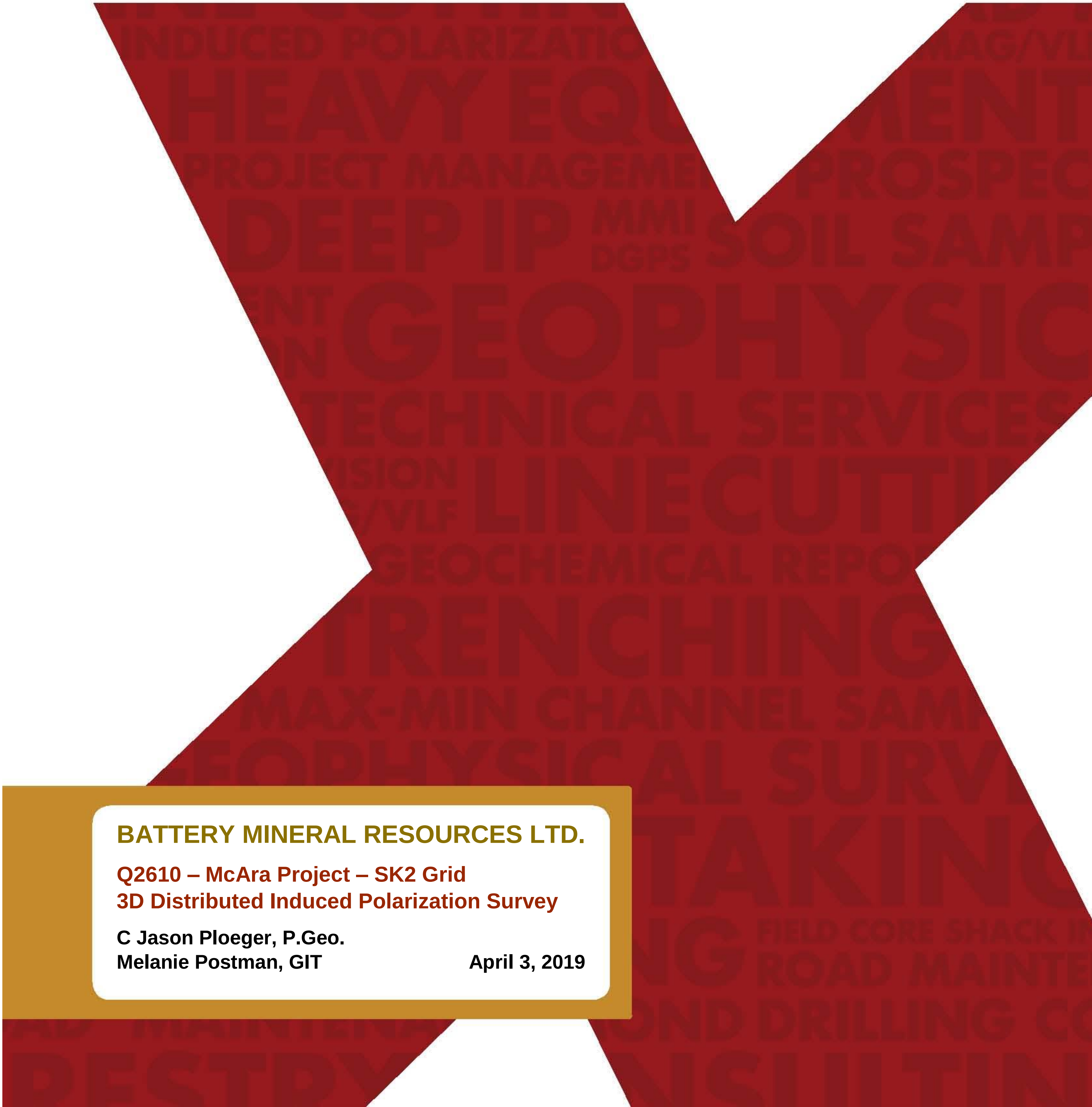
CANADIAN EXPLORATION SERVICES LTD



BATTERY MINERAL RESOURCES LTD.

Q2610 – McAra Project – SK2 Grid
3D Distributed Induced Polarization Survey

C Jason Ploeger, P.Geo.
Melanie Postman, GIT

April 3, 2019

Abstract

Canadian Exploration Services Limited (CXS) was contracted to perform a detailed 3D Distributed IP (3D IP) survey on Battery Mineral Resources Limited's McAra Project – SK2 Grid. The survey was designed to investigate a part of the project area for mineralized systems based on an airborne EM target.

The 3D IP survey highlighted three narrow, short, and linear chargeability and low resistivity anomalies. These anomalies appear parallel to each other and most likely represent interflow sediments.

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Contributions by Andrew Salerno (B.Sc.) & Mandy Lim (GIT)

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1. SURVEY DETAILS

1.1 PROJECT NAME

This project is known as the **McAra Project – SK2 Grid**.

1.2 CLIENT

Battery Mineral Resources Limited

Level 36
Governor Phillip Tower
1 Farer Place
Sydney
Australia

1.3 OVERVIEW

In the winter of 2019, Canadian Exploration Services Limited (CXS) performed a detailed 3D Distributed Induced Polarization (3D IP) survey for Battery Mineral Resources Limited over the McAra Project, SK2 Grid. A total of 13.95-line kilometres of current injection was performed at an injection interval of 50m. This consisted of 260 injection locations that spanned a footprint of 1.62 km^2. The survey was performed between March 12th and March 28th, 2019.

1.4 OBJECTIVE

The objective of the 3D distributed IP survey was to perform a multidirectional reconnaissance survey of the area. Targeting was based off a recent airborne EM survey.

1.5 SURVEY & PHYSICAL ACTIVITIES UNDERTAKEN

Survey/Physical Activity	Dates	Total Days in Field	Total Line Kilometres
Line Cutting	March 6 to March 12, 2019	7	13.95
3D Distributed IP	March 12 to March 28, 2019	14	13.95

Table 1: Survey and Physical Activity Details

1.6 SUMMARY OF RESULTS, CONCLUSIONS & RECOMMENDATIONS

A total of 9684 filtered data points was collected from this 3D IP survey. An inversion model of the resistivity and chargeability was produced with a depth up to 360 metres.

The 3D IP survey highlighted three narrow, short, and linear chargeability and low resistivity anomalies. These anomalies appear parallel to each other and most likely represent interflow sediments.

1.7 CO-ORDINATE SYSTEM

Projection: UTM zone 17N
Datum: NAD83
UTM Coordinates near center of grid: 499948 Easting, 5253350 Northing

2. SURVEY LOCATION DETAILS

2.1 LOCATION

The McAra Project – SK2 Grid is in North Williams Township, approximately 30 kilometres southwest of Gowganda, Ontario or 24 km southeast of Shining Tree, Ontario.

