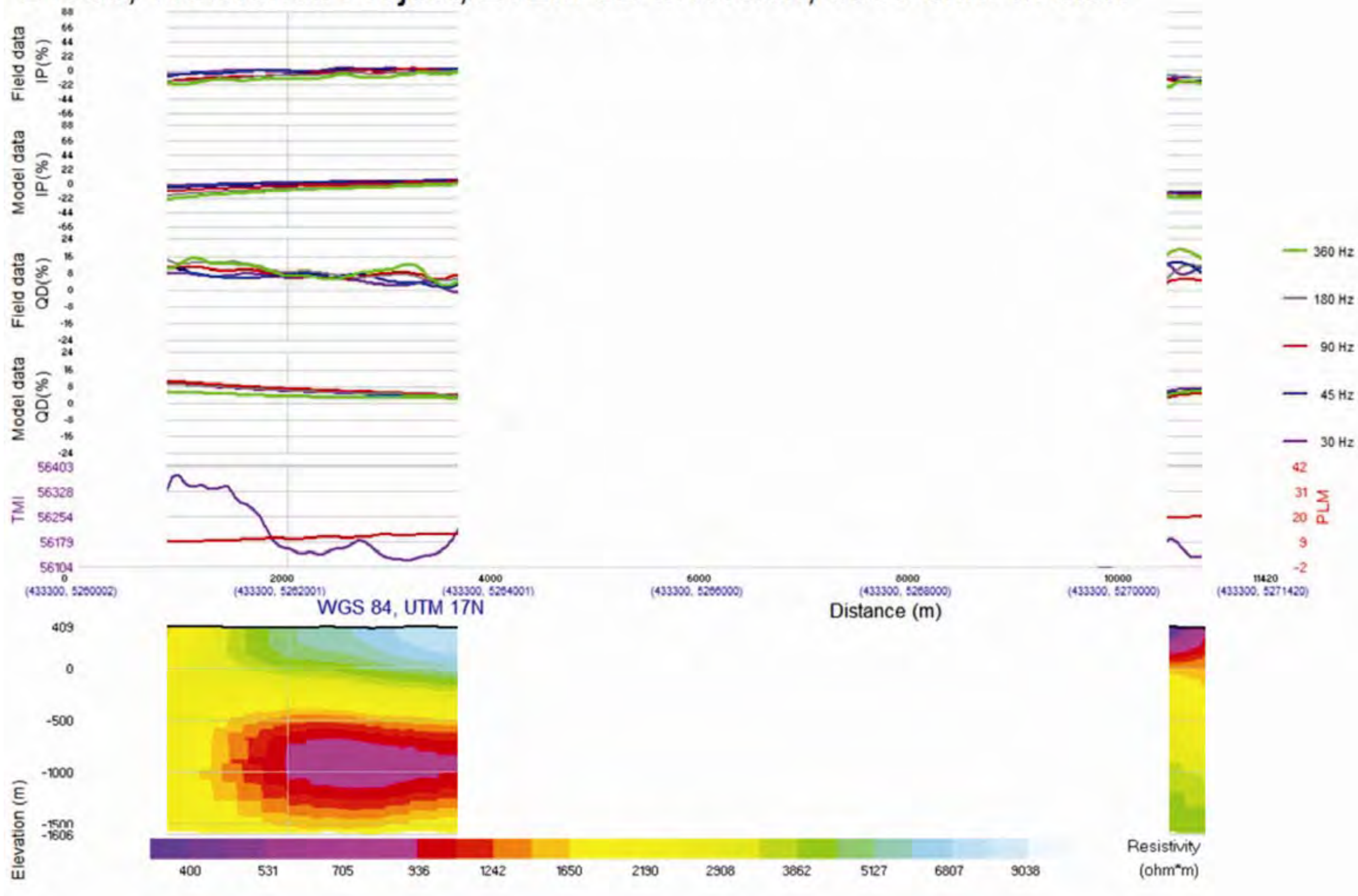



L1540 Watershed Project. ZTEM 2D Inversion. 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)
400
531
705
936
1242
1650
2190
2908
3862
5127
6807
9038

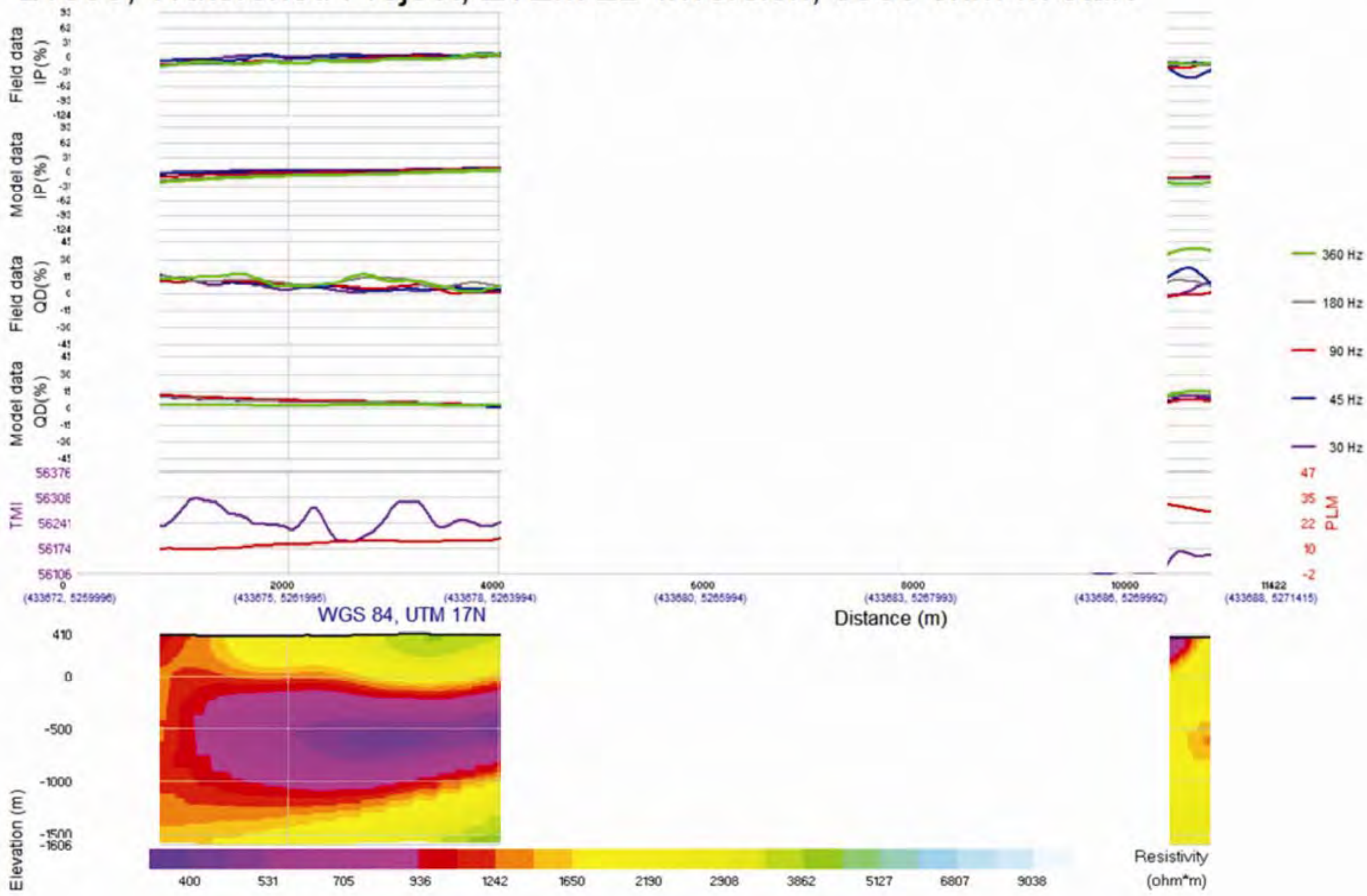
L1560, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start



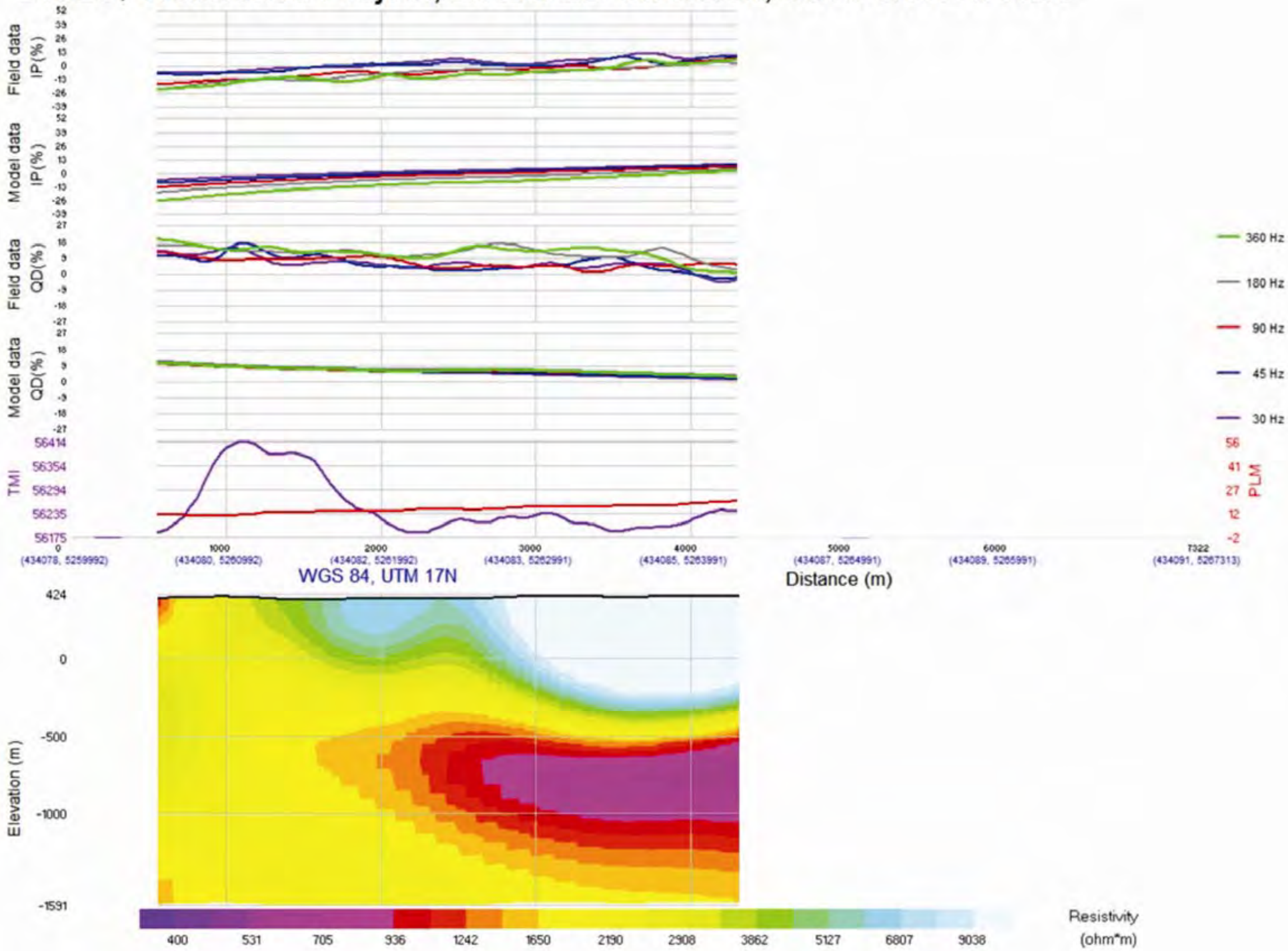
L1580, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start

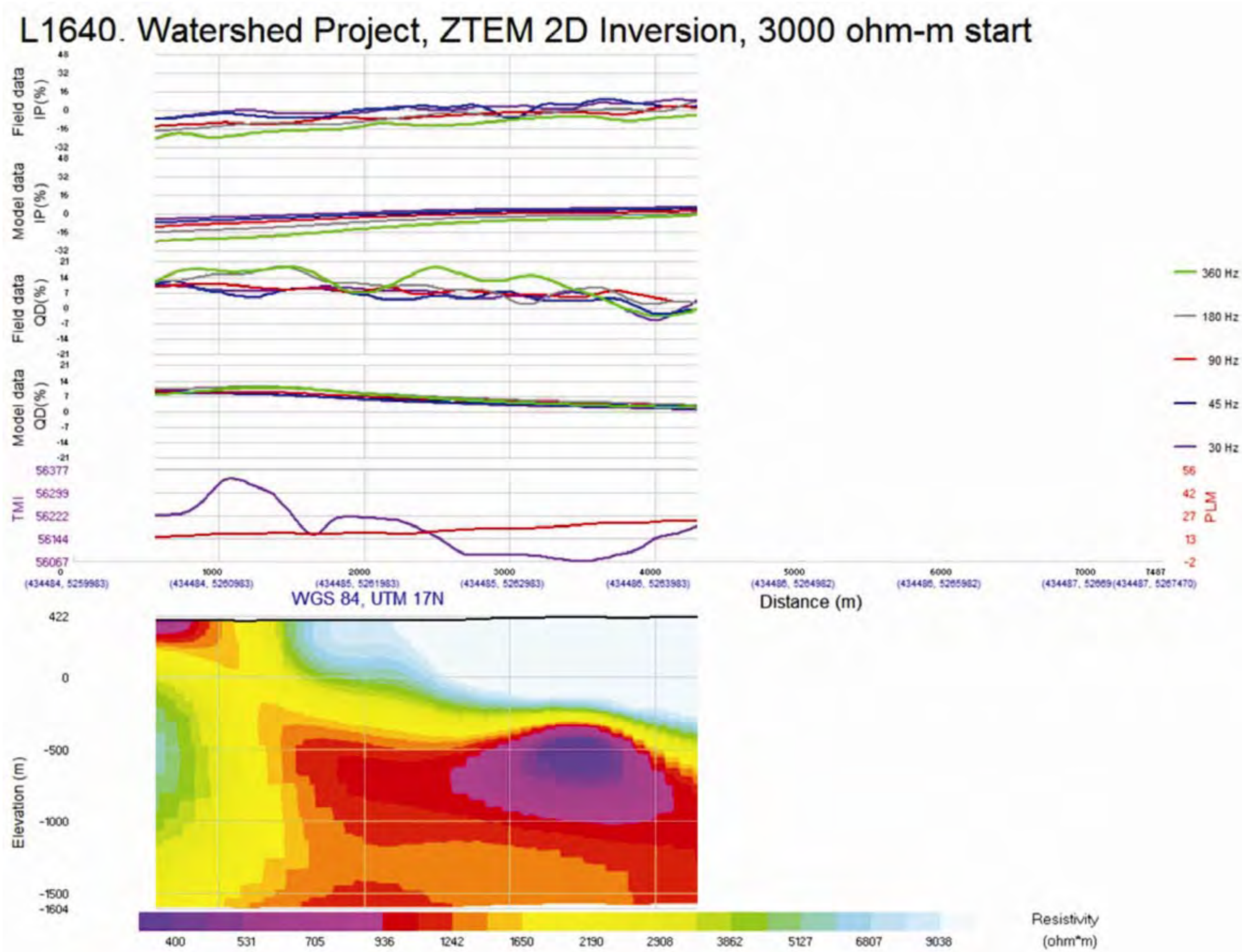


L1600, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start

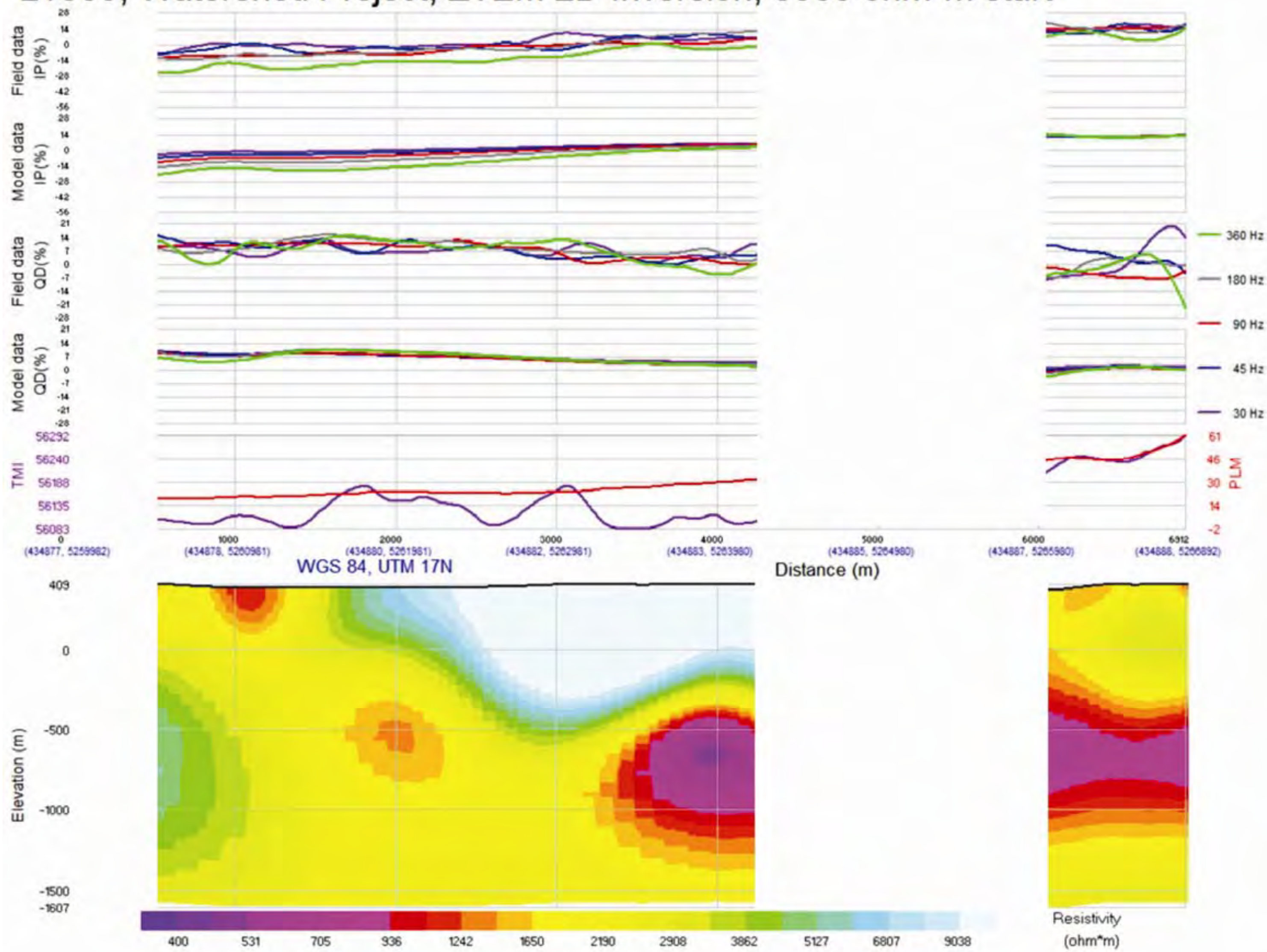


L1620, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start




L1640. Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start
Field data IP(%)
Model data IP(%)
Field data QD(%)
Model data QD(%)
TMI
PLM
360 Hz
180 Hz
90 Hz
45 Hz
30 Hz
WGS 84, UTM 17N
Distance (m)
Elevation (m)
Resistivity (ohm*m)

L1660, Watershed Project, ZTEM 2D Inversion, 3000 ohm-m start



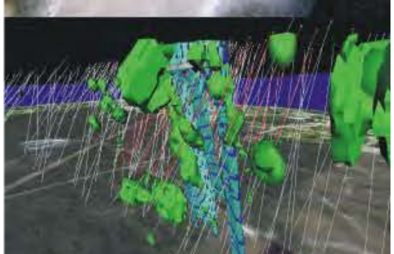
Appendix 4

Structural Interpretation










Structural Interpretation Report

Watershed Gold Property

Ontario, Canada

Sanatana Resources Inc.
1925-925 West Georgia Street
Vancouver, British Columbia, Canada
V6C 3L2

Original Date: 11 November 2011

Amended Date: 19 June 2012

Prepared By:

Caracle Creek International Consulting Inc.
Jenna McKenzie, Hon.B.Sc., P.Geo
Stephen Wetherup, B.Sc., P.Geo

Office Locations

Toronto
34 King Street East, 9th Floor
Toronto, ON
Canada, M5C 2X8

Tel: +1.416.368.1801
Fax: +1.416.368.9794
CDNops@cciconline.com

Vancouver
409 Granville Street, Suite 1409
Vancouver, BC
Canada, V6C 1T2

Tel: +1.604.637.2050
Fax: +1.604.602.9496
CDNops@cciconline.com

Sudbury
25 Frood Road
Sudbury, ON
Canada, P3C 4Y9

Tel: +1.705.671.1801
TF: +1.866.671.1801
Fax: +1.705.671.3665
CDNops@cciconline.com

Johannesburg
7th Floor
The Mall Offices
11 Cradock Avenue, Rosebank
South Africa

Tel: +1.27 (0) 11.880.0278
Fax: +1.27 (0) 11.447.4814
SAops@cciconline.com

www.caraclecreek.com

This report has been prepared by
Caracle Creek International Consulting Inc. (Caracle Creek)
on behalf of Sanatana Resources Inc.