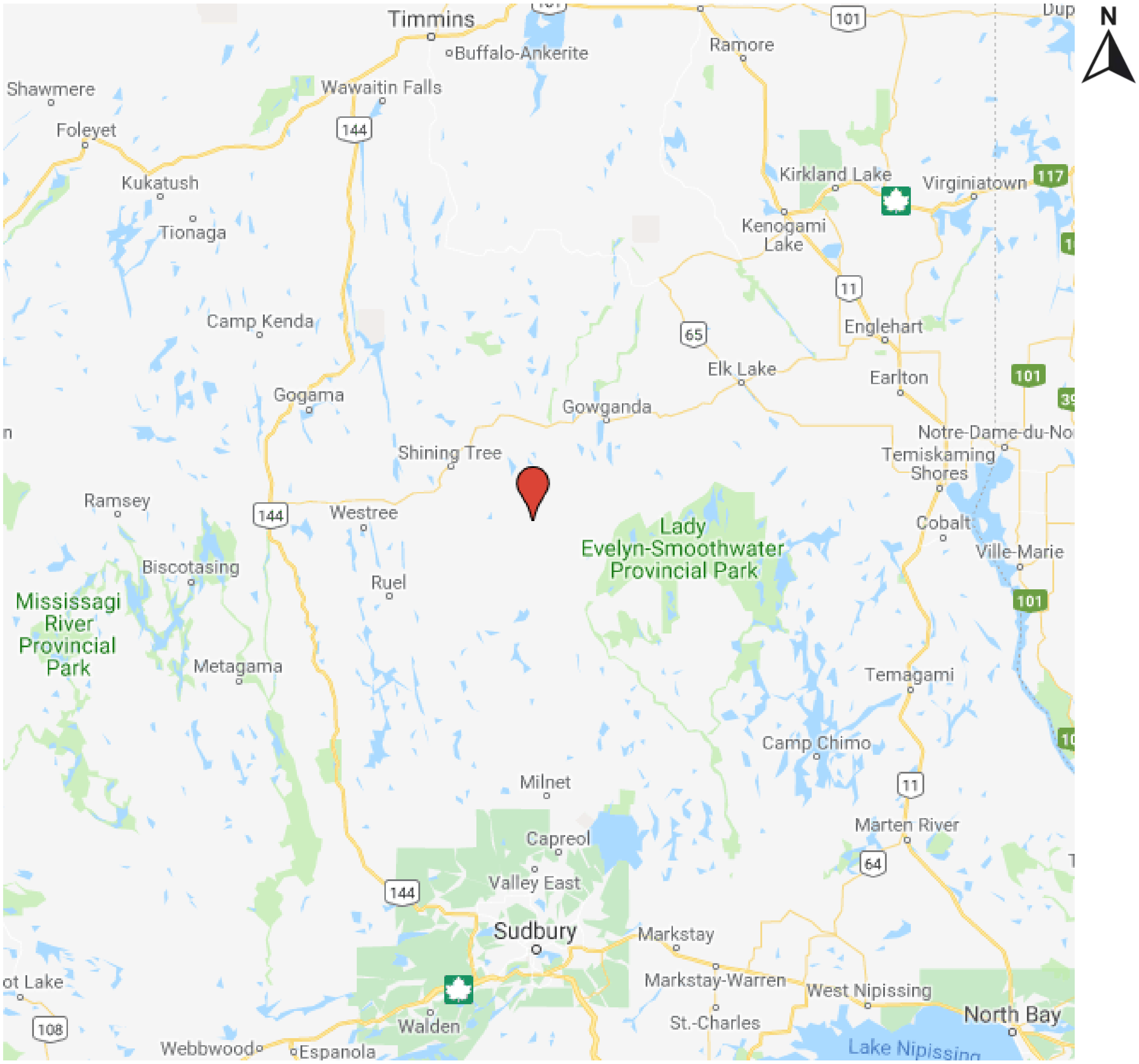

Figure 1: Location of the SK2 Grid (Map data ©2019 Google)

2.2 ACCESS

Access to the property was attained with a 4x4 truck via Beauty Lake Road. Beauty Lake Road heads south from Hwy 560, approximately 23 kilometres west of Elk Lake, Ontario. Beauty Lake Road was travelled for approximately 50 kilometres to the trail. From here a series of trails were taken by snowmobiles for the final 10 kilometres to the survey area.

2.3 MINING CLAIMS

The survey area covers a portion of mining claims 322300, 322299, 188543, 273660, 102821, 344675, 183110, 170296, 170298, 266197, 170297, 208256, 221117 and 155764 located in North Williams Township, within the Larder Lake Mining Division.

Cell Number	Provincial Grid Cell ID	Ownership of Land	Township
322300	41P06I299	Battery Mineral Resources Limited	North Williams
322299	41P06I300	Battery Mineral Resources Limited	North Williams
188543	41P07L281	Battery Mineral Resources Limited	North Williams
273660	41P07L282	Battery Mineral Resources Limited	North Williams
102821	41P06I319	Battery Mineral Resources Limited	North Williams
344675	41P06I320	Battery Mineral Resources Limited	North Williams
183110	41P07L301	Battery Mineral Resources Limited	North Williams
170296	41P07L302	Battery Mineral Resources Limited	North Williams
170298	41P06I339	Battery Mineral Resources Limited	North Williams
266197	41P06I340	Battery Mineral Resources Limited	North Williams
170297	41P07L321	Battery Mineral Resources Limited	North Williams
208256	41P07L322	Battery Mineral Resources Limited	North Williams
221117	41P06I360	Battery Mineral Resources Limited	North Williams
155764	41P07L341	Battery Mineral Resources Limited	North Williams

Table 2: Mining Lands and Cells Information

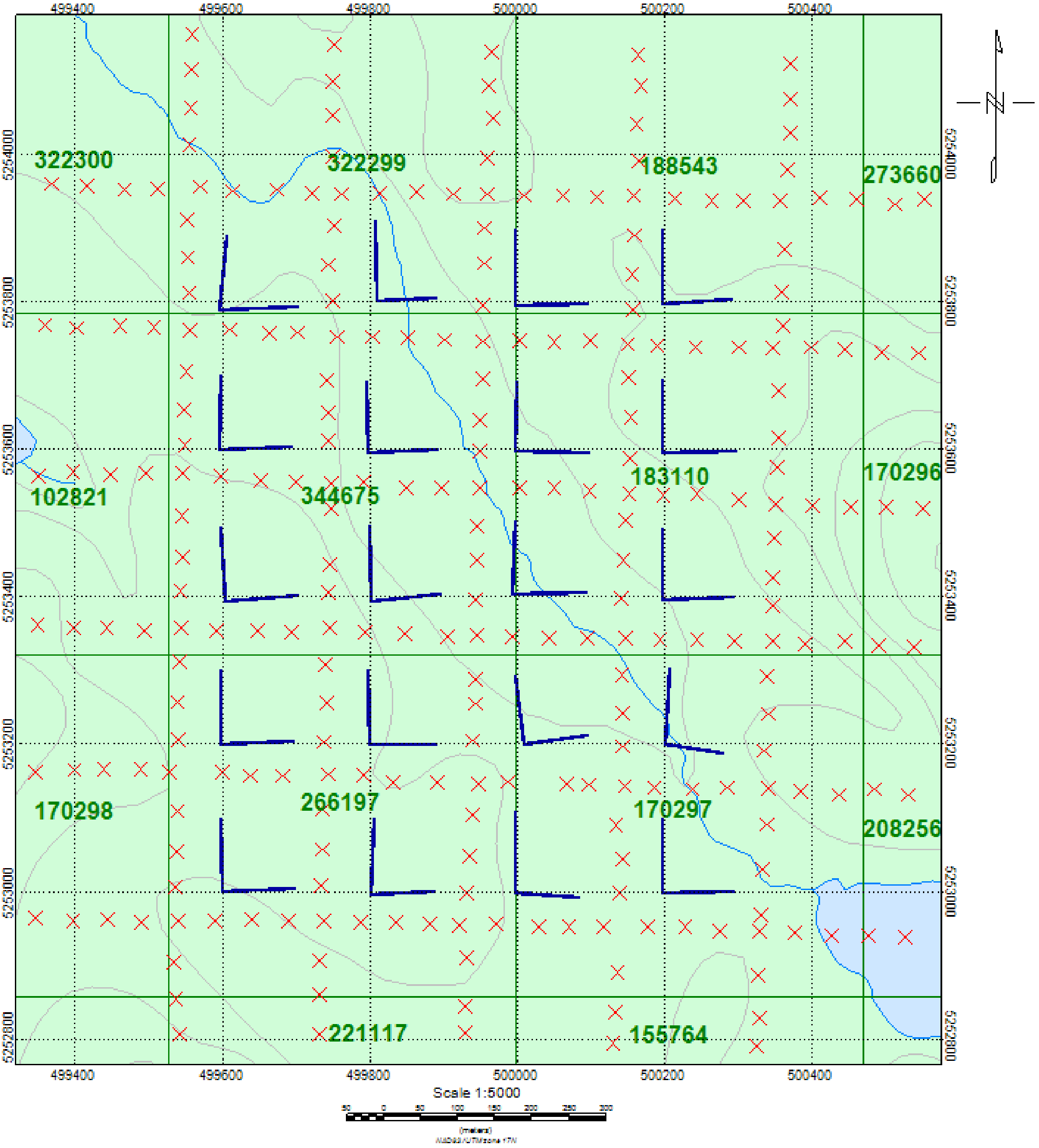

Figure 2: Operational Claim Map with 3D IP Electrode Sites – Red=Transmit Locations – Blue=Read Dipole

2.4 PROPERTY HISTORY

A lot of historical exploration has been carried out over the years all over the survey area. The following list describes details of the previous geoscience work which was collected by the Mines and Minerals division and provided by OGSEarth (MNDM & OGSEarth, 2018).

- **1998: Minescape Expl Inc (File 41P07NW2005)**

Airborne Geophysical Survey – Ray Township

Minescape was contracted with Geoterrex to fly airborne survey mag and EM in an area south of Shinning Tree. The survey was conducted January 5th to 14th, 1998. The magnetometer survey indicated a highly variable magnetic survey which is unlikely to be caused by granite.

- **1998: Minescape Expl Inc (File 41P07NW2001)**

Airborne Geophysical Survey – North Williams Township

Minescape contracted with Geoterrex to fly airborne survey mag and EM. The magnetic signature of the bedrock is highly variable which suggests that the bedrock is Archean green stone and not granite as the government maps indicate. The only distinguishable features are mafic dykes (olivine diabase) striking in southeasterly to northwesterly direction.

- **1998: Minescape Expl Inc (File 41P07NW2004)**

Line Cutting and Ground Geophysical Surveys – North Williams Township

The HLEM survey consisted of a total distance of 7 km and was surveyed February 23rd and 24th, 1998. Previous survey lines were not identifiable, so fresh lines had to be cut. Drilling of the two discovered anomalies was recommended.

- **1998–2001: Wallbridge Mining Company Limited (File 41P07NW2007)**

Diamond Drilling and Geochemical Assaying – North Williams Township

Two diamond drill holes were completed for Wallbridge Mining Company. DDH WLK-01 was drilled from November 27th to December 1st, 1999. DDH WLK-02 was drilled from December 2nd to December 5th, 1999.

- **2007: Roy Annett (File 20000002294)**

Overburden Stripping and Geochemical Sampling – Dufferin Township

During the period of April 11th to the 15th, 2007, Larry Salo, was in Dufferin Township and moved an excavator to the Kite Lake area to carry out stripping and trenching on the main Kite Lake showing. Also proceeding north of Kite Lake to attempt to locate the source of a discreet AER anomaly from the Wallbridge survey of 1998. The trenching effort returned significant values from the South Kite area while the North Kite trenching was unable to reach the main AEM anomaly and did not return good values of copper and zinc near the south trace of the zone.

- **2008: Roy Annett (File 20000003224)**

Overburden Stripping – Dufferin Township

Roy Annett along with Larry Salo utilized Salo's Link Belt Excavator and other mobile equipment to carry out a stripping program in the North Williams and Dufferin townships. The work started April of 2008 and was carried out intermittently until early August.

- **2016: Battery Mineral Resources Limited (File 20000015781)**

Airborne Geophysical Survey – Donovan Townships

Precision GeoSurveys conducted an airborne magnetometer and radiometric surveys over 12 024 line-km of land for the Cobalt Project. Geophysical maps were generated with data obtained, but no solid interpretation was made. Additional geophysical surveying was recommended for accurate interpretation of airborne data collected.