2012

Issued by: Toronto Office

TABLE OF CONTENTS

Figures

TABLES

1.0 INTRODUCTION

At the request of Sanatana Resources Inc. ("Sanatana"), Caracle Creek International Consulting ("Caracle Creek") has conducted a structural review of the Watershed Gold Property to better understand the structural setting in and around the adjacent mineralized deposits and to extrapolate this understanding to the Watershed claim block.

The datasets used in this study are the Fugro DIGHEM data flown for Augen Gold Corp in 2007 and the Geotech ZTEM survey flown for Sanatana Resources in 2011. In addition, Caracle Creek has conducted a 40 line-km EarthProbe DCIP surface survey extending south west of the known Cote Lake deposit and on adjacent claims known to be of high interest. The results from this structural review will be incorporated with the EarthProbe interpretation and integrated recommendations will be formed.

2.0 GEOLOGICAL SETTING, MINERALIZATION AND DEPOSIT TYPE

The following geological description of the Watershed Gold Property is summarized from the February 14th, 2011 Independent Technical Report, prepared by Ronacher et al.

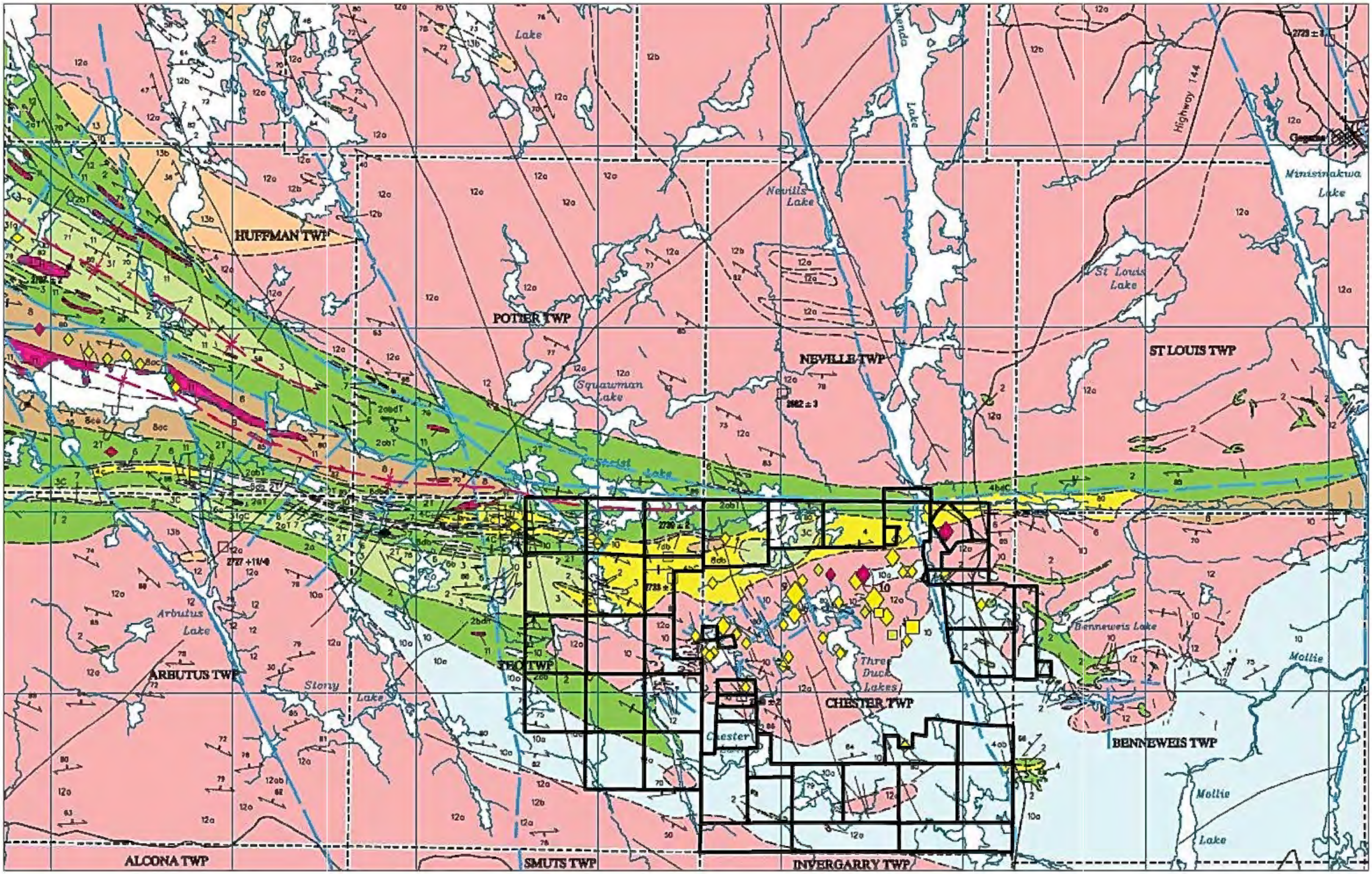
The Watershed Gold Property lies within the Swayze Greenstone Belt, which is part of the Western Abitibi Subprovince of the Superior Province. The age of the Abitibi Subprovince is between 2.75 and 2.67 Ga (Ronacher et al, 2011). This belt is interpreted to represent a deeper erosional level of the Abitibi Greenstone Belt. The southern Swayze Greenstone Belt is an ESE-trending syncline that extends from Ester to Brunswick townships. The outer limb of the syncline is composed of tholeiitic flows of greenschist facies. The inner part of the syncline is composed of tholeiitic and calc-alkaline metavolcanic rocks; and the core is composed of clastic metasediments that are the youngest rocks in the structure. Metasedimentary rocks occur in the west part of the belt and are intruded by the Jerome Porphyry (unit 11 in regional geology map, Figure 2-1). Iron formation and subvolcanic gabbroic rocks are also present in the southern Swayze Greenstone Belt.

The Swayze Greenstone Belt has undergone polyphase folding, development of multiple foliation generations, high-strain zones and late brittle faulting. Eight major subparallel, sinistral NNW-trending and several NE-trending faults offset the syncline. Younger diabase dykes also strike NNW and NE to a lesser extent. Most of the rocks in the Swayze Greenstone Belt have undergone greenschist facies metamorphism. Amphibolite facies metamorphism is limited to the contact aureoles of felsic intrusion.

The Watershed Gold Property is underlain by the northern and southern limb of the syncline forming the Swayze Greenstone Belt. The eastern part and southern corner of the felsic pluton of the Chester Granitoid complex underlies the Chester, Yeo and Benneweis townships and hosts several gold occurrences mostly to the north of the Property boundary; and mafic intrusive rocks in the Chester Granitoid Complex surrounding the felsic pluton.

The Swayze Greenstone Belt is prospective for orogenic gold deposits ("shear zone hosted", "mesothermal", "greenstone-hosted quartz-carbonate vein" deposit). These deposits occur in deformed greenstone belts, particularly those that are characterized by tholeiitic basalts and ultramafic komatiites intruded by intermediate to felsic porphyritic intrusions. They are located along major compressional to transtensional crustal-scale fault zones marking convergent margins between major units but ore is typically hosted by second- and third order shears and faults and at jogs and changes in strike.

The Chester Gold occurrence (MNDMF Chester Gold Occurrence, 2005) is located in the southern Chester area of the Watershed Gold Property within the Chester Granitoid Complex (Figure 2-3). Gold is hosted by quartz veins in a stockwork of joints in granites of the Chester Granitoid Complex trending parallel to diabase dikes. In 1993, massive pyrite and visible gold was reported in the veins. However most of the pyrite is disseminated. Grab sample collected by the OGS in 1994 returned 143.16 g/t Au and 7.5 g/t Ag.



Legend

Watershed Gold Property Claims

Location Text

N
W E
S

Scale

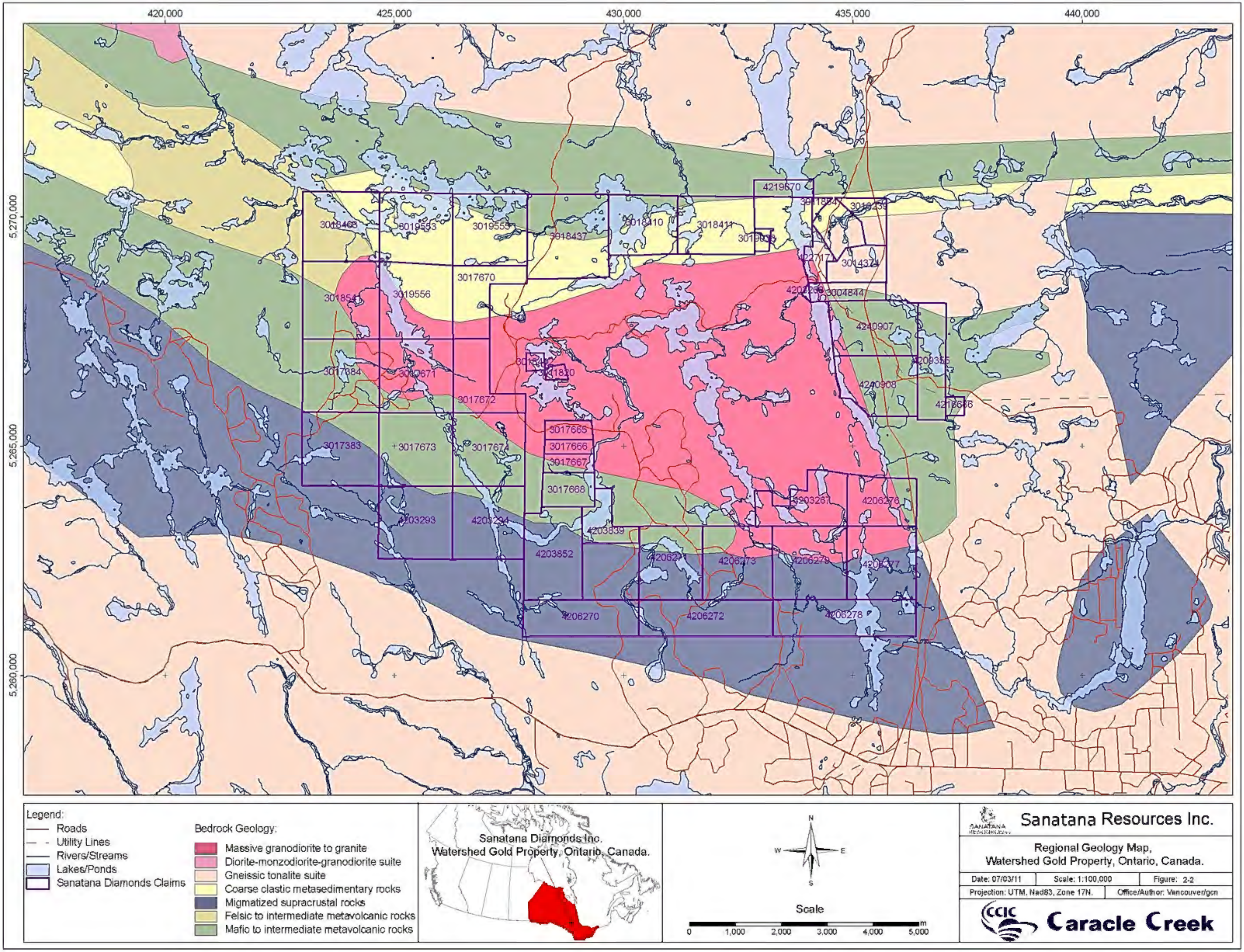
0 1 2 4 6 8 km

Sanatana Resources Inc.

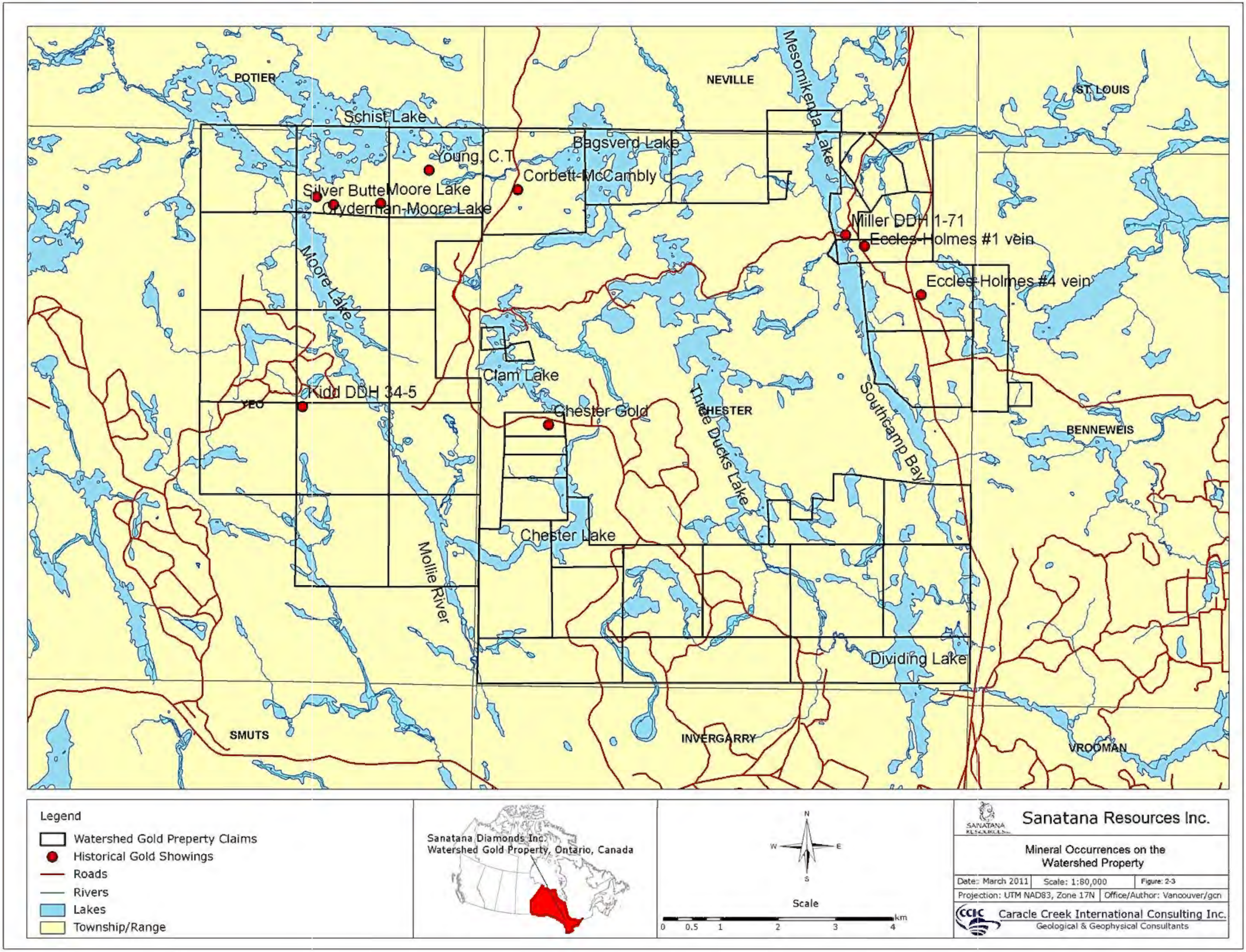
Canadian Location Map,
Goliath Project, Ontario, Canda.

Date: 02/07/09	Scale:	Figure: 2-1
Projection:		Office/Author: Vancouver/gcn

Caracle Creek International Consulting Inc.
Geological & Geophysical Consultants



420,000
425,000
430,000
435,000
440,000
5,270,000
5,265,000
5,260,000
Legend:
Roads
Utility Lines
Rivers/Streams
Lakes/Ponds
Sanatana Diamonds Claims
Bedrock Geology:
Massive granodiorite to granite
Diorite-monzodiorite-granodiorite suite
Gneissic tonalite suite
Coarse clastic metasedimentary rocks
Migmatized supracrustal rocks
Felsic to intermediate metavolcanic rocks
Mafic to intermediate metavolcanic rocks
Sanatana Diamonds Inc.
Watershed Gold Property, Ontario, Canada.
N
W
E
S
Scale
0
1,000
2,000
3,000
4,000
5,000
m
Sanatana Resources Inc.
Regional Geology Map,
Watershed Gold Property, Ontario, Canada.
Date: 07/03/11
Scale: 1:100,000
Figure: 2-2
Projection: UTM, Nad83, Zone 17N.
Office/Author: Vancouver/gcn
Caracle Creek


POTIER
NEVILLE
ST. LOUIS
Schist Lake
Bagsverd Lake
Mesomikenda Lake
Young, C.T
Corbett-McCambly
Silver Butte
Moore Lake
Clyderman-Moore Lake
Miller DDH 1-71
Eccles-Holmes #1 vein
Eccles-Holmes #4 vein
Moore Lake
Clam Lake
Kidd DDH 34-5
YEO
Chester Gold
CHESTER
Three Ducks Lake
Southcamp Bay
BENNEWEIS
Chester Lake
Mollie River
Dividing Lake
SMUTS
INVERGARRY
VROOMAN
Legend
Watershed Gold Property Claims
Historical Gold Showings
Roads
Rivers
Lakes
Township/Range
Sanatana Diamonds Inc.
Watershed Gold Property, Ontario, Canada
N
W
E
S
Scale
0 0.5 1 2 3 4 km
Sanatana Resources Inc.
Mineral Occurrences on the Watershed Property
Date: March 2011
Scale: 1:80,000
Figure: 2-3
Projection: UTM NAD83, Zone 17N
Office/Author: Vancouver/gcn
Caracle Creek International Consulting Inc.
Geological & Geophysical Consultants

3.0 STRUCTURAL ANALYSIS

3.1 Method

The structural analysis method employed in this report consists of three stages: Observation, Compilation and Interpretation. Airborne magnetic data was filtered to produce various products highlighting different structures; key observations were recorded and interpreted in a large-scale context. All postulated structures and domain settings were evaluated for their relationship to mineralization. Known mineralized zones located on the adjacent Trelawney – Chester claims were digitized from public information found on the Trelawney Mining website (www.trelawneymining.com/chester).

The airborne magnetic dataset clipped from the Gogama DIGHEM survey flown in 2007 was primarily used for the observations. The first vertical derivative of the magnetic data was used to create observed form lines. The ZTEM resistivity model, provided by Geotech Ltd., was also reviewed in context with the magnetic data.

3.2 Observations - Magnetics

Raw observations were recorded from the total magnetic field and first vertical derivative ("1VD") (Figure 3-1 and Figure 3-3). This exercise primarily gives a sense of the major trends of the data and begins the process of highlighting subtle but significant structures.