2.5 GENERAL REGIONAL/LOCAL GEOLOGICAL SETTINGS

Regional Geology:

The project area occurs within the Superior Province that is composed of northeast trending Paleo- to Neoarchean gneissic complexes, granite-greenstone terranes, and sedimentary basins that were assembled by repeated island arc-microcontinent collisions (Bauer et al., 2011). The McAra project partially comprises Paleoproterozoic (2.5-2.2 Ga) metasedimentary rocks of the Huronian Supergroup (HS) that form a ~60,000 km2 irregular-shaped siliciclastic paleo-basin, colloquially known as the Cobalt Embayment (Potter and Taylor, 2009). The HS unconformably overlies complexly folded and subvertically dipping Neoarchean volcanic, intrusive, and sedimentary rocks of the Wawa-Abitibi terrane that forms the southernmost subprovince of the Canadian portion of the Superior Province (Stott et al., 2010; Stott, 2011; Lodge, 2013). Both Archean rocks and the HS were intruded by Nipissing Diabase sills that are primarily tholeiitic and were sourced from MORB-type parental magma (Potter and Taylor, 2009). These intrusive rocks were emplaced along reactivated pre-HS faults at ca. 2,219 (Corfu and Andrews, 1986) and are envisioned as the heat source that drove hydrothermal fluid circulation responsible for Ag-Co mineralization.

Archean Rocks:

Archean rocks in the region are part of the Wawa-Abitibi subprovince and dominantly comprise mafic to felsic volcanic and volcanoclastic rocks, syn- to post-volcanic intrusions and lesser siliciclastic and chemical sedimentary rocks deposited at ca. 2.7 Ga. The volcanic rocks were deposited in an oceanic arc setting during collision between the Wawa terrane and the Superior Craton in the Neoarchean time period. Paleotectonic settings (e.g., arc, back-arc, rifted arc) and crustal architecture and thickness varies both between and within greenstone belts in the Wawa-Abitibi terrane, which has resulted in a diverse petrogenesis of igneous rocks and related mineralization styles (Mercier-Langevin et al., 2014).

Deformation in the Archean resulted in tight folding and tilting of the rocks to subvertical dips. The stress field was also accommodated by thrust faulting as evidenced by duplication of rock sequences and implied in areas where strain intensity is too low to account for the subvertical rock orientations. Major thrust faults may have been reactivated as deep-seated normal faults developed during extension and deposition of the volcanic facies (Bleeker, 2015). After Archean deformation and deposition of the Huronian Supergroup, the rocks were deformed during the Penokean orogeny that resulted in local reactivation of faults developed in the Archean and Proterozoic (Potter and Taylor, 2009).

Paleoproterozoic Huronian Supergroup:

The Huronian Supergroup comprises a southward-thickening sequence of mainly siliciclastic sedimentary rocks that reach a maximum thickness of 12 km in the southern part of the basin but have an estimated thickness of ~6 km near Cobalt, Ontario (Young et al., 2001). The HS is subdivided in Lower and Upper Huronian. The Lower Huronian comprises, from top to bottom, the Elliot Lake, Hough Lake, and Quirke Lake groups, while the Upper Huronian is solely composed of the Cobalt group. The Lower Huronian has a restricted distribution and was deposited in a rift controlled, non-marine environment. After a significant hiatus, deposition of the more homogenous Upper Huronian is interpreted to have taken place at a passive margin under submarine conditions (Young et al., 2001).

Inversion of the Huronian basin resulted in lower greenschist metamorphism of the sedimentary rocks and caused basin-scale hydrothermal fluid flow that resulted in regionally extensive Na and Ca alteration of the rocks (Potter and Taylor, 2009).

Property Geology:

Most of the North Williams township is covered by flat lying sediments of the Huronian Supergroup. These are mainly quartzites and quartz-pebble conglomerates of the Lorrain Formation. Intruding these sedimentary sequences are dykes and sills of Nipissing diabase.

Archean basement rock is found as isolated outliers northwest of McKee Lake in Dufferin township and extend to the north into the southern part of North Williams township. These formations which consist mostly of mafic metavolcanic and metasedimentary rocks host most of the mineralization found in the area. Intruding these units and underlying the Huronian is a body of dark red, coarse grained granite.

2.6 TARGET OF INTEREST

The targeting of the survey was to investigate favorable geology that exhibited a similar airborne EM signature to a nearby massive sulphide deposit.

3. PLANNING

3.1 EXPLORATION PERMIT/PLAN

The 3D Distributed Induced Polarization survey was performed over mining claims held by Battery Mineral Resources Limited. This required plan PL-18-010896 for the entire area of the survey coverage.

3.2 SURVEY DESIGN

Specialized IP survey design software was used as a tool to assist in the targeting of the survey. In this case a theoretical survey distribution scenario was established to determine the survey results coverage.

For optimal coverage, 20 receivers with 3 read electrodes each were planned in selected locations in between the current injection paths. The 3 read electrodes of each receiver were planned in 2 orthogonal directions, with 100-metre dipole lengths (north-south and east-west). Current injections were planned at 50 intervals along cut lines. An infinite was planned far from the survey location to achieve a pole-dipole array scenario. A theoretical depth of 450 metres was obtained from the software with this layout.

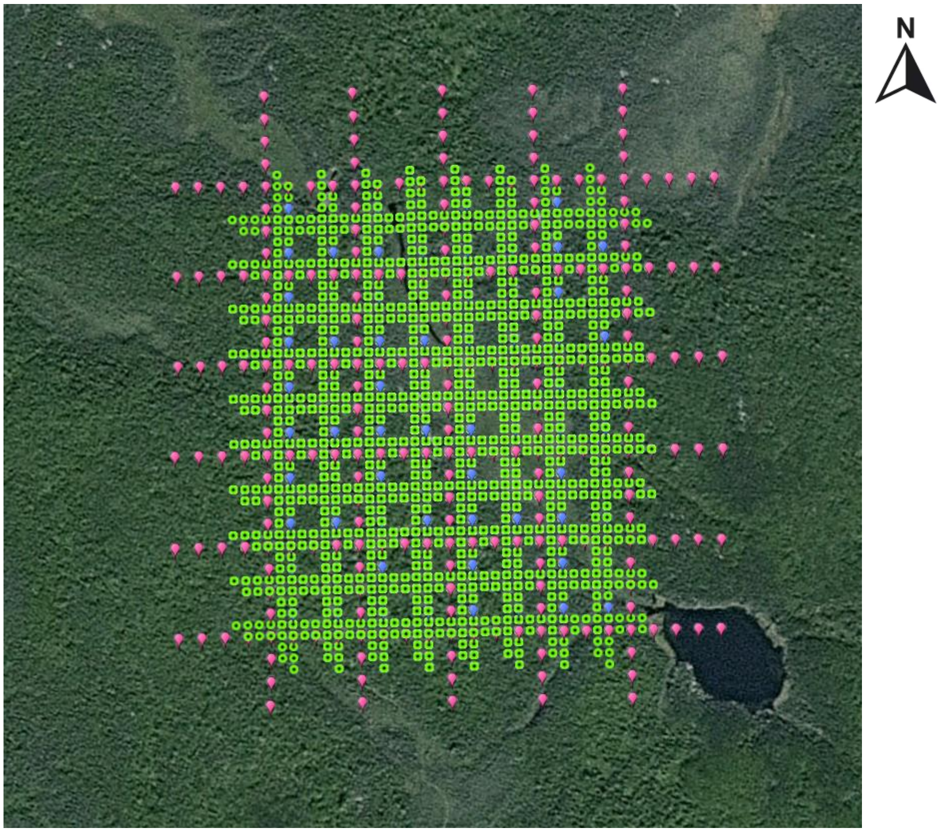

Figure 3: Survey Design Model Looking Down – Pink=Current Injection, Blue=Receiver Electrodes, Green=Theoretical Data Point (©2018 Google, Image ©2019 CNES/Airbus)

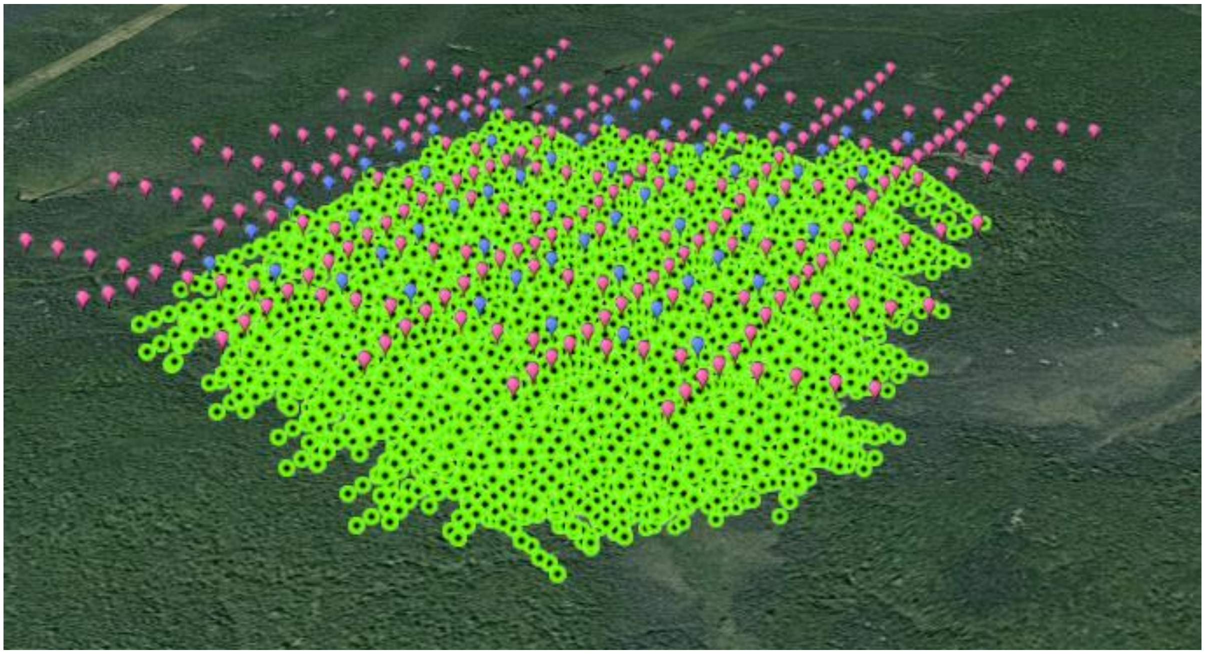

Figure 4: Survey Design Model Looking Northwest – Pink=Current Injection, Blue=Receiver Electrodes, Green=Theoretical Data Point (©2018 Google, Image ©2019 CNES/Airbus)

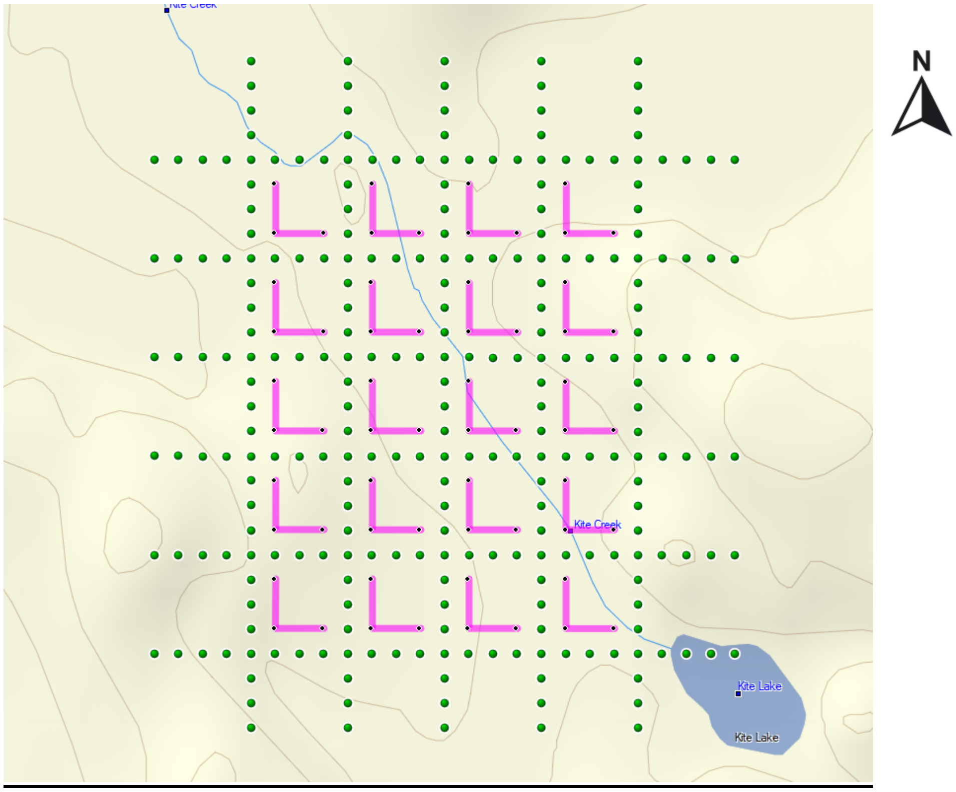

Figure 5: Planned Survey Layout – Green Circles=Current Injections, Pink Lines=Dipoles, Black Dots=Read Electrodes, Red Circle=Pseudo-Infinite

4. SURVEY WORK UNDERTAKEN

4.1 SUMMARY

CXS was contracted to cut a grid and perform a 3D Distributed Induced Polarization survey over the SK2 Area for the McAra Project. The CXS crew occupied the site in March of 2019. A total length of 13.95 kilometers was covered with 260 injected current points for this survey occurring between March 12th and March 28th, 2019. True GPS locations were collected upon setting up the grid and utilized as field electrode locations for data processing. The survey area footprint was 1.62 km^2 (1200m x 1350m).