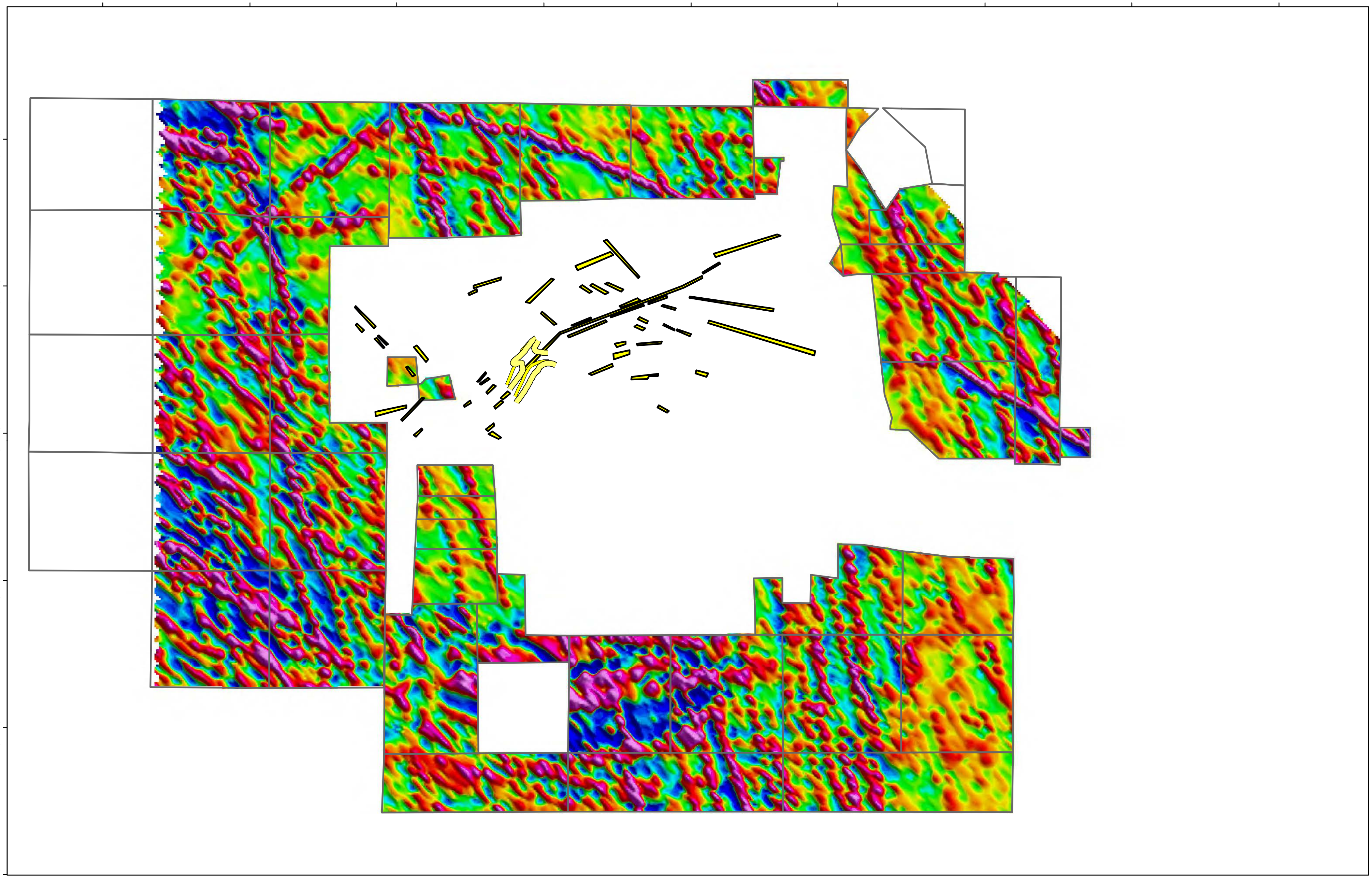
Figure 3-2 illustrates the observations from the 1VD and demonstrates that the magnetics are dominated by a 160 ^{o} trending dyke swarm (light grey) postulated to be the Matachewan and Hearst swarms. This is crosscut by a younger 110 ^{o} (orange) Sudbury swarm. The oldest trend at 45^{o} (red) is found in the north-western portion of the survey and is interpreted to be the Preissac swarm (MNDMF, 2000).

Table 3-1. Dyke swarms observed in the magnetic data

Order (Oldest – Youngest)	Age	Orientation	Colour
Preissac swarm	1.6 – 2.5 Ga	45^{o}	Red
Matachewan and Hearst	1.6 – 2.5 Ga	160^{o}	Grey
Sudbury swarm	0.9 – 1.6 Ga	110^{o}	Orange

Figure 3-4 demonstrates observations from the total magnetic intensity ("TMI"). Several packages of alternating contrasts between quiet and active magnetics are noted. A large intrusion is interpreted in the southern portion of the survey. This is not currently reflected in the regional bedrock geology mapping.

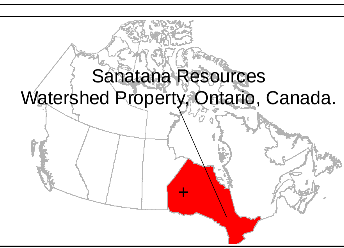
The apparent resistivity datasets from the Gogama DIGHEM survey were examined at 56 kHz, 7200 Hz and 900 Hz. The moderate and low frequency apparent resistivity only shows a linear conductive anomaly in the east coincident with a major power line. No other structural information was noted.



Legend:

Trewlaney Mineralized Zones

Land Tenure



N
W
E
S

Scale

0 | 0.95 | 1.9 | 2.85 km

Sanatana Resources Inc.

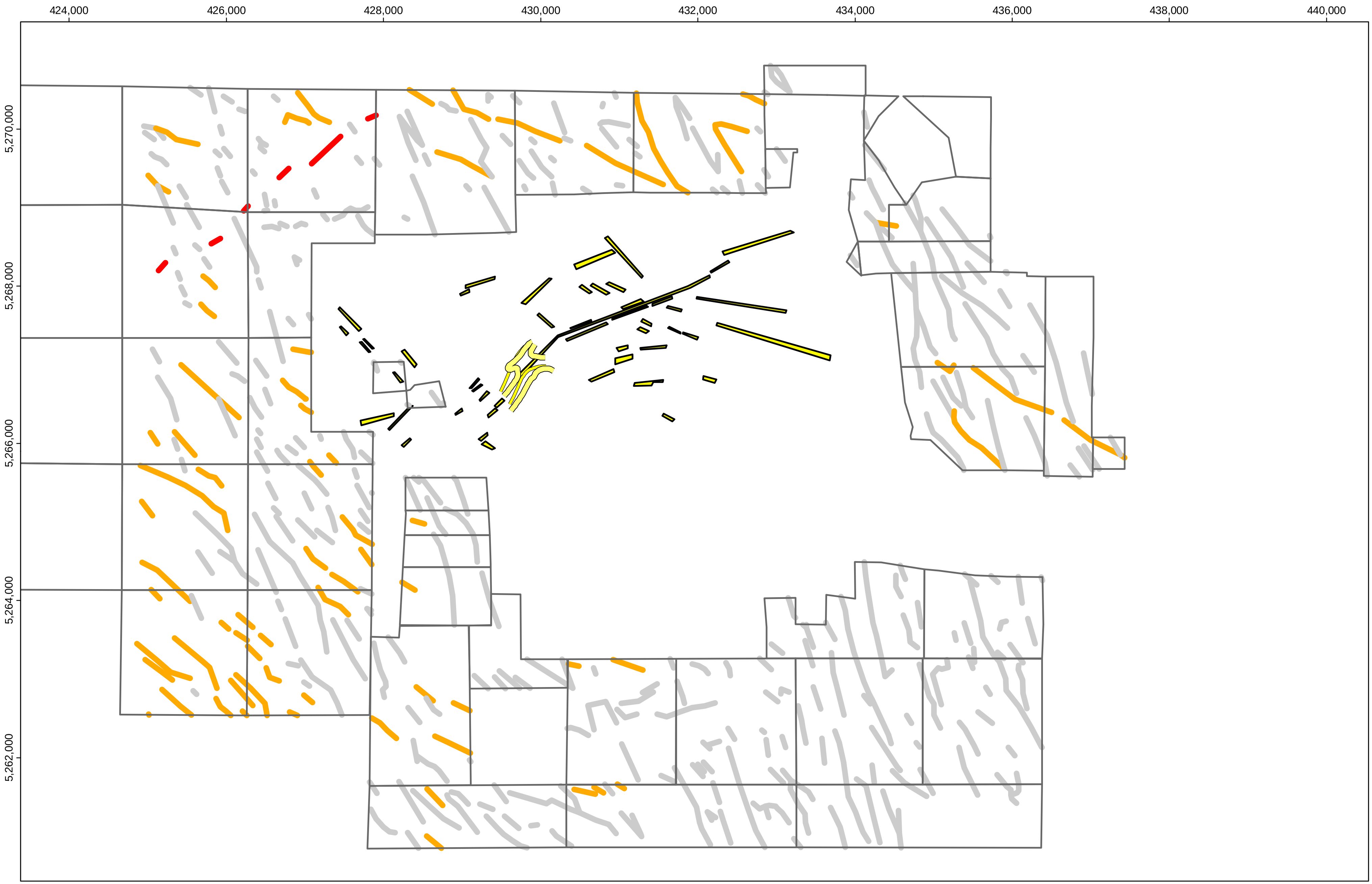
First Vertical Derivative (1VD)

Structural Interpretation - Watershed Project

Date: 10/24/11 | Scale: 1:65,000 | Figure: 3-1

Projection: UTM, Nad83, Zone 17N. | Office/Author: Toronto/jpm

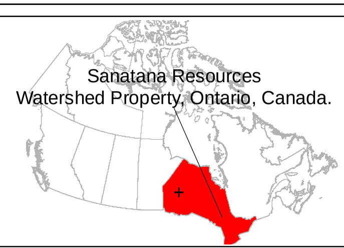
Caracle Creek

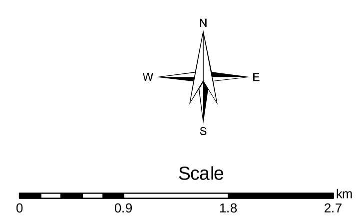


Legend:

Observations by Azimuth

- 45 degrees
- 110 degrees
- 160 degrees
- Trewlaney Mineralized Zones
- Land Tenure



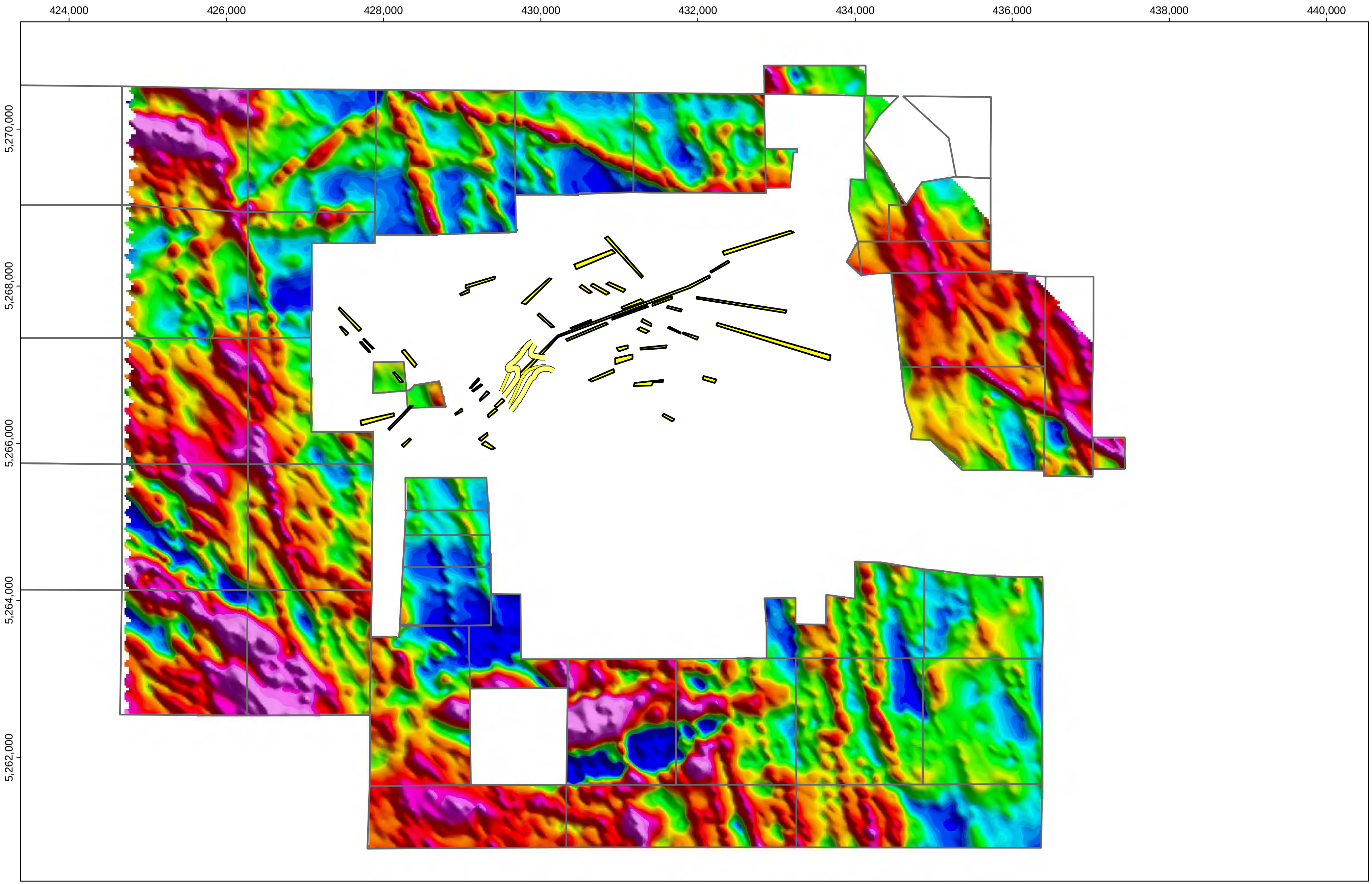


Sanatana Resources Inc.

Observations from 1VD
Structural Interpretation - Watershed Project

Date: 10/24/11	Scale: 1:65,000	Figure: 3-2
Projection: UTM, Nad83, Zone 17N.	Office/Author: Toronto/jpm	

Caracle Creek



Legend:
Trewlaney Mineralized Zones
Land Tenure

N
W
E
S

Scale

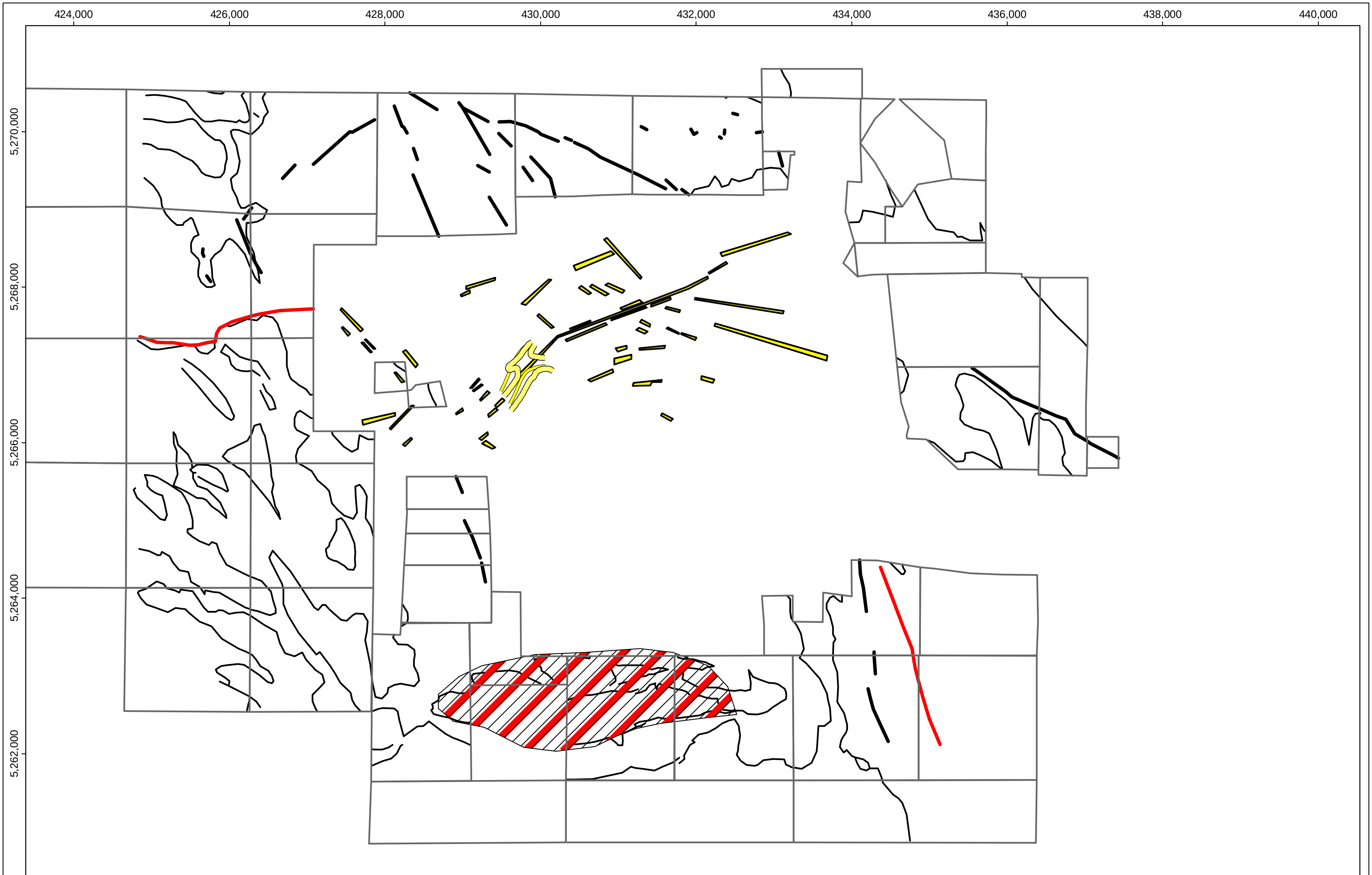
0 0.9 1.8 2.7 km

Sanatana Resources Inc.

Total Magnetic Intensity (TMI)
Structural Interpretation - Watershed Project

Date: 10/24/11	Scale: 1:65,000	Figure: 3-3
Projection: UTM, Nad83, Zone 17N.	Office/Author: Toronto/jpm	

Caracle Creek



Sanatana Resources Inc.

TMI - Observations and Interpreted Intrusions
Structural Interpretation - Watershed Project

Date: 10/24/11	Scale: 1:65,000	Figure: 3-4
Projection: UTM, Nad83, Zone 17N.	Office/Author: Toronto/jpm	

Caracle Creek

3.1 Observations – ZTEM

The ZTEM data was reviewed with assistance from Jean Legault of Geotech.

The ZTEM or Z Axis Tipper Electromagnetic system is an airborne audio-frequency magnetics ("AFMAG") system and is used primarily as a resistivity mapping tool (Geotech, 2011). Changes in the vertical magnetic field are measured along an extremely low frequency ("ELF") range of 30-360Hz. Lateral resistivity contrasts cause the electromagnetic field to tip vertically. ZTEM is sensitive to subtle resistive contrasts.

Several lines from the Sanatana ZTEM dataset were inverted by Geotech and examined in 3D (Figure 3-5). Several lines show a dipping conductor (Figure 3-6) with dips approximately 30°S. This feature may possibly be an artifact of the 2D inversion as the northern portion of the lines encounter a significant conductive contrast. The inversion would need to create this feature to compensate for the building conductivity response along line. However, this response is seen through all survey line inversions, lending evidence that it may be real and may represent a dipping geological contact. The central tie line shows support that this dipping conductor is real.