4.2 SURVEY GRID

A grid was cut along the intended current injection paths. The grid consisted of 5 north-south lines spaced at 200-metre intervals and 6 east-west lines spaced at 200-metre intervals, with stations picketed at 25-metre intervals (Figure 6). All lines were cut by Five on Line Contracting based out of Belleterre, Quebec in March 2019.

Figure 6: Survey Grid Image (©2018 Google, Image ©2019 CNES/Airbus)

4.3 SURVEY SETUP

20 receivers were placed in 20 previously selected locations scattered between the grid lines. Each receiver was connected to 2 approximately orthogonal, ~100-metre dipoles (north-south and east-west). The coordinates of the read electrodes were recorded by GPS and are listed in Table 3. Due to field conditions exact locations and directions were not always achieved. The infinite was located approximately 4.9 km south-southeast from the centre of the survey area at 501392E, 5248782N to achieve a pole-dipole array scenario. The survey layout covered a footprint of 1.62 km^2 with dimensions of 1.2 km (X) x 1.35 km (Y).

Read Electrode	UTM X (m)	UTM Y (m)	Read Electrode	UTM X (m)	UTM Y (m)
402-P1	499607	5253890	412-P1	499998	5253503
402-P2	499597	5253791	412-P2	499995	5253405
402-P3	499700	5253792	412-P3	500093	5253407
403-P1	499809	5253910	413-P1	500198	5253492
403-P2	499811	5253803	413-P2	500197	5253397
403-P3	499890	5253802	413-P3	500292	5253398
404-P1	499999	5253898	414-P1	500207	5253303
404-P2	499999	5253796	414-P2	500202	5253201
404-P3	500097	5253796	414-P3	500279	5253188
405-P1	500198	5253898	415-P1	499999	5253292
405-P2	500198	5253798	415-P2	500010	5253201
405-P3	500294	5253802	415-P3	500097	5253212
406-P1	500197	5253695	416-P1	499799	5253300
406-P2	500198	5253597	416-P2	499801	5253200
406-P3	500300	5253596	416-P3	499896	5253199
407-P1	500001	5253693	417-P1	499599	5253300
407-P2	499998	5253599	417-P2	499599	5253200
407-P3	500098	5253596	417-P3	499698	5253202
408-P1	499797	5253693	418-P1	499599	5253099
408-P2	499799	5253596	418-P2	499600	5253002
408-P3	499892	5253599	418-P3	499697	5253003
409-P1	499599	5253700	419-P1	499806	5253099
409-P2	499596	5253601	419-P2	499802	5252997
409-P3	499693	5253602	419-P3	499889	5252999
410-P1	499599	5253495	420-P1	499999	5253109
410-P2	499605	5253394	420-P2	499999	5252999
410-P3	499701	5253400	420-P3	500084	5252994
411-P1	499800	5253497	421-P1	500198	5253099
411-P2	499803	5253395	421-P2	500198	5252999
411-P3	499899	5253401	421-P3	500296	5252996

Table 3: Receiver Electrode Coordinates

4.4 DATA ACQUISITION

CXS began acquiring data on March 21, 2019. Current injection sites were injected along the grid lines at approximately 50-metre increments. GPS points were collected at each injection rod location prior to each current injection and recorded along with their respective injection details, such as injection file numbers and ground conditions. There was a total of 260 injection locations for this survey.

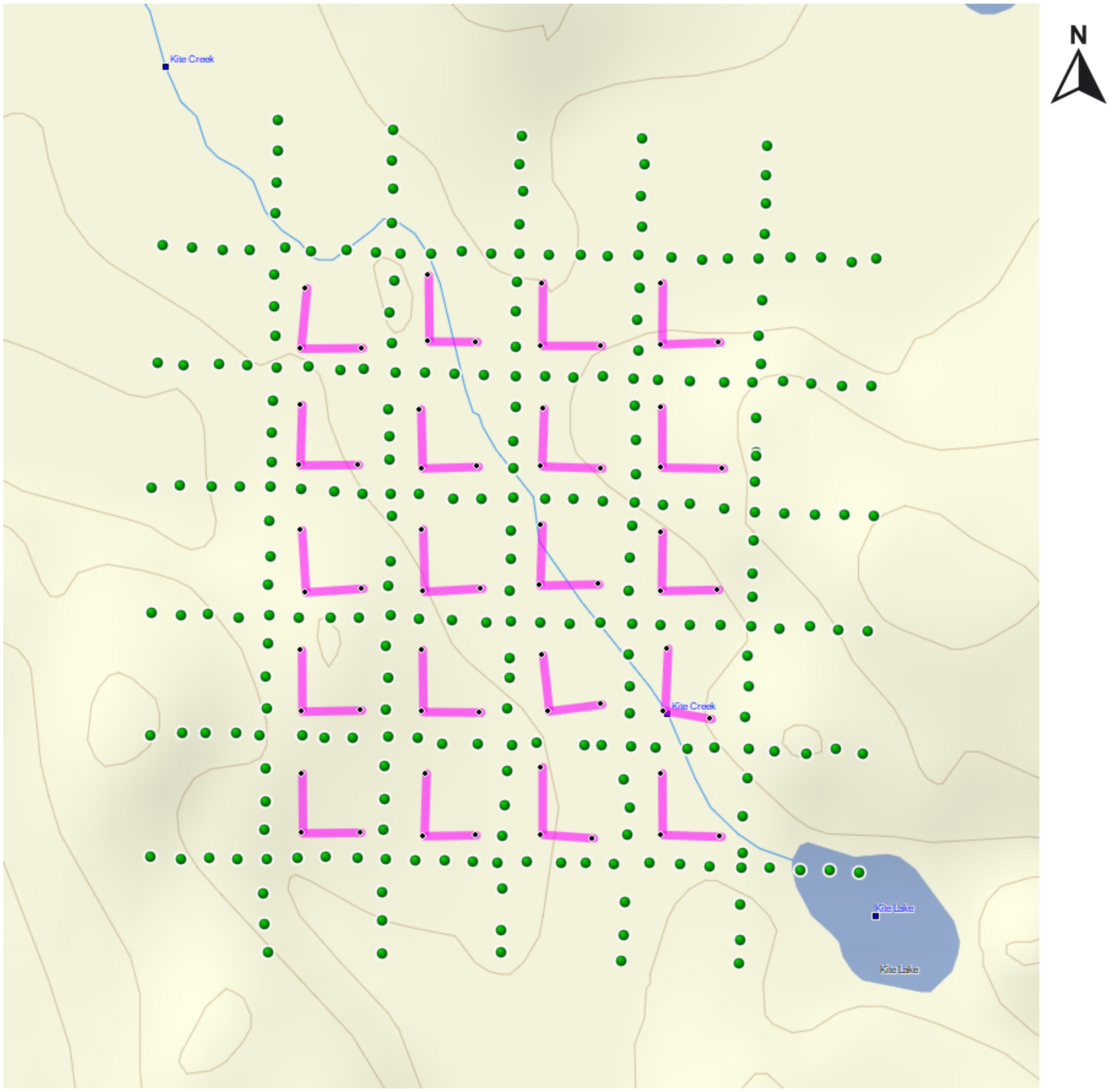

Figure 7: Field Survey Layout with Injection Sites (green dots) in Mapsource

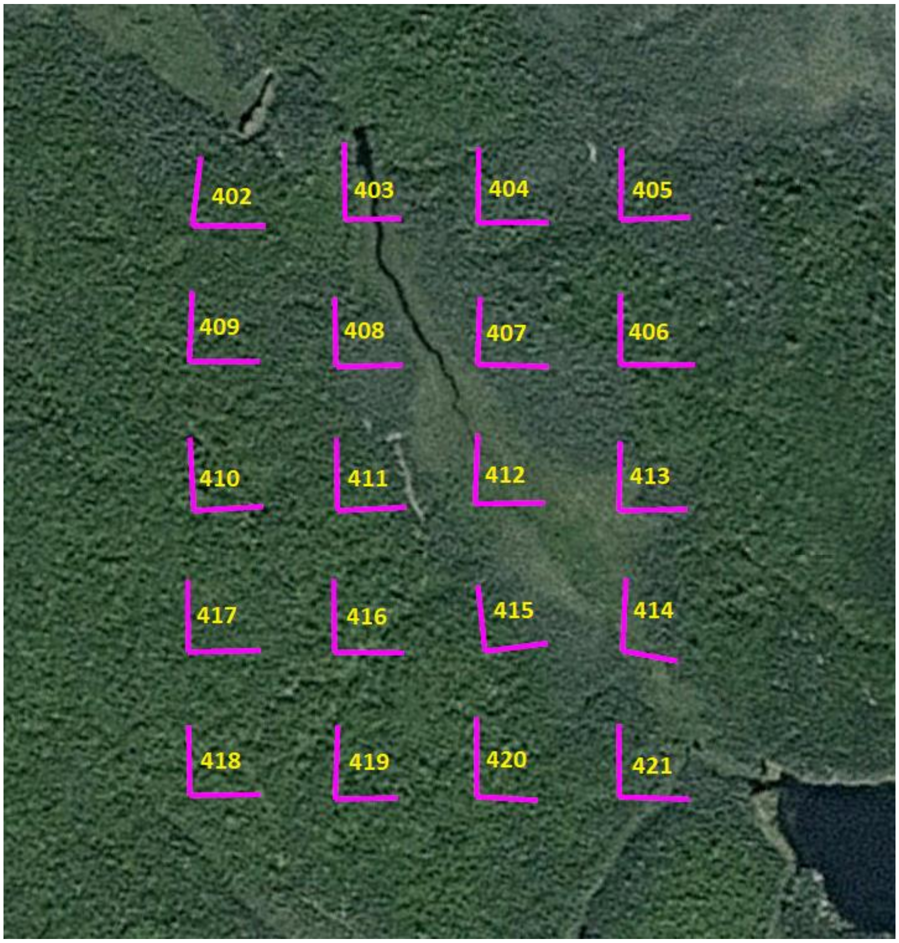

Figure 8: Receiver Dipole Orientations on Google Earth (©2018 Google, Image ©2019 CNES/Airbus)

Figure 9: Topographical Relief with the Survey Deployment Looking Southeast (Image ©2019 CNES/Airbus, ©2018 Google)

4.5 SURVEY LOG

3D IP Survey Log					
Date	**Description**	**Line**	**Min Extent**	**Max Extent**	**Total Survey (m)**
March 12, 2019	Mobilize, locate and move gear to survey area.	-	-	-	-
March 13, 2019	Poor weather with freezing rain. Begin to establish infinite and e-lines.	-	-	-	-
March 14, 2019	Freezing rain and extremely poor conditions. Unable to reach grid. Weather day.	-	-	-	-
March 15, 2019	Freezing rain and extremely poor conditions. Unable to reach grid. Poor conditions forecasted. Demobilize until road is graded. Weather day.	-	-	-	-
March 19, 2019	Re-mobilize to grid and continue setup.	-	-	-	-
March 20, 2019	Complete setup.	-	-	-	-
March 21, 2019	Trouble shoot line and begin survey.	600N	600W	50E	650
		14 injections and 0.65 km			
March 22, 2019	Continue IP survey.	600N	50E	600E	550
		400N	600W	600E	1200
		36 injections and 1.75 km			
March 23, 2019	Continue IP survey.	200N	600W	600E	1200
		0N	600W	600E	1200
		50 injections and 2.4 km			
March 24, 2019	Continue IP survey.	200S	600W	600E	1200
		400S	0	600E	600
		38 injections and 1.8 km			

3D IP Survey Log

Date	Description	Line	Min Extent	Max Extent	Total Survey (m)
March 25, 2019	Continue IP survey.	400S	600W	0	600
		400W	550S	800N	1350
		200W	550S	50S	500
		43 injections and 2.45 km			
March 26, 2019	Continue IP survey.	200W	50S	800N	850
		0E	550S	800N	1350
		200E	550S	100S	450
		43 injections and 2.65 km			
March 27, 2019	Complete the 3D IP survey and begin to recover gear.	200E	100S	800N	900
		400E	550S	800N	1350
		36 injections and 2.25 km			
March 28, 2019	Dismantle setup. End survey. Demobilize.	-	-	-	-
Total	**260 injections and 13.95 km**				

Table 4: 3D IP Survey Log

4.6 PERSONNEL

Crew Member	Position	Resident	Province
Bruce Lavalley	Crew Chief	Britt	Ontario
Claudia Moraga	Transmitter Operator	Britt	Ontario
Neil Jack	Transmitter Operator	Kirkland Lake	Ontario
David Ellerton	IP Technician	Englehart	Ontario
Andrew Johnson	IP Technician	Kirkland Lake	Ontario
Joey Emmell	IP Technician	Englehart	Ontario
David Postman	IP Technician	Niagara	Ontario
Five on Line Contracting	Line Cutters	Belleterre	Quebec
C Jason Ploeger P.Geo.	Senior Geophysicist	Larder Lake	Ontario
Melanie Postman GIT	Junior Geophysicist	Larder Lake	Ontario
Mandy Lim GIT	Junior Geophysicist in training	Saint John’s	NL
Andrew Salerno	Junior Geologist in training	Waterloo	Ontario

Table 5: CXS Induced Polarization Personnel

4.7 FIELD NOTES: CONDITION AND CULTURE

The average weather over the fourteen field days was -2.9°C with highs up to 7°C and lows down to -24°C. There was little precipitation throughout the survey period with an exception to the period between March 13 and March 15, which resulted in two weather days and a decision to demobilize the crew until the road maintenance could be performed.