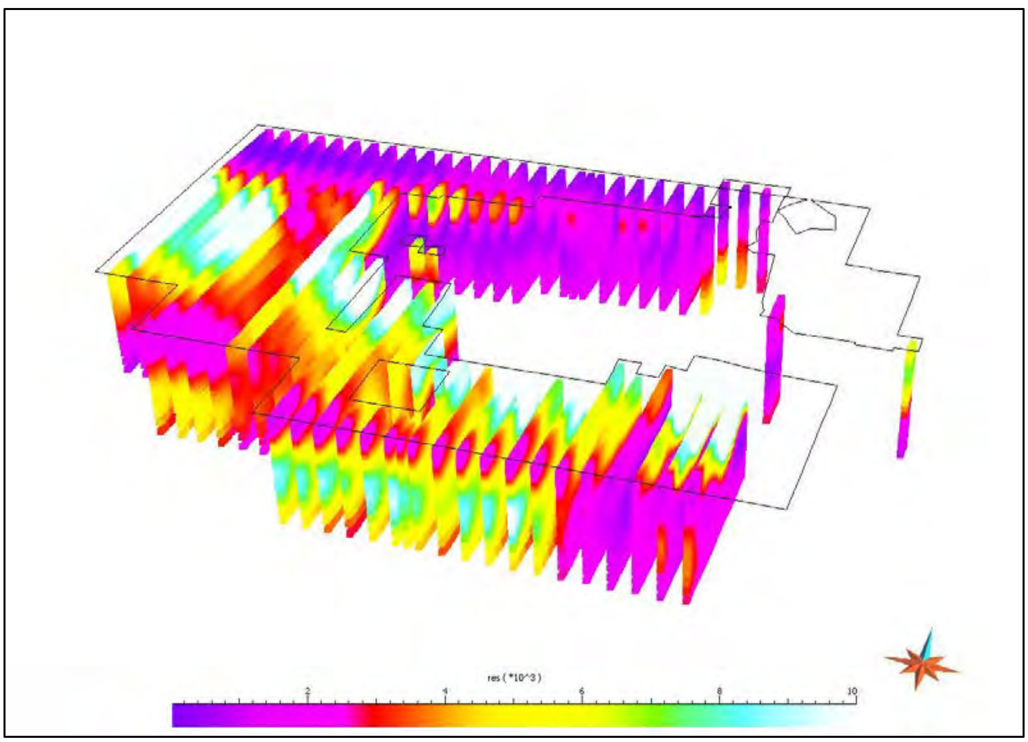


Figure 3-5. 2D line inversions of ZTEM apparent resistivity data

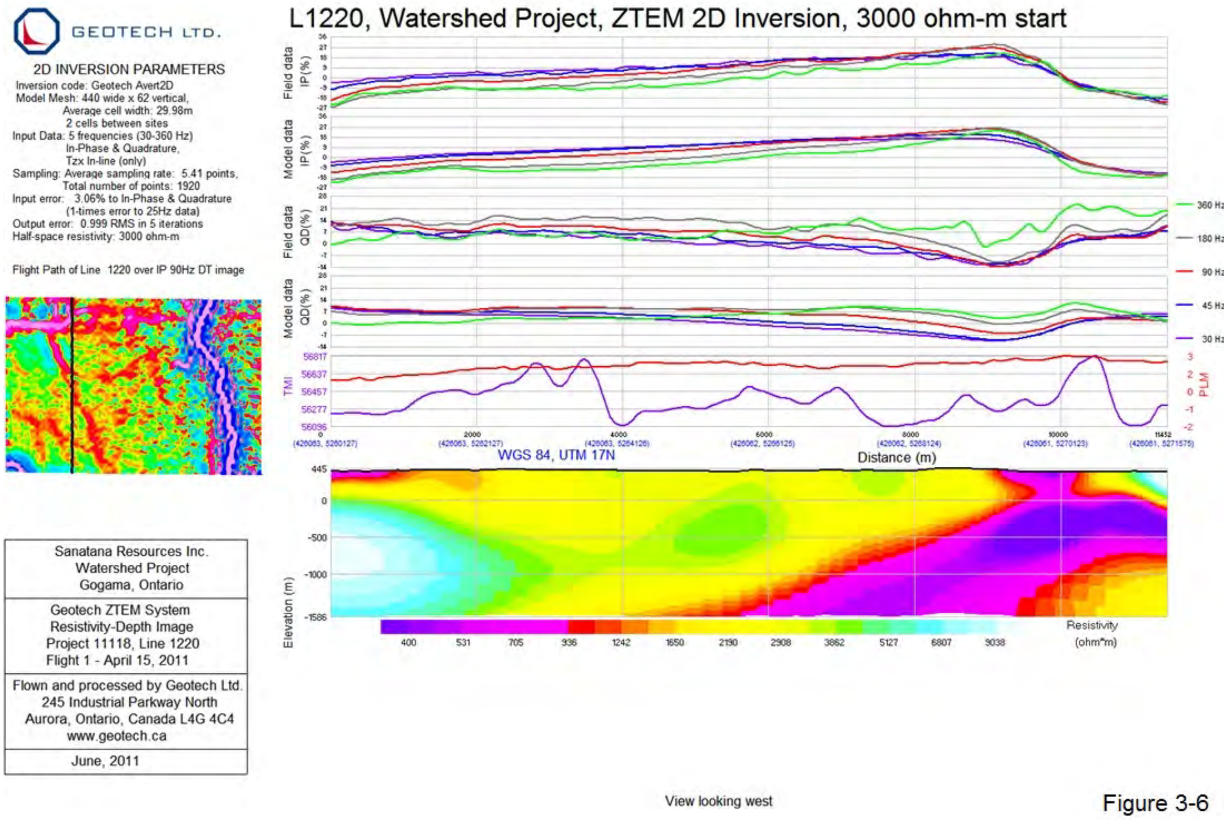


Figure 3-6. Example of the dipping conductive feature shown throughout the 2D inversions

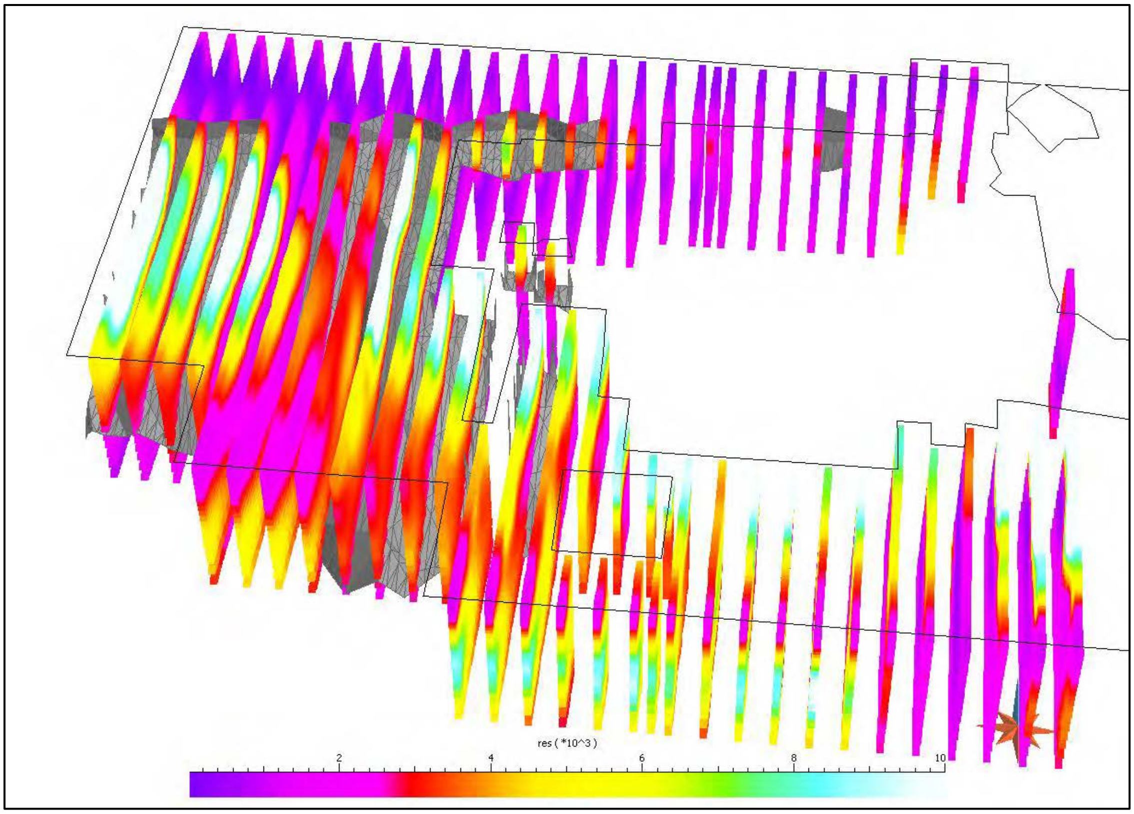
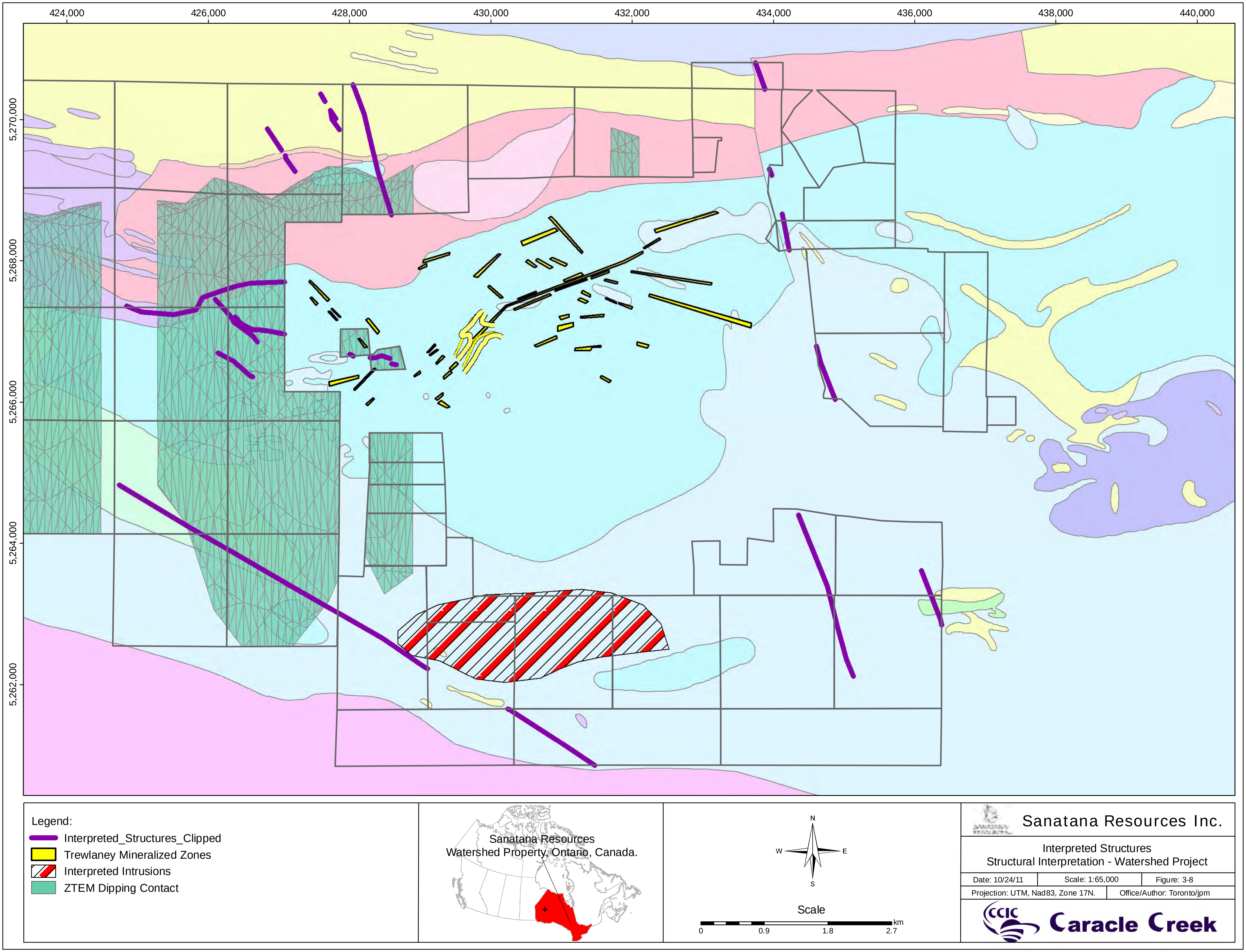


Figure 3-7. Dipping conduct shown in 3D (grey) in context of resistivity inversion

Figure 3-8 shows the extent of this dipping contact with respect to the bedrock geology. The northern edge of the contact is related to the contact between the mafic volcanics of the Trailbreaker group to the north and felsic volcanics of the Chester Group – Yeo formation to the south. This dip in geology may be related to the known dip of the limbs of the Swayze syncline and should be further investigated.

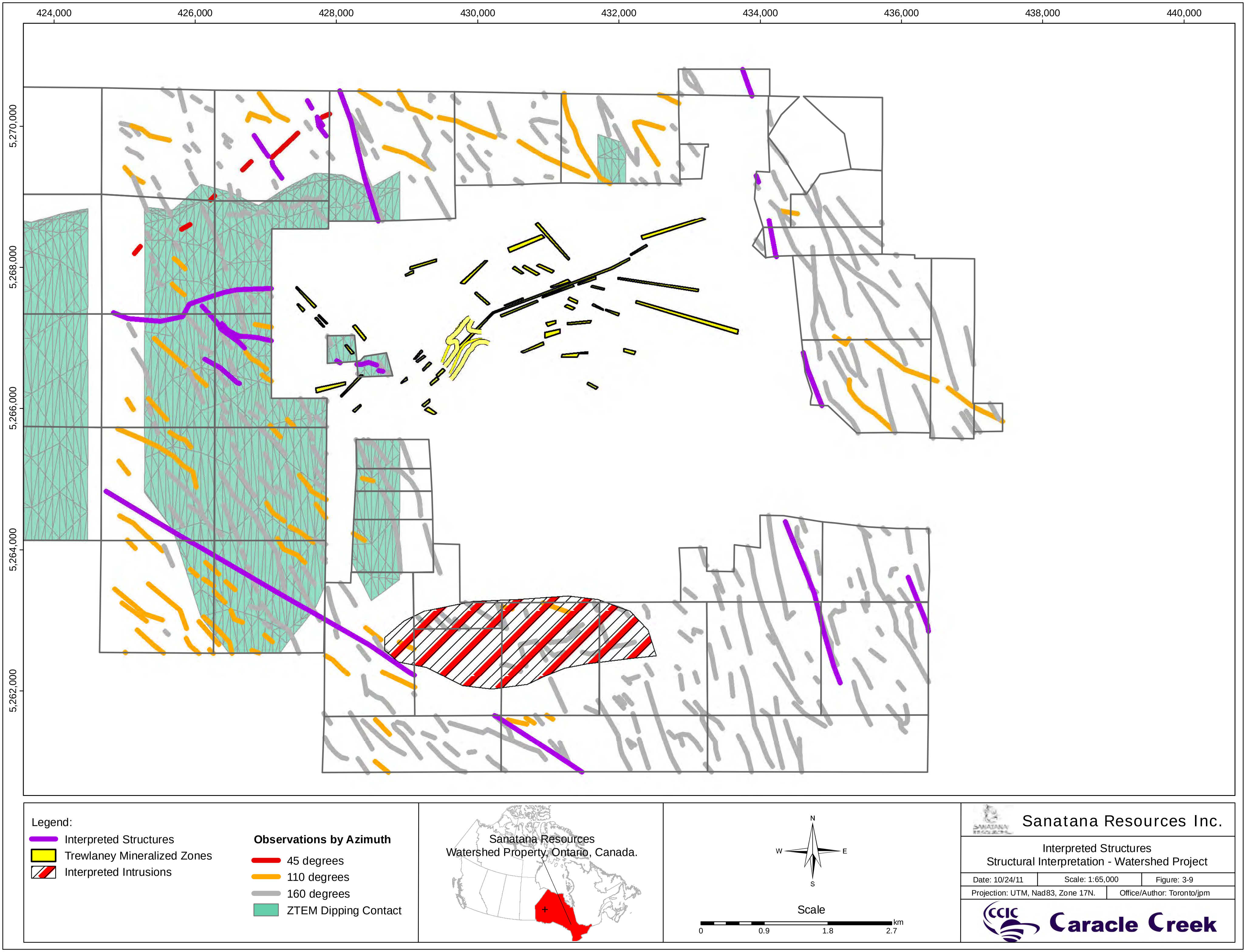
Although a 3D inversion would include crossline components, it is suspected that a 3D inversion would not resolve if this feature exists and therefore is not recommended.


424,000
426,000
428,000
430,000
432,000
434,000
436,000
438,000
440,000
5,270,000
5,268,000
5,266,000
5,264,000
5,262,000
Legend:
Interpreted_Structures_Clipped
Trewlaney Mineralized Zones
Interpreted Intrusions
ZTEM Dipping Contact
Sanatana Resources
Watershed Property, Ontario, Canada.
N
W
E
S
Scale
0
0.9
1.8
2.7
km
Sanatana Resources Inc.
Interpreted Structures
Structural Interpretation - Watershed Project
Date: 10/24/11
Scale: 1:65,000
Figure: 3-8
Projection: UTM, Nad83, Zone 17N.
Office/Author: Toronto/jpm
Caracle Creek

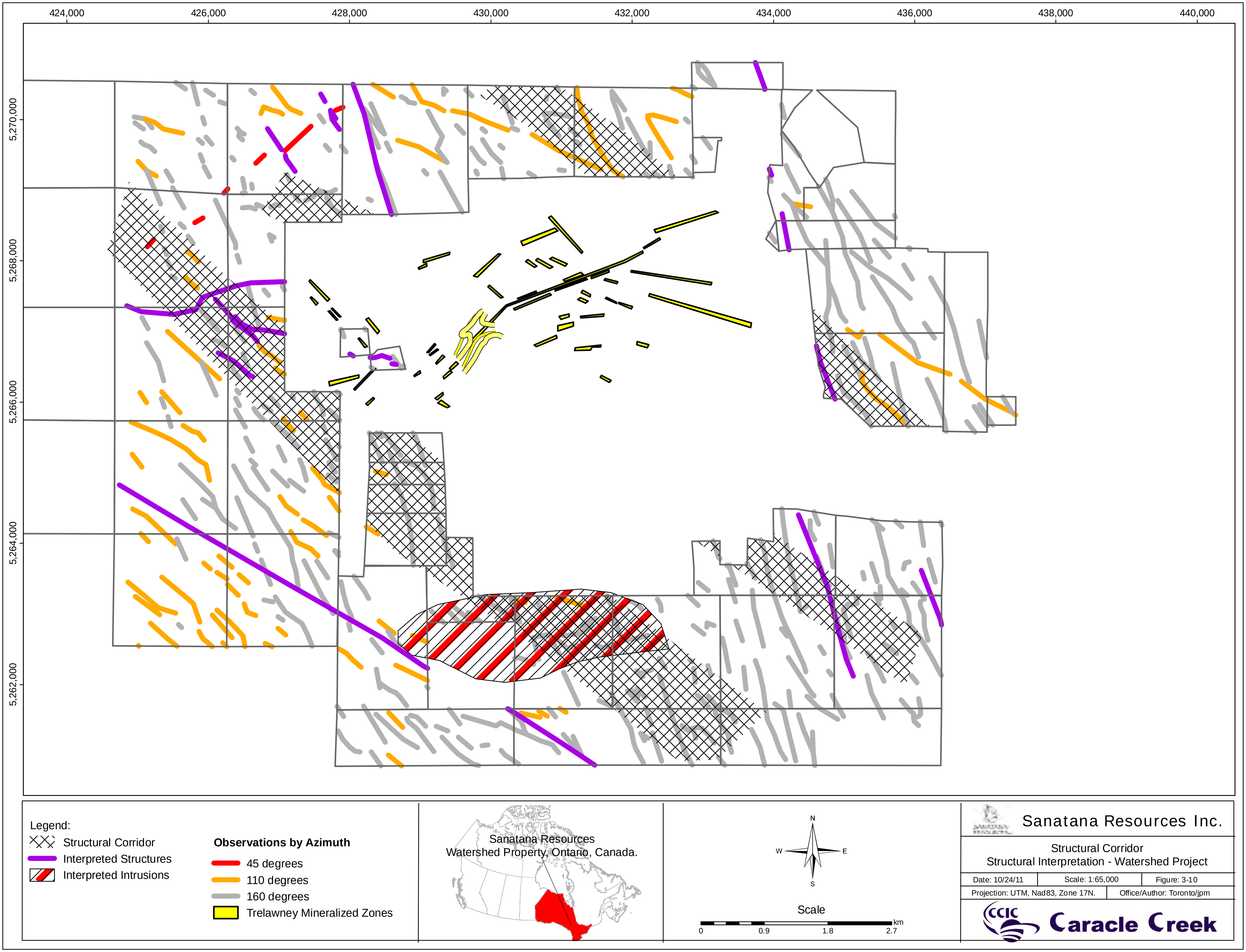
3.2 Analysis

Several major structures are highlighted in Figure 3-9 (purple) from the initial 1VD and TMI observations. It can be seen that these major structures bookend the Trelawney mineralized zones and are offset by a major NNW fault. The 3D extent of the dipping contact found in the ZTEM data is shown in green.

The dominating 160^{o} Matachewan and Hearst features do not appear to host mineralization, but they do appear to be important in terms of entrapment. The mineralized zones on the Trelawney property are 45^{o}-80^{o} and exhibit folding by a later hinge tracking 130^{o}-135^{o} (Figure 3-10 – hatch marked). It is not known if this hinge is syn- or post- mineralization.



424,000
426,000
428,000
430,000
432,000
434,000
436,000
438,000
440,000
5,270,000
5,268,000
5,266,000
5,264,000
5,262,000
Legend:
Interpreted Structures
Trewlaney Mineralized Zones
Interpreted Intrusions
Observations by Azimuth
45 degrees
110 degrees
160 degrees
ZTEM Dipping Contact
Sanatana Resources
Watershed Property, Ontario, Canada.
N
W
E
S
Scale
0
0.9
1.8
2.7
km
Sanatana Resources Inc.
Interpreted Structures
Structural Interpretation - Watershed Project
Date: 10/24/11
Scale: 1:65,000
Figure: 3-9
Projection: UTM, Nad83, Zone 17N.
Office/Author: Toronto/jpm
Caracle Creek


424,000
426,000
428,000
430,000
432,000
434,000
436,000
438,000
440,000
5,270,000
5,268,000
5,266,000
5,264,000
5,262,000
Legend:
Structural Corridor
Interpreted Structures
Interpreted Intrusions
Observations by Azimuth
45 degrees
110 degrees
160 degrees
Trelawney Mineralized Zones
Sanatana Resources
Watershed Property, Ontario, Canada.
N
W
E
S
Scale
0
0.9
1.8
2.7
km
Sanatana Resources Inc.
Structural Corridor
Structural Interpretation - Watershed Project
Date: 10/24/11
Scale: 1:65,000
Figure: 3-10
Projection: UTM, Nad83, Zone 17N.
Office/Author: Toronto/jpm
Caracle Creek

The ZTEM resistivity model shows correlation with the interpreted fault (Figure 3-11), demonstrating a break in resistive features in the north and a contact between resistive and conductive features to the south. The large intrusion in the south also has resistive coincidence.

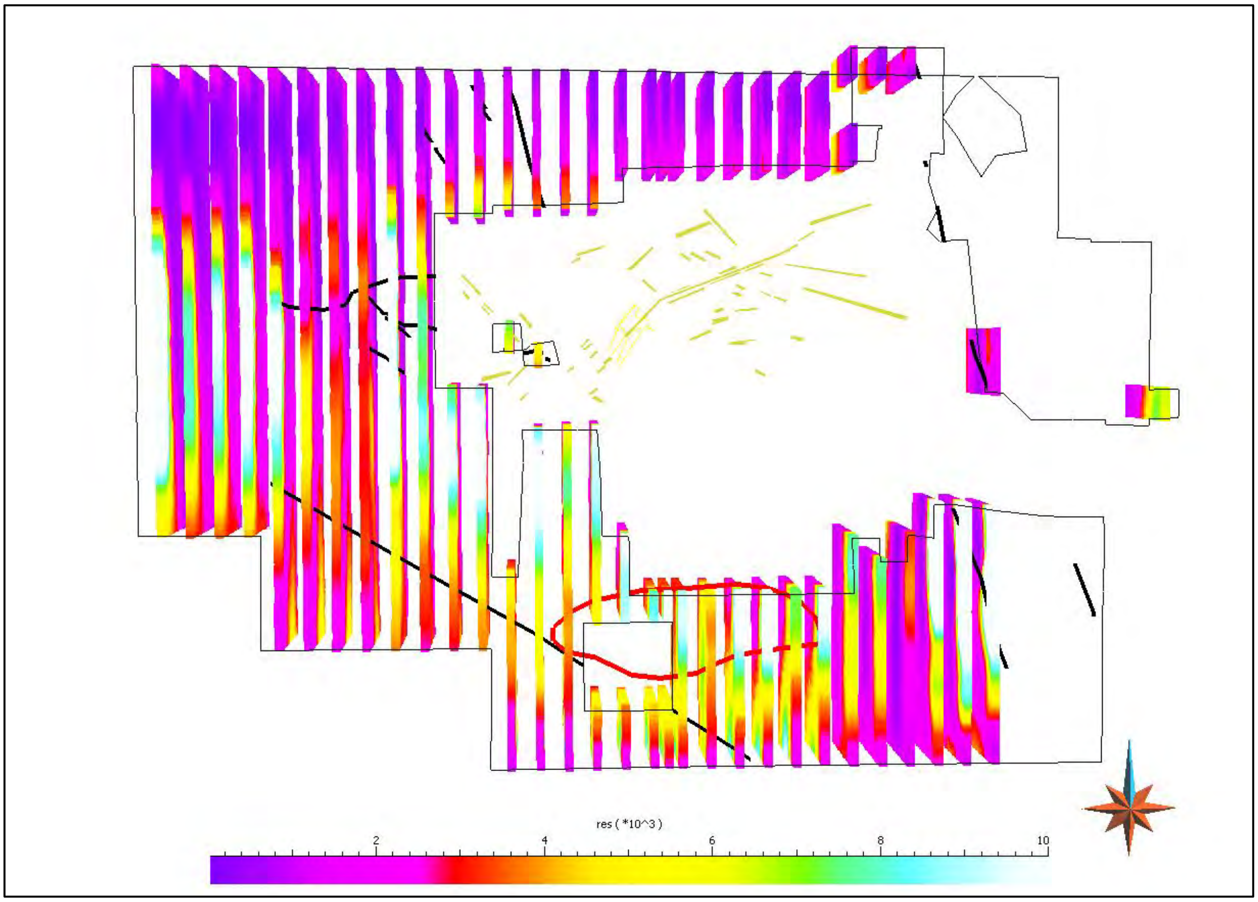


Figure 3-11. ZTEM resistivity with major structure (black) and interpreted intrusions (red). Mineralized zones in yellow.

The majority of mineralized zones adjacent to the Watershed Property appear to largely be coincident with the more conductive bedrock units (purple on this colour scale) although some are mapped across the northern resistive unit.

3.1 Interpretation and Targeting

Extrapolating to the larger context, several potential fold hinges are noted throughout the survey area. A series of structural corridors are noted east and west of the Chester Deposit tracking 120^{o} – 135^{o} and are displayed in Figure 3-10 (hatch marked).

Gold mineralization generally requires a brittle-ductile deformational environment for emplacement, hence its tendency to occur within more competent rock units adjacent to shear zones. Gold is an incompatible element and driven off in metamorphic fluids. This fluid does not flow in this ductile environment and requires the breaks and fractures caused brittle environment to transport and emplace the gold. Fault zones are areas of low pressure and are critical to these formational conditions. Both folding and faulting are noted in this dataset, and these areas are highlighted as targets.

Five main areas are highlighted as potential target areas from this data review, and are highlighted in Figure 3-12. All targets are assigned the prefix 'WAT' for Watershed property. Figure 3-13 shows these targets in a 3D context.

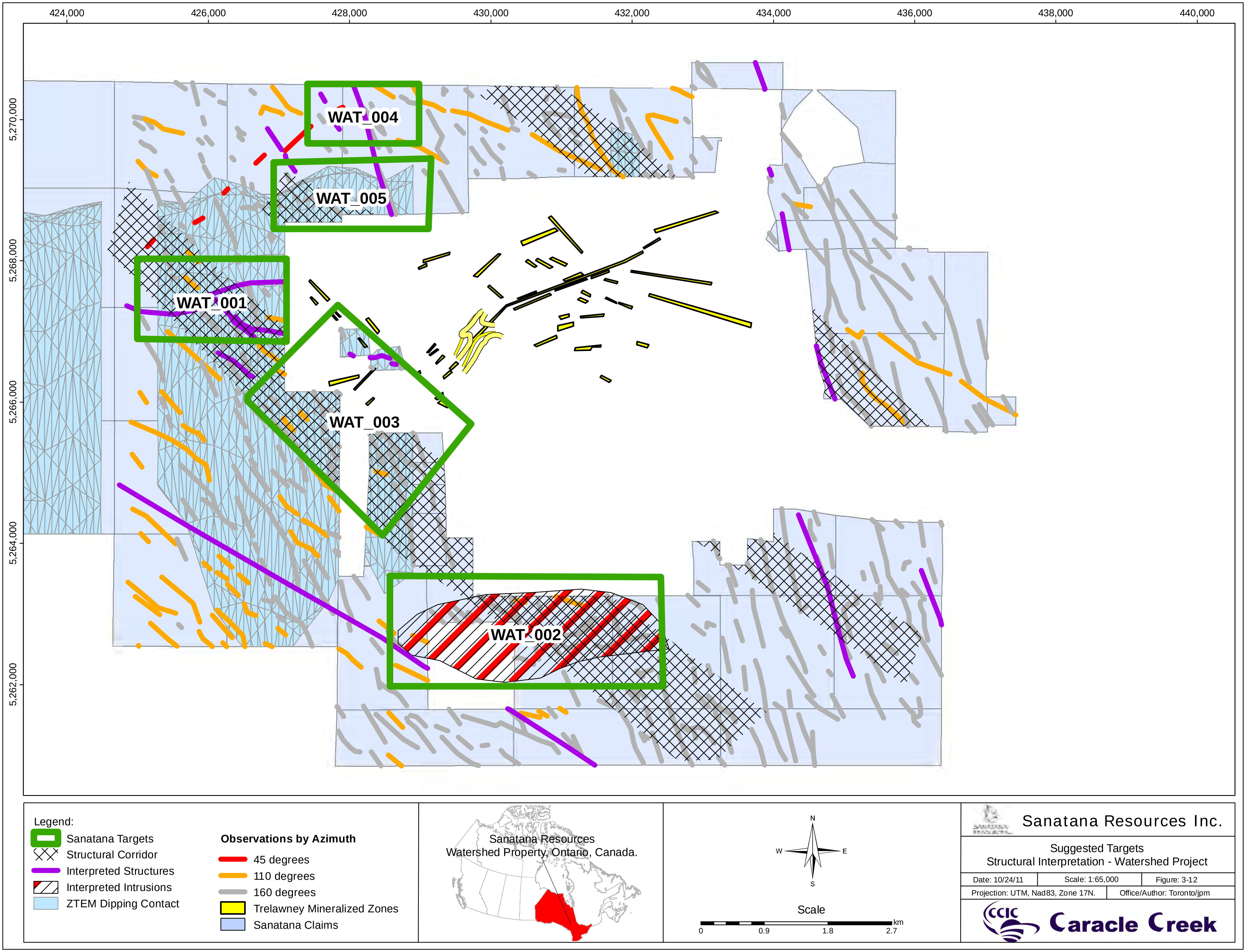
WAT_001 – This target represents the intersection of two significant structures with respect to the adjacent mineralized deposits. Both structures offset the Matachewan and Hearst dykes (160^{o}) in the magnetics. In addition, this structure lies within a high interest fold corridor. This area is predominantly conductive in the ZTEM data. It is recommended to complete further work in this area.

WAT_002 – This target is centred on the potential intrusive feature. It is a prominent secondary feature that requires ground truthing and age dating. This target is has resistive coincidence in the ZTEM data.

WAT_003 – This area has been surveyed with EarthProbe. It exists in a favorable structural corridor and is the extension of the current known mineralized zones. This area is has predominantly resistive coincidence in the ZTEM data.

WAT_004 – This area is the intersection of the three main trending swarms with the major NNW trending fault. The area has conductive coincidence in the ZTEM data.

WAT_005 – Low angle conductive/resistive contact identified in ZTEM data. This target zone coincides with the intersection of major structure identified in the magnetics. Recommended for follow-up.



424,000
426,000
428,000
430,000
432,000
434,000
436,000
438,000
440,000
5,270,000
5,268,000
5,266,000
5,264,000
5,262,000
WAT_001
WAT_002
WAT_003
WAT_004
WAT_005
Legend:
Sanatana Targets
Structural Corridor
Interpreted Structures
Interpreted Intrusions
ZTEM Dipping Contact
Observations by Azimuth
45 degrees
110 degrees
160 degrees
Trelawney Mineralized Zones
Sanatana Claims
Sanatana Resources
Watershed Property, Ontario, Canada.
N
E
S
W
Scale
0
0.9
1.8
2.7
km
Sanatana Resources Inc.
Suggested Targets
Structural Interpretation - Watershed Project
Date: 10/24/11
Scale: 1:65,000
Figure: 3-12
Projection: UTM, Nad83, Zone 17N.
Office/Author: Toronto/jpm
Caracle Creek

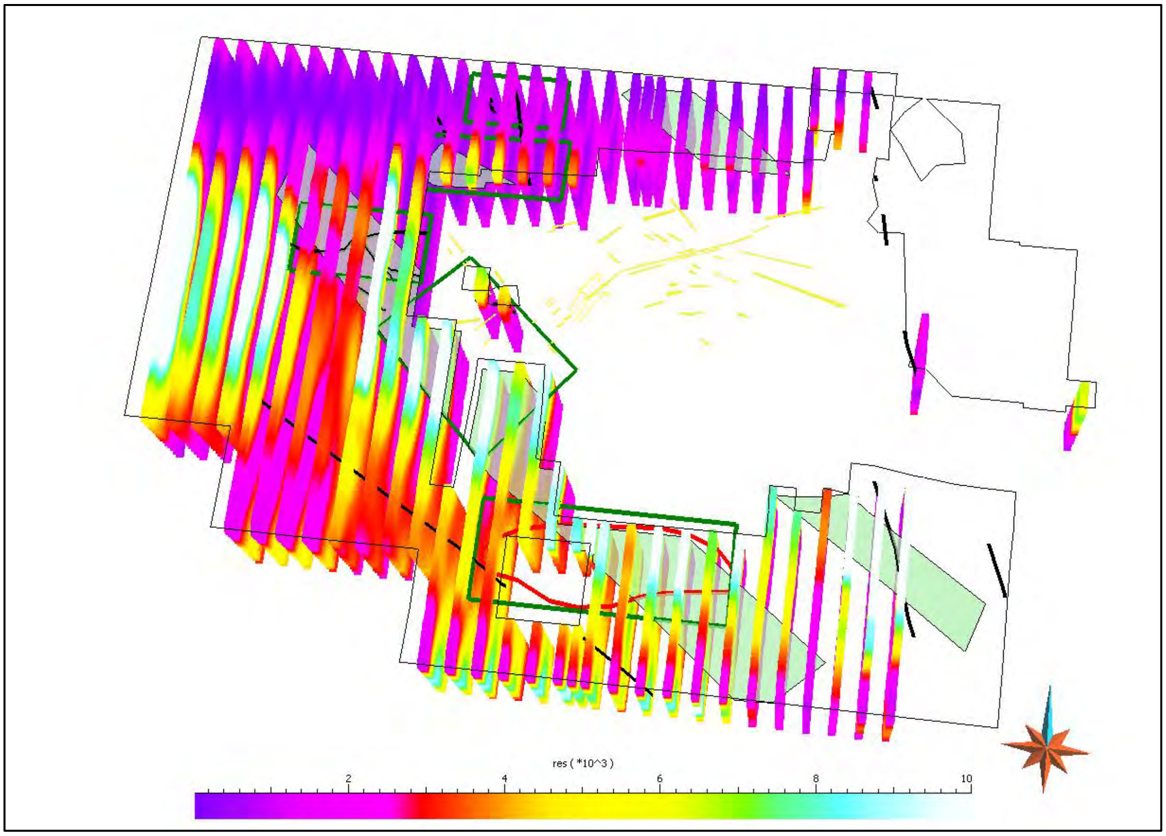


Figure 3-13. Suggested targets with structure, intrusions, and ZTEM resistivity model in 3D.

4.0 Conclusions and Recommendations

It is recommended to ground truth all prominent structures in the field. Given that fold sets are omnipresent, if outcrops are located then good folding measurements along with indications of alteration and fracturing can be determined. The intersection of shear zones with fold axes, flexures or competent rocks are extremely important in identifying gold traps. In addition, it is important to determine the relative age of mineralization with the various structures and rocks encountered.

The southern possible intrusion is a prominent feature and requires ground truthing for confirmation and age dating to determine if it is post-mineralization. The resistive coincidence in the ZTEM data is upgrading that this is a separate rock type.

The possible low-angle resistive/conductive contact should be ground truthed and possibly drill tested for confirmation. If this area represents a thrust fault it may be upgrading in terms of hosting mineralization.

5.0 REFERENCES

Geotech (2011). Report on a Helicopter-Borne Z-Axis Tipper Electromagnetic (ZTEM) and Aeromagnetic Geophysical Survey, Watershed Block, Gogama, ON for Sanatana Resources.

MNDMF Chester Gold Occurrence (2005). General information on the Chester Gold Occurrence. MDI Number: MDI41P12SW00020.

MNDMF Earth Resources and Land Information System Data Sets (2000). Bedrock Geology of Ontario, Seamless Coverage, 1993, Re-released March 2000.

Ronacher, E. Magyarosi, Z., Tucker, M. (2011). Independent Technical Report: Watershed Gold Property, Ontario, Canada. Prepared for Sanatana Diamonds Inc. Effective Date: February 14, 2011, Submission Date: March 14, 2011.

Siddorn, J.P. (2010). The Geological Interpretation of Aeromagnetic Data: A Geologist's Perspective. Presentation – KEGS Symposium, March 6th 2010.

6.0 STATEMENT OF AUTHORSHIP

This Report, titled "Structural Interpretation Report, Watershed Gold Property, Ontario, Canada", with original date of November 11th, 2011 and amended date of June 19th, 2012 was prepared and signed by the following authors:

"Jenna McKenzie"

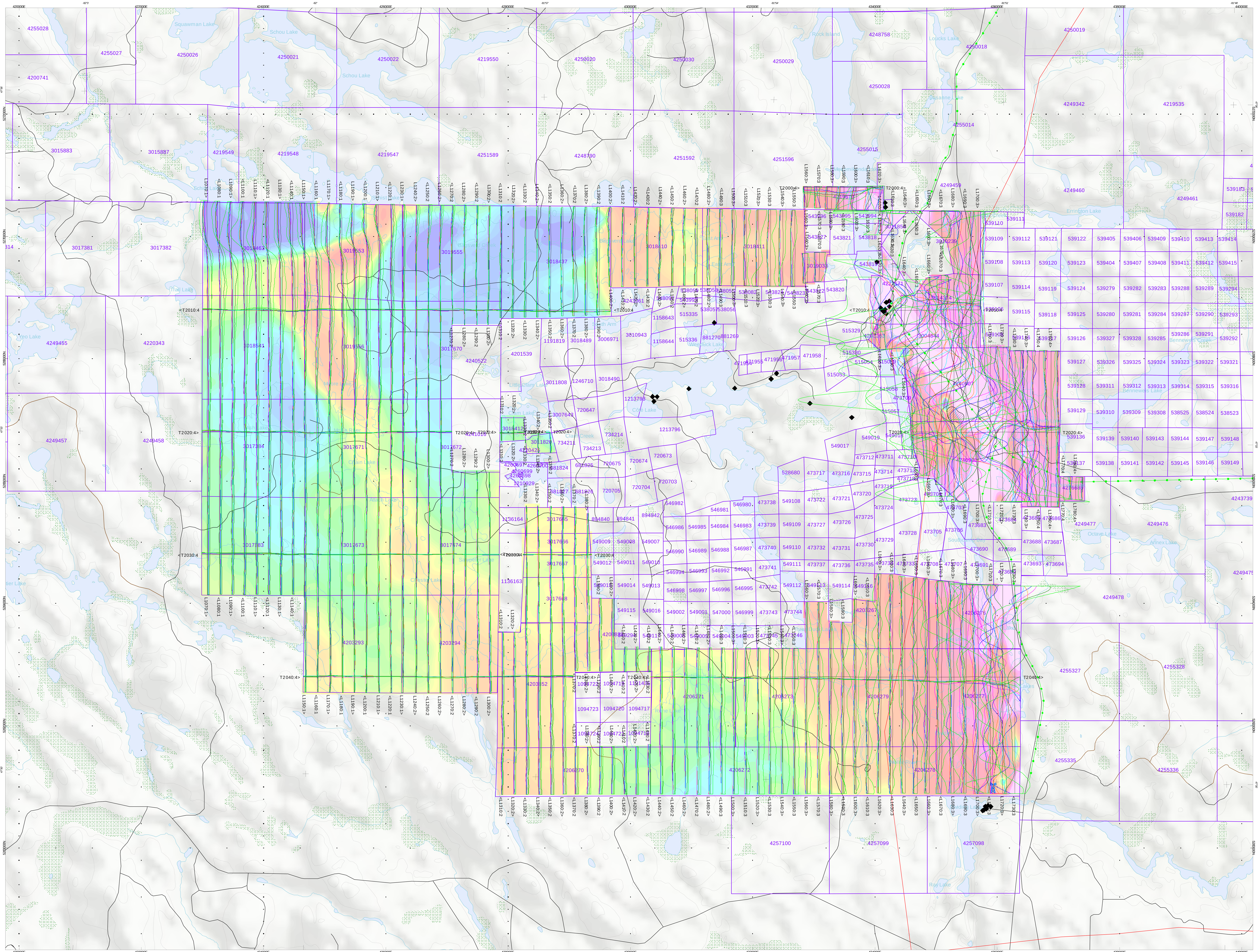
____
Geophysicist, Hon.B.Sc., P.Geo.
June 19th, 2012
Toronto, Ontario

"Stephen Wetherup"

____
Principal Geologist, B.Sc., P.Geo.
June 19th, 2012
Vancouver, British Columbia

Appendix 5

Technical Data



GEOTECH LTD.

SURVEY SPECIFICATIONS:

Survey Flying Date: April 4th to 19th, 2011
Survey Operations Base: Gogama, Ontario
Nominal Survey Line Spacing: 200 Meters
Nominal Survey Line Direction: N 0° E / N 180° E
Nominal Survey Tie Line Spacing: 2000 Meters
Nominal Survey Tie Line Direction: N 90° E / N 270° E
Helicopter Mean Terrain Clearance: 151 metres
Mean Ground Air Speed: 25 metres/sec
ZTEM airborne coil: towed at a mean distance of 74 m below the helicopter
Airborne Magnetometer bird: towed at a mean distance of 57 m below the helicopter

HELICOPTER SPECIFICATIONS

Helicopter Type: Aerospatiale A-Star 350 B3 (C-GEOZ)

AIRBORNE INSTRUMENTATION

Survey Type: Helicopter Z-Axis Tipper Electromagnetic (ZTEM), Magnetic towed Bird
GPS Receivers (4): NovAtel CDGPS enabled Propak V3-RT20
GPS Receivers Location: One on the helicopter, three on EM coil
Radar Altimeter: Terra TRA 3000/TRI 40
Navigation: GEONAV-3

AIRBORNE ELECTROMAGNETIC SYSTEM
Electromagnetic System: Geotech Z-Axis Tipper (ZTEM)
Coil dimensions: 7.4 metres diameter
Coil orientation: Vertical Dipole
Digitizing rate: 2000Hz

AIRBORNE MAGNETOMETER
Magnetometer: GEOMETRICS
Magnetometer Sensitivity: +/- 0.02 nT
Sampling Rate: 0.2 Hz

GROUND INSTRUMENTATION

MAGNETIC BASE STATION
Magnetometer: GEOMETRICS
Base Station Location: Behind Gogama Lodge (47°40'34.67 N, 81°40'50.57 W)

EM BASE STATION
Two orthogonal square coils
Coil dimensions: 3.5 metres each side
Coil orientation: Horizontal Dipole
Base Station Location: off unused dirt road (47°34'19.6 N, 82°10'47.0 W)
Azimuth : AzA = N 90° E AzB = N 180° E

PROCESSING SUMMARY

MAGNETICS:
Diurnal Subtraction, microlevelling

ZTEM:
Frequencies extracted: 30, 45, 90, 180, 360, 720Hz.
Sampling rate: 0.4 sec.
Rotation of the inphase part of the inline and orthogonal components (Z/Xloc and Z/Yloc)on to UTM Eastings and Northings.
Attitude correction applied, (calculated from 3 GPS recievers installed on aiborne coil).
DIV(Tilt) calculated: dXcomp/dX+dYcomp/dY for all 6 frequencies.
Phase Rotated Grids (90 deg) calculated from each individual X and Y component grids, for each individual frequency.

MAP PROJECTION

Datum: WGS 84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.0
Eccentricity: 0.0818191908 4
NTS: 041O09, 041P12, 041O08, 041P05

Y
X
Z up

In-Phase Frequencies
0.1 units per mm
Profile Base 0

30 Hz
45 Hz
90 Hz
180 Hz
360 Hz
720 Hz

TOPOGRAPHIC LEGEND:

Towers
Buildings
Highways
Roads
Trails
Transmission Lines
Contours
Rivers / Streams
Lakes / Ponds
Wetlands
Mining Areas
Claims

1.1805
0.6017
0.4511
0.3790
0.3231
0.2544
0.1618
0.0698
0.0210
-0.0066
-0.0256
-0.0420
-0.0568
-0.0699
-0.0799
-0.0870
-0.0930
-0.0992
-0.1043
-0.1088
-0.1130
-0.1168
-0.1205
-0.1245
-0.1287
-0.1325
-0.1358
-0.1395
-0.1434
-0.1476
-0.1525
-0.1584
-0.1644
-0.1713
-0.1797
-0.1899
-0.2008
-0.2255

90Hz Tzy IP

Scale 1:20000
250 0 250 500 750 1000
(meters)
WGS 84 / UTM zone 17N

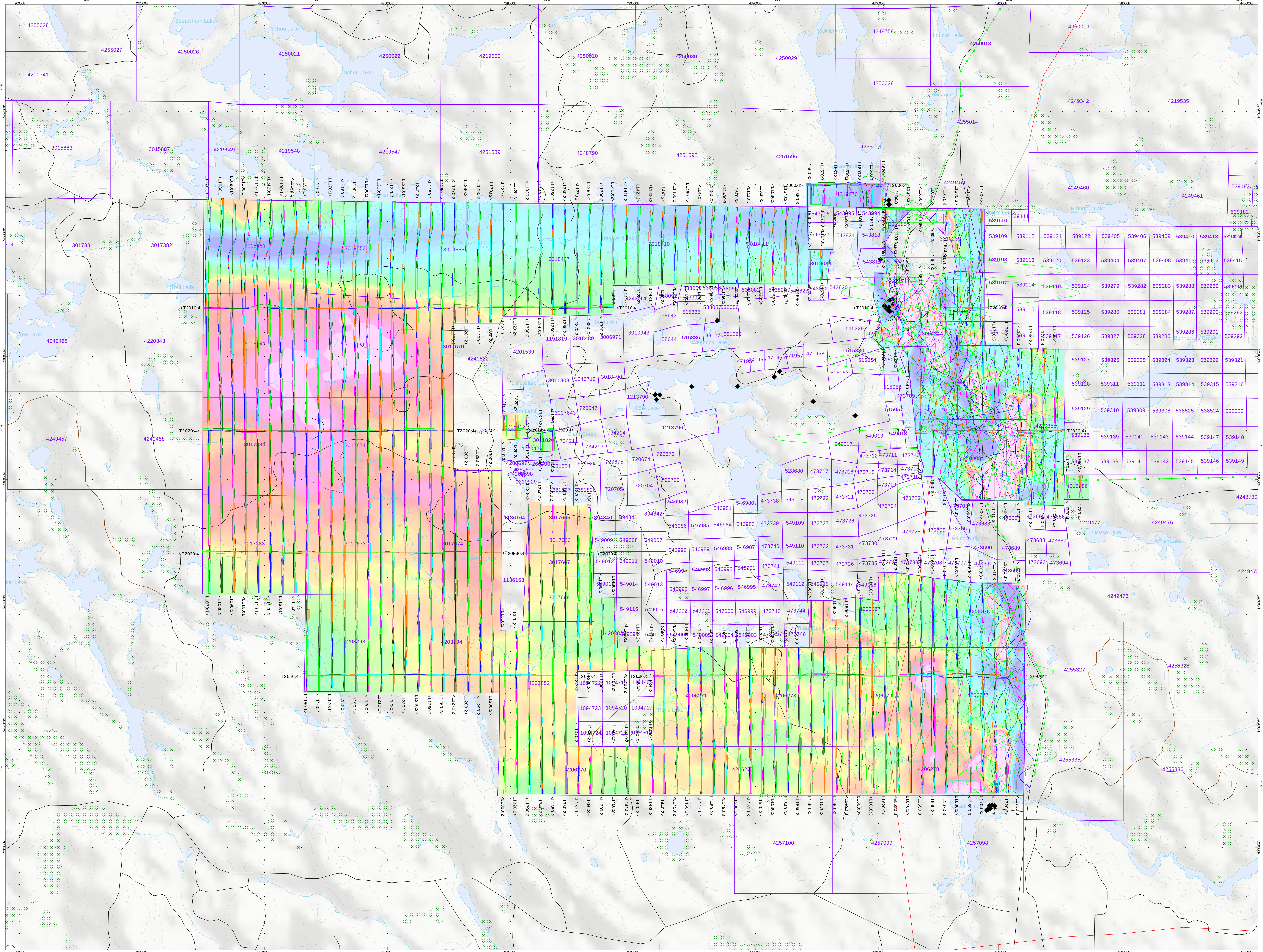
The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM (Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

Sanatana Resources Inc.
Watershed Block
Gogama, Ontario

Geotech ZTEM System
Tzy (Cross-line) In-Phase Profiles over 90Hz Phase Rotated In-Phase Grid

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

May 2011



SURVEY SPECIFICATIONS:

Survey Flying Date: April 4th to 19th, 2011
Survey Operations Base: Gogama, Ontario
Nominal Survey Line Spacing: 200 Meters
Nominal Survey Line Direction: N 0° E / N 180° E
Nominal Survey Tie Line Spacing: 2000 Meters
Nominal Survey Tie Line Direction: N 90° E / N 270° E
Helicopter Mean Terrain Clearance: 151 metres
Mean Ground Air Speed: 25 metres/sec
ZTEM airborne coil: towed at a mean distance of 74 m below the helicopter
Airborne Magnetometer bird: towed at a mean distance of 57 m below the helicopter

HELICOPTER SPECIFICATIONS

Helicopter Type: Aerospatiale A-Star 350 B3 (C-GEOZ)

AIRBORNE INSTRUMENTATION

Survey Type: Helicopter Z-Axis Tipper Electromagnetic (ZTEM), Magnetic towed Bird
GPS Receivers (4): NovAtel CDGPS enabled Propak V3-RT20
GPS Receivers Location: One on the helicopter, three on EM coil
Radar Altimeter: Terra TRA 3000/TRI 40
Navigation: GEONAV-3

AIRBORNE ELECTROMAGNETIC SYSTEM

Electromagnetic System: Geotech Z-Axis Tipper (ZTEM)
Coil dimensions: 7.4 metres diameter
Coil orientation: Vertical Dipole
Digitizing rate: 2000Hz

AIRBORNE MAGNETOMETER

Magnetometer: GEOMETRICS
Magnetometer Sensitivity: +/- 0.02 nT
Sampling Rate: 0.2 Hz

GROUND INSTRUMENTATION

MAGNETIC BASE STATION

Magnetometer: GEOMETRICS
Base Station Location: Behind Gogama Lodge (47°40'34.67 N, 81°40'50.57 W)

EM BASE STATION

Two orthogonal square coils
Coil dimensions: 3.5 metres each side
Coil orientation: Horizontal Dipole
Base Station Location: off unused dirt road (47°34'19.6 N, 82°10'47.0 W)
Azimuth : AzA = N 90° E AzB = N 180° E

PROCESSING SUMMARY

MAGNETICS:

Diurnal Subtraction, microlevelling

ZTEM:

Frequencies extracted: 30, 45, 90, 180, 360, 720Hz.
Sampling rate: 0.4 sec.
Rotation of the inphase part of the inline and orthogonal components (Z/Xloc and Z/Yloc)on to UTM Eastings and Northings.
Attitude correction applied, (calculated from 3 GPS recievers installed on aiborne coil).
DIV(Tilt) calculated: dXcomp/dX+dYcomp/dY for all 6 frequencies.
Phase Rotated Grids (90 deg) calculated from each individual X and Y component grids, for each individual frequency.

MAP PROJECTION

Datum: WGS 84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.0
Eccentricity: 0.0818191908 4
NTS: 041O09, 041P12, 041O08, 041P05

Y
-
+
X
Z up

Quadrature Frequencies
0.075 units per mm
Profile Base 0

magenta	30 Hz
blue	45 Hz
orange	90 Hz
cyan	180 Hz
dark green	360 Hz
light green	720 Hz

TOPOGRAPHIC LEGEND:

- Towers
- Buildings
- Highways
- Roads
- Trails
- Transmission Lines
- Contours
- Rivers / Streams
- Lakes / Ponds
- Wetlands
- Mining Areas
- Claims

0.1353
0.1181
0.1125
0.1085
0.1052
0.1025
0.1007
0.0987
0.0965
0.0934
0.0896
0.0865
0.0842
0.0823
0.0805
0.0788
0.0773
0.0758
0.0743
0.0724
0.0707
0.0685
0.0663
0.0638
0.0607
0.0565
0.0511
0.0435
0.0342
0.0208
0.0082
-0.0048
-0.0156
-0.0294
-0.0471
-0.0701
-0.0964
-0.1479

90Hz Tzx QD

Scale 1:20000

250 0 250 500 750 1000

(meters)

WGS 84 / UTM zone 17N

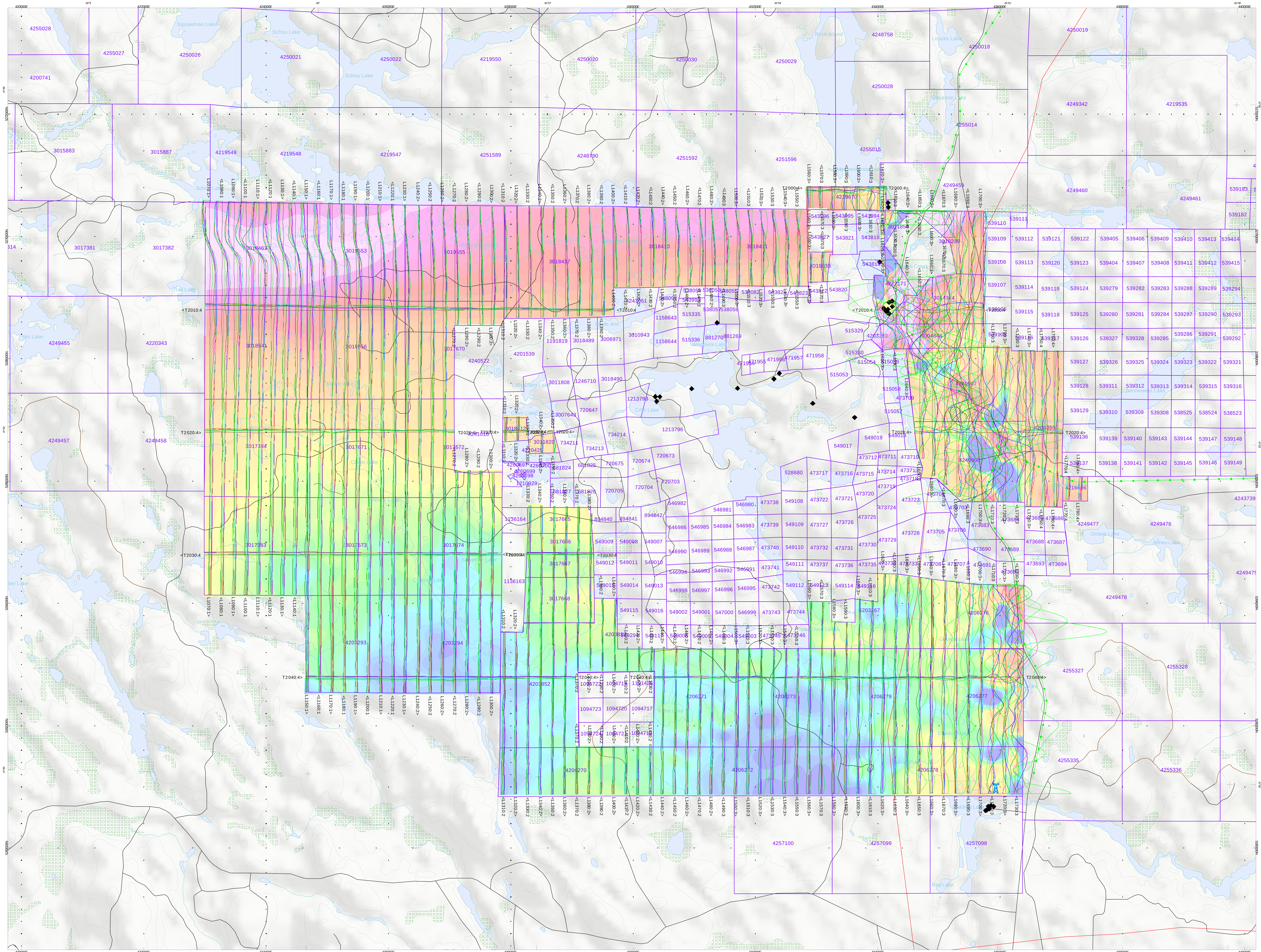
The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM(Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

Sanatana Resources Inc.
Watershed Block
Gogama, Ontario

Geotech ZTEM System
Tzx (In-line) Quadrature Profiles over 90Hz Phase Rotated Quadrature Grid

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

May 2011



GEOTECH LTD.

SURVEY SPECIFICATIONS:

Survey Flying Date: April 4th to 19th, 2011
Survey Operations Base: Gogama, Ontario
Nominal Survey Line Spacing: 200 Meters
Nominal Survey Line Direction: N 0° E / N 180° E
Nominal Survey Tie Line Spacing: 2000 Meters
Nominal Survey Tie Line Direction: N 90° E / N 270° E
Helicopter Mean Terrain Clearance: 151 metres
Mean Ground Air Speed: 25 metres/sec
ZTEM airborne coil: towed at a mean distance of 74 m below the helicopter
Airborne Magnetometer bird: towed at a mean distance of 57 m below the helicopter

HELICOPTER SPECIFICATIONS

Helicopter Type: Aerospatiale A-Star 350 B3 (C-GEOZ)

AIRBORNE INSTRUMENTATION

Survey Type: Helicopter Z-Axis Tipper Electromagnetic (ZTEM), Magnetic towed Bird
GPS Receivers (4): NovAtel CDGPS enabled Propak V3-RT20
GPS Receivers Location: One on the helicopter, three on EM coil
Radar Altimeter: Terra TRA 3000/TRI 40
Navigation: GEONAV-3

AIRBORNE ELECTROMAGNETIC SYSTEM

Electromagnetic System: Geotech Z-Axis Tipper (ZTEM)
Coil dimensions: 7.4 metres diameter
Coil orientation: Vertical Dipole
Digitizing rate: 2000Hz

AIRBORNE MAGNETOMETER

Magnetometer: GEOMETRICS
Magnetometer Sensitivity: +/- 0.02 nT
Sampling Rate: 0.2 Hz

GROUND INSTRUMENTATION

MAGNETIC BASE STATION

Magnetometer: GEOMETRICS
Base Station Location: Behind Gogama Lodge (47°40'34.67 N, 81°40'50.57 W)

EM BASE STATION

Two orthogonal square coils
Coil dimensions: 3.5 metres each side
Coil orientation: Horizontal Dipole
Base Station Location: off unused dirt road (47°34'19.6 N, 82°10'47.0 W)
Azimuth : AzA = N 90° E AzB = N 180° E

PROCESSING SUMMARY

MAGNETICS:

Diurnal Subtraction, microlevelling

ZTEM:

Frequencies extracted: 30, 45, 90, 180, 360, 720Hz.
Sampling rate: 0.4 sec.
Rotation of the inphase part of the inline and orthogonal components (Z/Xloc and Z/Yloc)on to UTM Eastings and Northings.
Attitude correction applied, (calculated from 3 GPS recievers installed on aiborne coil).
DIV(Tilt) calculated: dXcomp/dX+dYcomp/dY for all 6 frequencies.
Phase Rotated Grids (90 deg) calculated from each individual X and Y component grids, for each individual frequency.

MAP PROJECTION

Datum: WGS 84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.0
Eccentricity: 0.0818191908 4
NTS: 041O09, 041P12, 041O08, 041P05

Y
X
Z up

In-Phase Frequencies
.075 units per mm
Profile Base 0

30 Hz
45 Hz
90 Hz
180 Hz
360 Hz
720 Hz

TOPOGRAPHIC LEGEND:

Towers
Buildings
Highways
Roads
Trails
Transmission Lines
Contours
Rivers / Streams
Lakes / Ponds
Wetlands
Mining Areas
Claims

0.5643
0.3887
0.3097
0.2699
0.2327
0.2068
0.1679
0.1350
0.1067
0.0826
0.0559
0.0274
0.0017
-0.0234
-0.0415
-0.0565
-0.0739
-0.0933
-0.1057
-0.1158
-0.1242
-0.1306
-0.1359
-0.1415
-0.1457
-0.1498
-0.1536
-0.1572
-0.1609
-0.1643
-0.1675
-0.1707
-0.1743
-0.1788
-0.1831
-0.1891
-0.1952
-0.2048

90Hz Tzx IP

Scale 1:20000
250 0 250 500 750 1000
(meters)
WGS 84 / UTM zone 17N

The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM (Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

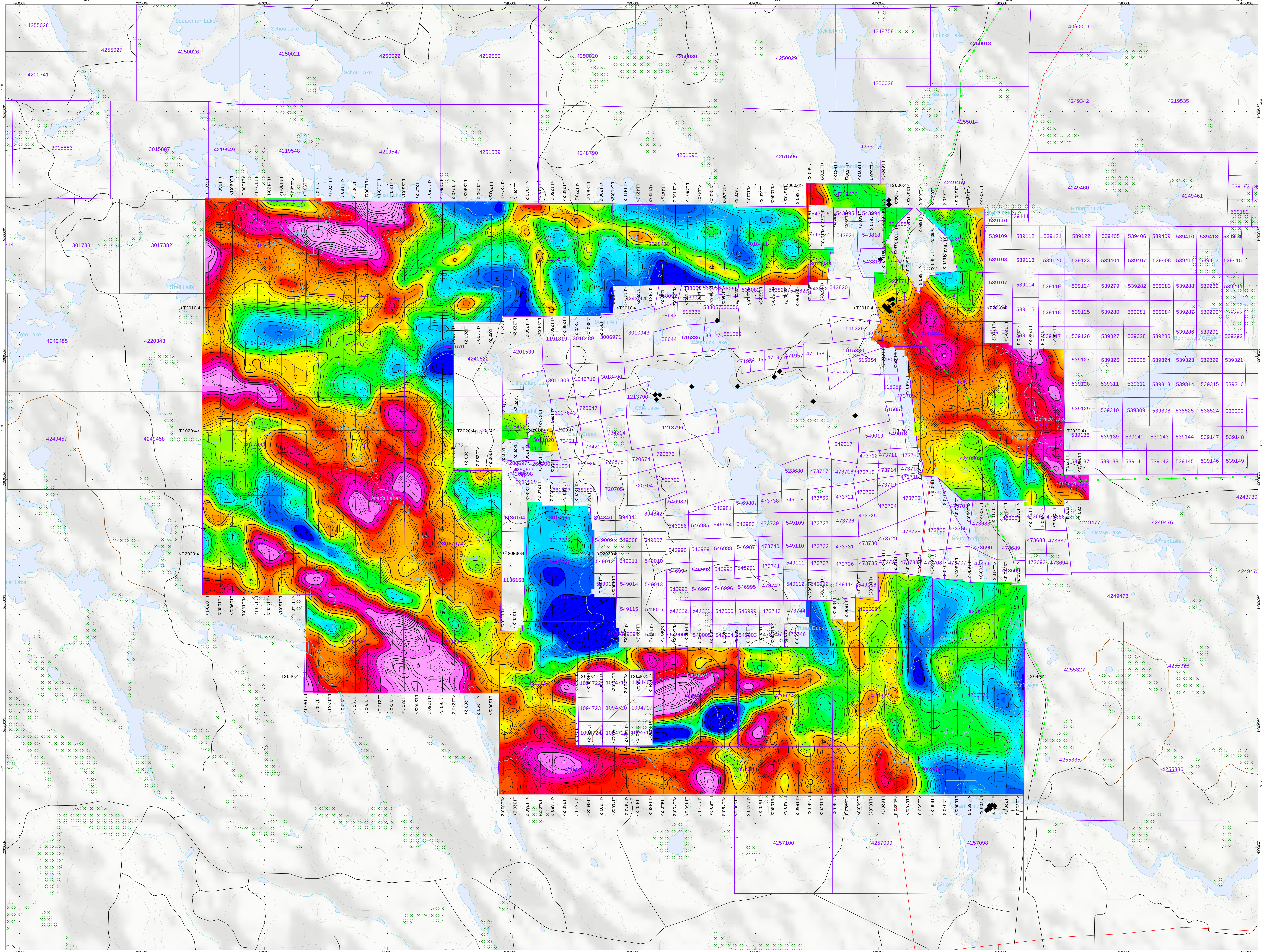
Sanatana Resources Inc.
Watershed Block
Gogama, Ontario

Geotech ZTEM System
Tzx (In-line) In-Phase Profiles over 90Hz Phase Rotated In-Phase Grid

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

May 2011

GEOTECH LTD.



SURVEY SPECIFICATIONS:

Survey Flying Date: April 4th to 19th, 2011
Survey Operations Base: Gogama, Ontario
Nominal Survey Line Spacing: 200 Meters
Nominal Survey Line Direction: N 0° E / N 180° E
Nominal Survey Tie Line Spacing: 2000 Meters
Nominal Survey Tie Line Direction: N 90° E / N 270° E
Helicopter Mean Terrain Clearance: 151 metres
Mean Ground Air Speed: 25 metres/sec
ZTEM airborne coil: towed at a mean distance of 74 m below the helicopter
Airborne Magnetometer bird: towed at a mean distance of 57 m below the helicopter

HELICOPTER SPECIFICATIONS

Helicopter Type: Aerospatiale A-Star 350 B3 (C-GEOZ)

AIRBORNE INSTRUMENTATION

Survey Type: Helicopter Z-Axis Tipper Electromagnetic (ZTEM), Magnetic towed Bird
GPS Receivers (4): NovAtel CDGPS enabled Propak V3-RT20
GPS Receivers Location: One on the helicopter, three on EM coil
Radar Altimeter: Terra TRA 3000/TRI 40
Navigation: GEONAV-3

AIRBORNE ELECTROMAGNETIC SYSTEM

Electromagnetic System: Geotech Z-Axis Tipper (ZTEM)
Coil dimensions: 7.4 metres diameter
Coil orientation: Vertical Dipole
Digitizing rate: 2000Hz

AIRBORNE MAGNETOMETER

Magnetometer: GEOMETRICS
Magnetometer Sensitivity: +/- 0.02 nT
Sampling Rate: 0.2 Hz

GROUND INSTRUMENTATION

MAGNETIC BASE STATION

Magnetometer: GEOMETRICS
Base Station Location: Behind Gogama Lodge (47°40'34.67 N, 81°40'50.57 W)

EM BASE STATION

Two orthogonal square coils
Coil dimensions: 3.5 metres each side
Coil orientation: Horizontal Dipole
Base Station Location: off unused dirt road (47°34'19.6 N, 82°10'47.0 W)
Azimuth : AzA = N 90° E AzB = N 180° E

PROCESSING SUMMARY

MAGNETICS:

Diurnal Subtraction, microlevelling

ZTEM:

Frequencies extracted: 30, 45, 90, 180, 360, 720Hz.
Sampling rate: 0.4 sec.
Rotation of the inphase part of the inline and orthogonal components (Z/Xloc and Z/Yloc)on to UTM Eastings and Northings.
Attitude correction applied, (calculated from 3 GPS recievers installed on aiborne coil).
DIV(Tilt) calculated: dXcomp/dX+dYcomp/dY for all 6 frequencies.
Phase Rotated Grids (90 deg) calculated from each individual X and Y component grids, for each individual frequency.

MAP PROJECTION

Datum: WGS 84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.0
Eccentricity: 0.0818191908 4
NTS: 041O09, 041P12, 041O08, 041P05

TMI Contour Intervals:
10 nT
50 nT
250 nT

TOPOGRAPHIC LEGEND:

Towers
Buildings
Highways
Roads
Trails
Transmission Lines
Contours
Rivers / Streams
Lakes / Ponds
Wetlands
Mining Areas
Claims

TMI (nT)

Scale 1:20000

250 0 250 500 750 1000

(meters)

WGS 84 / UTM zone 17N

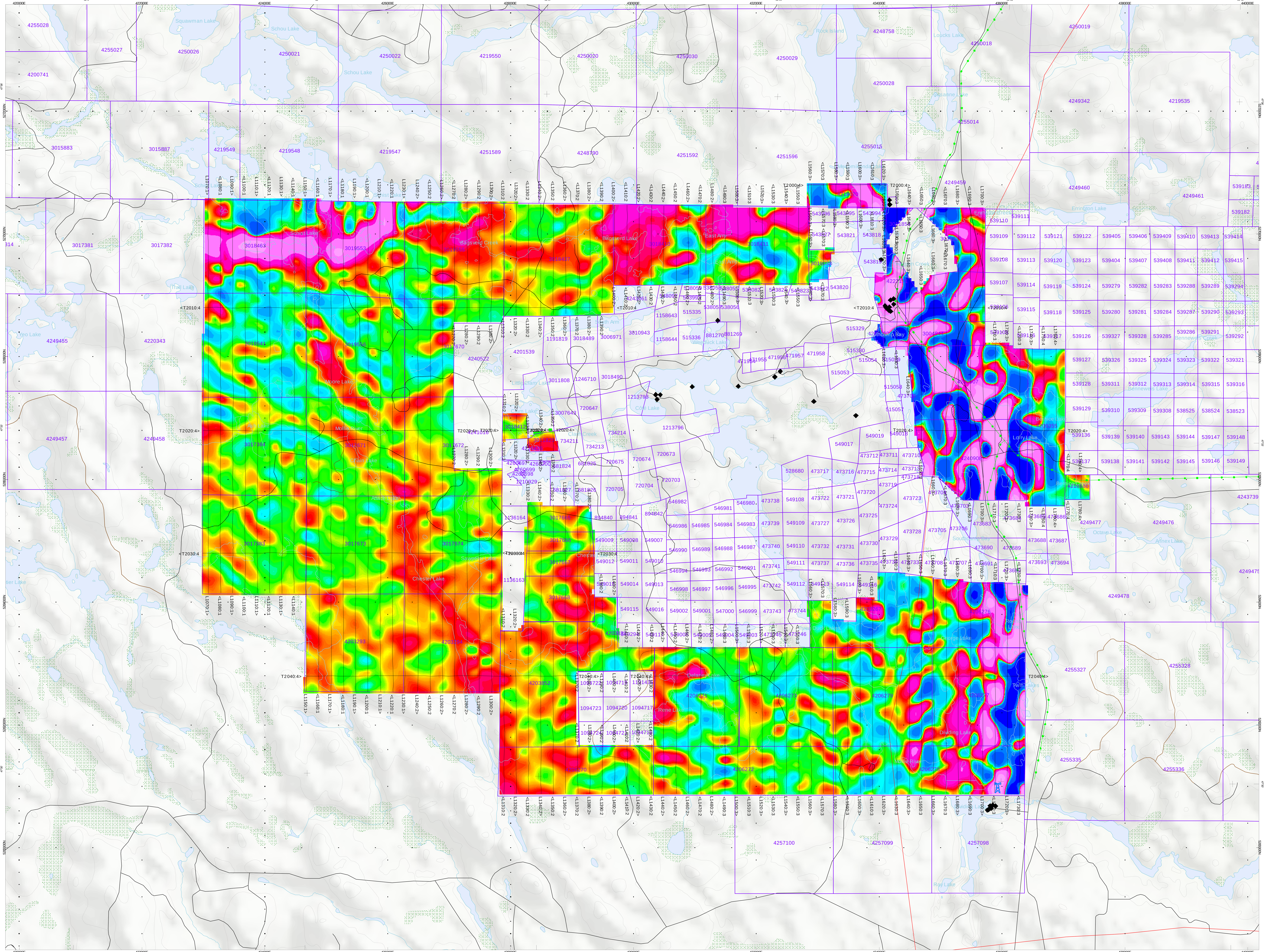
The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM (Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

Sanatana Resources Inc.
Watershed Block
Gogama, Ontario

Geotech ZTEM System
Total Magnetic Intensity (TMI)

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

May 2011



GEOTECH LTD.

SURVEY SPECIFICATIONS:

Survey Flying Date: April 4th to 19th, 2011
Survey Operations Base: Gogama, Ontario
Nominal Survey Line Spacing: 200 Meters
Nominal Survey Line Direction: N 0° E / N 180° E
Nominal Survey Tie Line Spacing: 2000 Meters
Nominal Survey Tie Line Direction: N 90° E / N 270° E
Helicopter Mean Terrain Clearance: 151 metres
Mean Ground Air Speed: 25 metres/sec
ZTEM airborne coil: towed at a mean distance of 74 m below the helicopter
Airborne Magnetometer bird: towed at a mean distance of 57 m below the helicopter

HELICOPTER SPECIFICATIONS

Helicopter Type: Aerospatiale A-Star 350 B3 (C-GEOZ)

AIRBORNE INSTRUMENTATION

Survey Type: Helicopter Z-Axis Tipper Electromagnetic (ZTEM), Magnetic towed Bird
GPS Receivers (4): NovAtel CDGPS enabled Propak V3-RT20
GPS Receivers Location: One on the helicopter, three on EM coil
Radar Altimeter: Terra TRA 3000/TRI 40
Navigation: GEONAV-3

AIRBORNE ELECTROMAGNETIC SYSTEM

Electromagnetic System: Geotech Z-Axis Tipper (ZTEM)
Coil dimensions: 7.4 metres diameter
Coil orientation: Vertical Dipole
Digitizing rate: 2000Hz

AIRBORNE MAGNETOMETER

Magnetometer: GEOMETRICS
Magnetometer Sensitivity: +/- 0.02 nT
Sampling Rate: 0.2 Hz

GROUND INSTRUMENTATION

MAGNETIC BASE STATION

Magnetometer: GEOMETRICS
Base Station Location: Behind Gogama Lodge (47°40'34.67 N, 81°40'50.57 W)

EM BASE STATION

Two orthogonal square coils
Coil dimensions: 3.5 metres each side
Coil orientation: Horizontal Dipole
Base Station Location: off unused dirt road (47°34'19.6 N, 82°10'47.0 W)
Azimuth : AzA = N 90° E AzB = N 180° E

PROCESSING SUMMARY

MAGNETICS:

Diurnal Subtraction, microlevelling

ZTEM:

Frequencies extracted: 30, 45, 90, 180, 360, 720Hz.
Sampling rate: 0.4 sec.
Rotation of the inphase part of the inline and orthogonal components (Z/Xloc and Z/Yloc)on to UTM Eastings and Northings.
Attitude correction applied, (calculated from 3 GPS recievers installed on aiborne coil).
DIV(Tilt) calculated: dXcomp/dX+dYcomp/dY for all 6 frequencies.
Phase Rotated Grids (90 deg) calculated from each individual X and Y component grids, for each individual frequency.

MAP PROJECTION

Datum: WGS 84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.0
Eccentricity: 0.08181919084
NTS: 041O09, 041P12, 041O08, 041P05

TOPOGRAPHIC LEGEND:

- Towers
- Buildings
- Highways
- Roads
- Trails
- Transmission Lines
- Contours
- Rivers / Streams
- Lakes / Ponds
- Wetlands
- Mining Areas
- Claims

IP DT
(1000*1/m)

Scale 1:20000

250 0 250 500 750 1000
(meters)
WGS 84 / UTM zone 17N

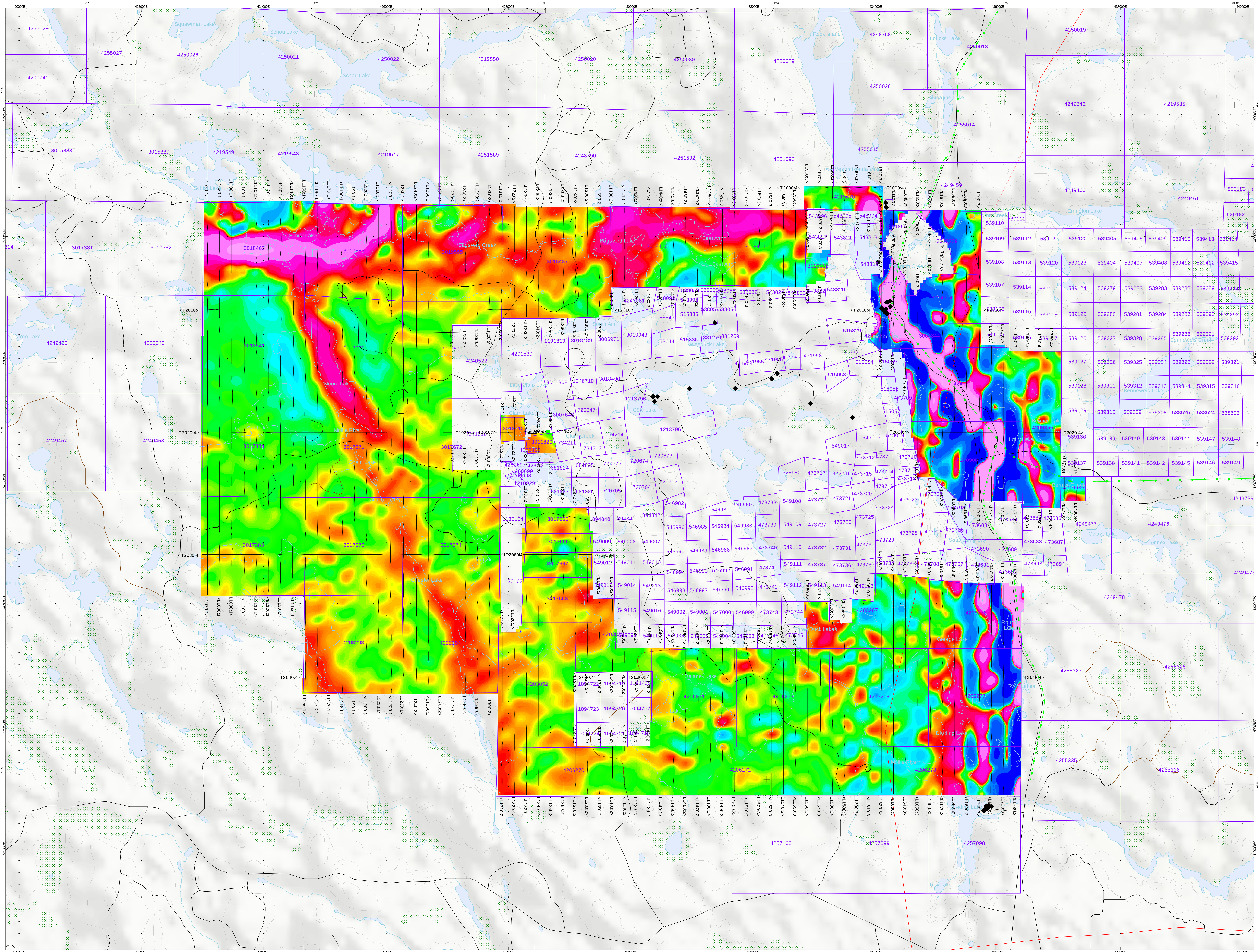
The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM (Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

Sanatana Resources Inc.
Watershed Block
Gogama, Ontario

Geotech ZTEM System
360Hz In-Phase Total Divergence (DT) Grid

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

May 2011



GEOTECH LTD.

SURVEY SPECIFICATIONS:

Survey Flying Date: April 4th to 19th, 2011
Survey Operations Base: Gogama, Ontario
Nominal Survey Line Spacing: 200 Meters
Nominal Survey Line Direction: N 0° E / N 180° E
Nominal Survey Tie Line Spacing: 2000 Meters
Nominal Survey Tie Line Direction: N 90° E / N 270° E
Helicopter Mean Terrain Clearance: 151 metres
Mean Ground Air Speed: 25 metres/sec
ZTEM airborne coil: towed at a mean distance of 74 m below the helicopter
Airborne Magnetometer bird: towed at a mean distance of 57 m below the helicopter

HELICOPTER SPECIFICATIONS

Helicopter Type: Aerospatiale A-Star 350 B3 (C-GEOZ)

AIRBORNE INSTRUMENTATION

Survey Type: Helicopter Z-Axis Tipper Electromagnetic (ZTEM), Magnetic towed Bird
GPS Receivers (4): NovAtel CDGPS enabled Propak V3-RT20
GPS Receivers Location: One on the helicopter, three on EM coil
Radar Altimeter: Terra TRA 3000/TRI 40
Navigation: GEONAV-3

AIRBORNE ELECTROMAGNETIC SYSTEM

Electromagnetic System: Geotech Z-Axis Tipper (ZTEM)
Coil dimensions: 7.4 metres diameter
Coil orientation: Vertical Dipole
Digitizing rate: 2000Hz

AIRBORNE MAGNETOMETER

Magnetometer: GEOMETRICS
Magnetometer Sensitivity: +/- 0.02 nT
Sampling Rate: 0.2 Hz

GROUND INSTRUMENTATION

MAGNETIC BASE STATION

Magnetometer: GEOMETRICS
Base Station Location: Behind Gogama Lodge (47°40'34.67 N, 81°40'50.57 W)

EM BASE STATION

Two orthogonal square coils
Coil dimensions: 3.5 metres each side
Coil orientation: Horizontal Dipole
Base Station Location: off unused dirt road (47°34'19.6 N, 82°10'47.0 W)
Azimuth : AzA = N 90° E AzB = N 180° E

PROCESSING SUMMARY

MAGNETICS:

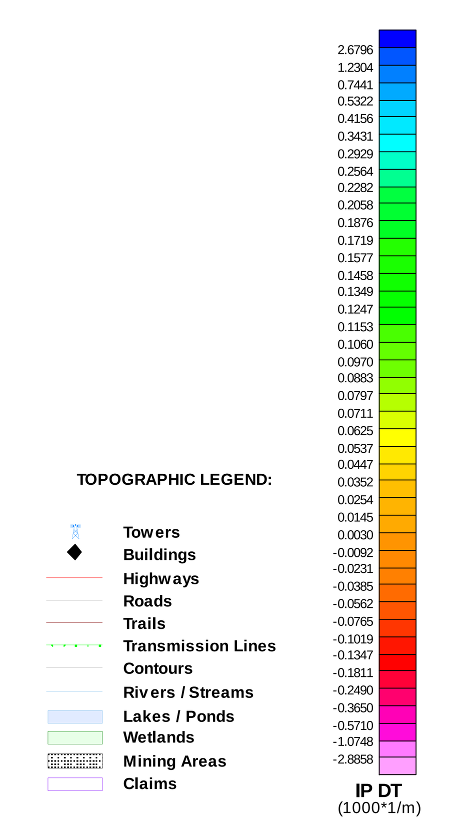
Diurnal Subtraction, microlevelling

ZTEM:

Frequencies extracted: 30, 45, 90, 180, 360, 720Hz.
Sampling rate: 0.4 sec.
Rotation of the inphase part of the inline and orthogonal components (Z/Xloc and Z/Yloc)on to UTM Eastings and Northings.
Attitude correction applied, (calculated from 3 GPS recievers installed on aiborne coil).
DIV(Tilt) calculated: dXcomp/dX+dYcomp/dY for all 6 frequencies.
Phase Rotated Grids (90 deg) calculated from each individual X and Y component grids, for each individual frequency.

MAP PROJECTION

Datum: WGS 84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.0
Eccentricity: 0.0818191908 4
NTS: 041O09, 041P12, 041O08, 041P05



Scale 1:20000
250 0 250 500 750 1000
(meters)
WGS 84 / UTM zone 17N

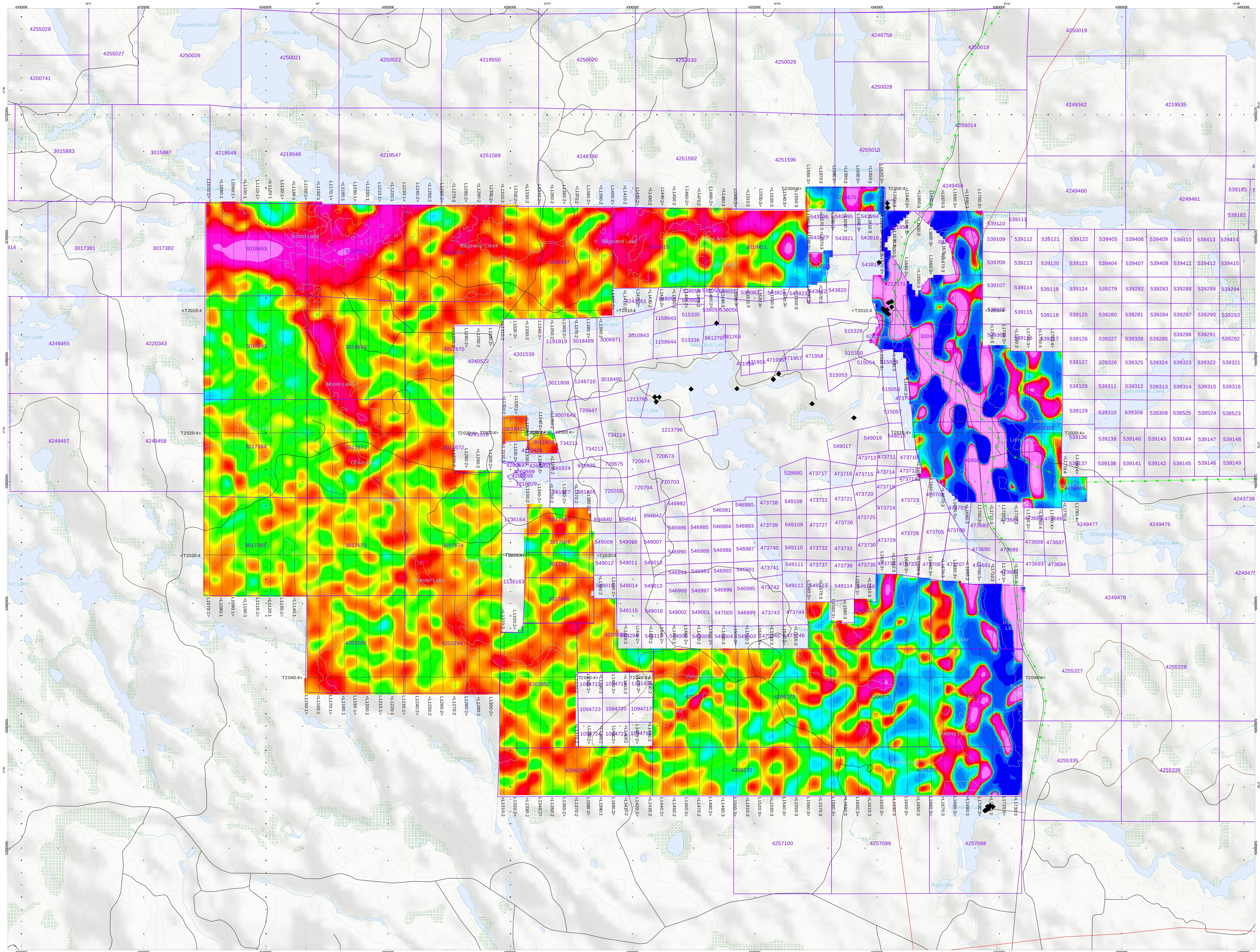
The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM(Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

Sanatana Resources Inc.
Watershed Block
Gogama, Ontario

Geotech ZTEM System
90Hz In-Phase Total Divergence (DT) Grid

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

May 2011



GEOTECH LTD.

SURVEY SPECIFICATIONS:

Survey Flying Date: April 4th to 19th, 2011
Survey Operations Base: Gogama, Ontario
Nominal Survey Line Spacing: 200 Meters
Nominal Survey Line Direction: N 0° E / N 180° E
Nominal Survey Tie Line Spacing: 2000 Meters
Nominal Survey Tie Line Direction: N 90° E / N 270° E
Helicopter Mean Terrain Clearance: 151 metres
Mean Ground Air Speed: 25 metres/sec
ZTEM airborne coil: towed at a mean distance of 74 m below the helicopter
Airborne Magnetometer bird: towed at a mean distance of 57 m below the helicopter

HELICOPTER SPECIFICATIONS

Helicopter Type: Aerospatiale A-Star 350 B3 (C-GEOZ)

AIRBORNE INSTRUMENTATION

Survey Type: Helicopter Z-Axis Tipper Electromagnetic (ZTEM), Magnetic towed Bird
GPS Receivers (4): NovAtel CDGPS enabled Propak V3-RT20
GPS Receivers Location: One on the helicopter, three on EM coil
Radar Altimeter: Terra TRA 3000/TRI 40
Navigation: GEONAV-3

AIRBORNE ELECTROMAGNETIC SYSTEM

Electromagnetic System: Geotech Z-Axis Tipper (ZTEM)
Coil dimensions: 7.4 metres diameter
Coil orientation: Vertical Dipole
Digitizing rate: 2000Hz

AIRBORNE MAGNETOMETER

Magnetometer: GEOMETRICS
Magnetometer Sensitivity: +/- 0.02 nT
Sampling Rate: 0.2 Hz

GROUND INSTRUMENTATION

MAGNETIC BASE STATION

Magnetometer: GEOMETRICS
Base Station Location: Behind Gogama Lodge (47°40'34.67 N, 81°40'50.57 W)

EM BASE STATION

Two orthogonal square coils
Coil dimensions: 3.5 metres each side
Coil orientation: Horizontal Dipole
Base Station Location: off unused dirt road (47°34'19.6 N, 82°10'47.0 W)
Azimuth : AzA = N 90° E AzB = N 180° E

PROCESSING SUMMARY

MAGNETICS:

Diurnal Subtraction, microlevelling

ZTEM:

Frequencies extracted: 30, 45, 90, 180, 360, 720Hz.
Sampling rate: 0.4 sec.
Rotation of the inphase part of the inline and orthogonal components (Z/Xloc and Z/Yloc)on to UTM Eastings and Northings.
Attitude correction applied, (calculated from 3 GPS recievers installed on aiborne coil).
DIV(Tilt) calculated: dXcomp/dX+dYcomp/dY for all 6 frequencies.
Phase Rotated Grids (90 deg) calculated from each individual X and Y component grids, for each individual frequency.

MAP PROJECTION

Datum: WGS 84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.0
Eccentricity: 0.0818191908 4
NTS: 041O09, 041P12, 041O08, 041P05

TOPOGRAPHIC LEGEND:

Towers
Buildings
Highways
Roads
Trails
Transmission Lines
Contours
Rivers / Streams
Lakes / Ponds
Wetlands
Mining Areas
Claims

IP DT
(1000*1/m)

Scale 1:20000
250 0 250 500 750 1000
(meters)
WGS 84 / UTM zone 17N

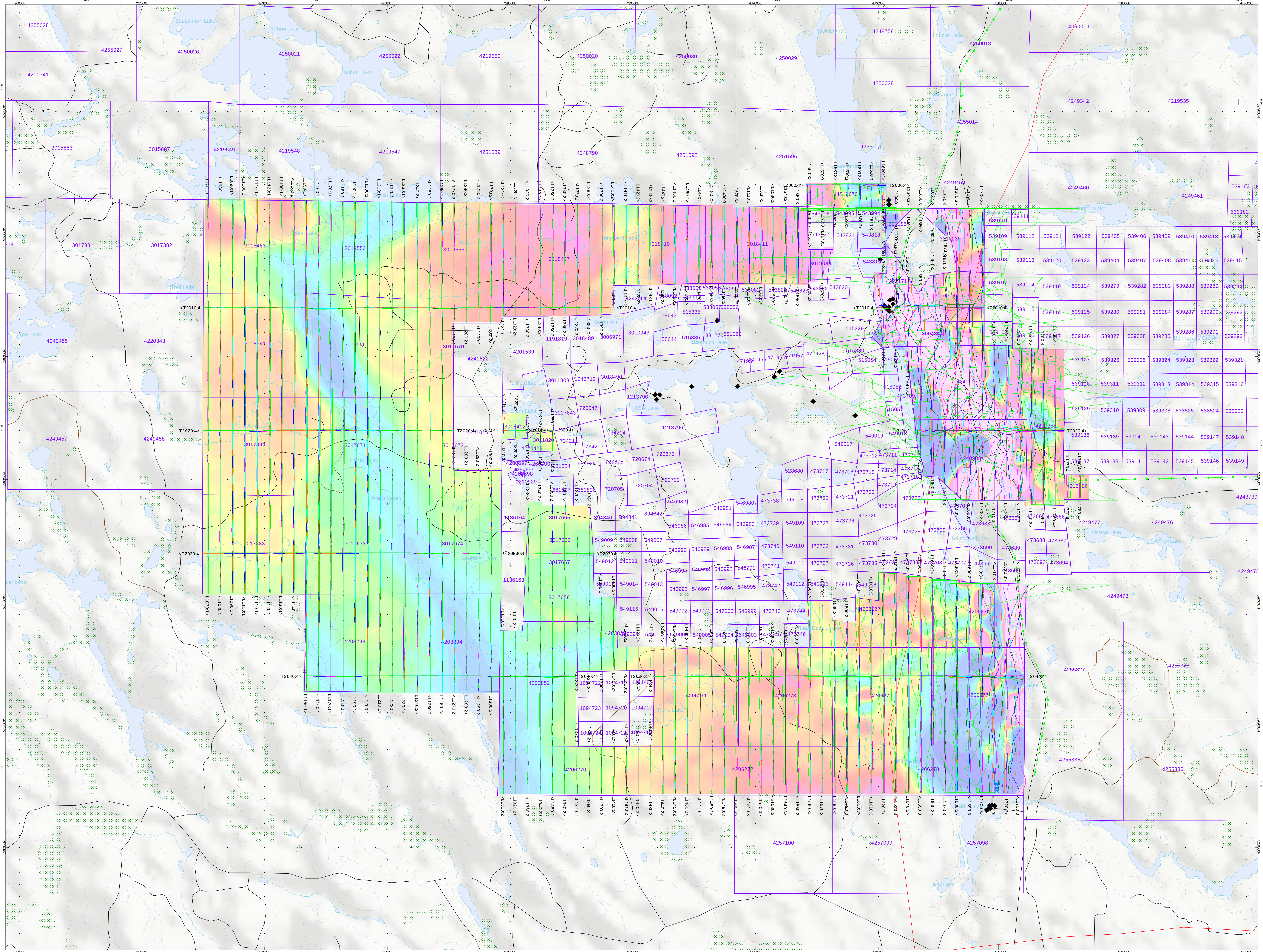
The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM (Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

Sanatana Resources Inc.
Watershed Block
Gogama, Ontario

Geotech ZTEM System
30Hz In-Phase Total Divergence (DT) Grid

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

May 2011



GEOTECH LTD.

Scale 1:10,000,000

SURVEY SPECIFICATIONS:

Survey Flying Date: April 4th to 19th, 2011
Survey Operations Base: Gogama, Ontario
Nominal Survey Line Spacing: 200 Meters
Nominal Survey Line Direction: N 0° E / N 180° E
Nominal Survey Tie Line Spacing: 2000 Meters
Nominal Survey Tie Line Direction: N 90° E / N 270° E
Helicopter Mean Terrain Clearance: 151 metres
Mean Ground Air Speed: 25 metres/sec
ZTEM airborne coil: towed at a mean distance of 74 m below the helicopter
Airborne Magnetometer bird: towed at a mean distance of 57 m below the helicopter

HELICOPTER SPECIFICATIONS

Helicopter Type: Aerospatiale A-Star 350 B3 (C-GEOZ)

AIRBORNE INSTRUMENTATION

Survey Type: Helicopter Z-Axis Tipper Electromagnetic (ZTEM), Magnetic towed Bird
GPS Receivers (4): NovAtel CDGPS enabled Propak V3-RT20
GPS Receivers Location: One on the helicopter, three on EM coil
Radar Altimeter: Terra TRA 3000/TRI 40
Navigation: GEONAV-3

AIRBORNE ELECTROMAGNETIC SYSTEM

Electromagnetic System: Geotech Z-Axis Tipper (ZTEM)
Coil dimensions: 7.4 metres diameter
Coil orientation: Vertical Dipole
Digitizing rate: 2000Hz

AIRBORNE MAGNETOMETER

Magnetometer: GEOMETRICS
Magnetometer Sensitivity: +/- 0.02 nT
Sampling Rate: 0.2 Hz

GROUND INSTRUMENTATION

MAGNETIC BASE STATION

Magnetometer: GEOMETRICS
Base Station Location: Behind Gogama Lodge (47°40'34.67 N, 81°40'50.57 W)

EM BASE STATION

Two orthogonal square coils
Coil dimensions: 3.5 metres each side
Coil orientation: Horizontal Dipole
Base Station Location: off unused dirt road (47°34'19.6 N, 82°10'47.0 W)
Azimuth : AzA = N 90° E AzB = N 180° E

PROCESSING SUMMARY

MAGNETICS:

Diurnal Subtraction, microlevelling

ZTEM:

Frequencies extracted: 30, 45, 90, 180, 360, 720Hz.
Sampling rate: 0.4 sec.
Rotation of the inphase part of the inline and orthogonal components (Z/Xloc and Z/Yloc)on to UTM Eastings and Northings.
Attitude correction applied, (calculated from 3 GPS recievers installed on aiborne coil).
DIV(Tilt) calculated: dXcomp/dX+dYcomp/dY for all 6 frequencies.
Phase Rotated Grids (90 deg) calculated from each individual X and Y component grids, for each individual frequency.

MAP PROJECTION

Datum: WGS 84
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17N)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.0
Eccentricity: 0.0818191908 4
NTS: 041O09, 041P12, 041O08, 041P05

Quadrature Frequencies
0.25 units per mm
Profile Base 0

30 Hz
45 Hz
90 Hz
180 Hz
360 Hz
720 Hz

TOPOGRAPHIC LEGEND:

Towers
Buildings
Highways
Roads
Trails
Transmission Lines
Contours
Rivers / Streams
Lakes / Ponds
Wetlands
Mining Areas
Claims

90Hz Tzy QD

Scale 1:20000

250 0 250 500 750 1000

(meters)

WGS 84 / UTM zone 17N

The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
Background shading is derived from NASA SRTM(Shuttle Radar Topography Mission) data
Inset data derived from Geocommunities 1:250,000 Canadian National Topographic database
Mining Claims are derived from the Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

Sanatana Resources Inc.
Watershed Block
Gogama, Ontario

Geotech ZTEM System

Tzy (Cross-line) Quadrature Profiles over 90Hz Phase Rotated Quadrature Grid

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

May 2011