No culture was noted on the survey area. However, a powerline was located approximately 1.5km west of the survey area and may be a cause for some background noise in the data.

Topographical features and ground characteristics along the read dipoles and current injection lines are noted in the following two tables (Table 6 & 7, respectively).

Logger Field Notes (Soil/Topography/Vegetation/Culture notes on dipoles and corresponding electrodes P1/P2/P3)		
402	**Soil**	P1, P2 and P3 Rocky, sandy
	Topo	P1 to P2 and P2 to P3 Down hill. P2 Flat.
	Veg	P1, P2 and P3 Mixed bush
	Culture	None
403	**Soil**	P1 and P2, Rocky, sandy. P3 Swamp
	Topo	P1 to P2 Flat, creek. P2 Bush line, flat. P2 to P3 Flat
	Veg	P1, P2 Mixed bush. P3 Black spruce
	Culture	None
404	**Soil**	P1, P2, P3 Rocky
	Topo	P2 Top of long outcrop. P2 to P1 Light topo. P2 to P3 Medium topo.
	Veg	P1, P2 and P3 Thick mixed bush
	Culture	None
405	**Soil**	P1, Sandy, rocky. P2 and P3 Rocky
	Topo	P2 flat, bottom of valley. P2 to P1 Up hill. P1 and P3 Side hill. P2 to P3 Light topo.
	Veg	P1, P2 and P3 Thick mixed bush
	Culture	None
406	**Soil**	P1, P2, P3 Rocky
	Topo	P2 to P1 and P2 to P3 Medium topo. P1 and P3 Side hill
	Veg	P1, P2 and P3 Thick mixed bush
	Culture	None

Logger Field Notes (Soil/Topography/Vegetation/Culture notes on dipoles and corresponding electrodes P1/P2/P3)		
407	**Soil**	P1 and P2 Swamp. P3 Sandy, rocky
	Topo	P2 to P1 Flat. P2 to P3 50m flat then steady up hill.
	Veg	P2 to P1 Spruce swamp. P2 to P3 Spruce swamp then mixed bush.
	Culture	None
408	**Soil**	P1 and P3 Sandy, rocky. P2 Swamp
	Topo	P2 to P1 and P2 to P3 Flat
	Veg	P1, P2 and P3 Mixed bush
	Culture	None
409	**Soil**	P1 Sandy, rocky. P2 and P3 Swamp
	Topo	P2 to P1 Flat with some topo. P2 to P3 Flat
	Veg	P2 to P1 Thick mixed bush. P2 to P3 Thick spruce
	Culture	None
410	**Soil**	P1, P2 and P3 Rocky
	Topo	P2 Side hill, bottom of outcrop. P2 to P3 Light topo. P3 Side hill. P2 to P1 Light topo. P1 Side hill
	Veg	P1, P2 and P3 Thick bush
	Culture	None
411	**Soil**	P1 and P2 Rocky. P3 Swamp
	Topo	P3 to P2 Up hill. P2 Top of hill. P2 to P1 Down hill
	Veg	P1, P2 and P3 Mixed bush
	Culture	None
412	**Soil**	P1, P2 and P3 Swamp
	Topo	P2 to P1 and P2 to P3 Level
	Veg	P1, P2 and P3 Open Cedar swamp
	Culture	P2 to P1 and P2 to P3 crosses skidoo trail
413	**Soil**	P1 and P3 Rocky at bottom of outcrop. P2 Swamp
	Topo	P2 to P1 Level. P2 to P3 Light topo.
	Veg	P2 Cedar swamp
	Culture	None

Logger Field Notes
(Soil/Topography/Vegetation/Culture
notes on dipoles and corresponding electrodes P1/P2/P3)

414	**Soil**	P1 and P2 Sandy. P3 Sandy, rocky
	Topo	P1 to P2 Down hill. P2 to P3 Up hill
	Veg	P1, P2 and P3 Mixed bush
	Culture	None
415	**Soil**	P1 and P2 Swamp. P3 Sandy, rocky
	Topo	P1 to P2 Flat. P2 to P3 Up hill
	Veg	P1 and P2 Cedar. P3 Mixed bush
	Culture	None
416	**Soil**	P1 and P2 Soft ground. P3 Rocky
	Topo	P3 is on little hill. P3 to P2 Down hill for 50m. P2 Flat. P2 to P1 Flat.
	Veg	P1, P2 and P3 Mixed bush
	Culture	None
417	**Soil**	P1 and P3 Rocky. P2 Swamp
	Topo	P2 to P3 and P2 to P1 Slight up hill
	Veg	P1, P2 and P3 Mixed bush
	Culture	None
418	**Soil**	P1 and P2 Rocky. P3 Swamp
	Topo	P3 to P2, Up hill for 50m, down hill for 50m. P2 to P1 Up hill
	Veg	P1, P2 and P3 Mixed bush
	Culture	P3 beside trail
419	**Soil**	P1 Swamp. P2 and P3, Rocky, sandy
	Topo	P1 to P2 and P2 to P3 Down hill. P2 Flat.
	Veg	P1, P2 and P3 Mixed bush
	Culture	None
420	**Soil**	P1 and P2 Swamp. P3 Rocky, sandy
	Topo	P2 to P1 Flat. P2 to P3 Up hill
	Veg	P2 to P1 Spruce swamp. P2 to P3 Mixed bush
	Culture	None

Logger Field Notes (Soil/Topography/Vegetation/Culture notes on dipoles and corresponding electrodes P1/P2/P3)		
421	**Soil**	P1, P2 and P3 Swamp
	Topo	P1 to P2 and P2 to P3 Flat
	Veg	P1, P2 and P3 Spruce
	Culture	None
Infi-nite	**Soil**	Muddy, swamp
	Topo	Flat
	Veg	Alder
	Culture	None

Table 6: Logger Electrode & Dipole Field Notes

Date	Line/ Station	UTM X (m)	UTM Y (m)	MSL Z (m)	I (mA)	Injection Field Notes
21 Mar	**L600N**					
	600W	499369	5253961	389	1000	Uphill, rocky, sandy
	550W	499417	5253958	393	1000	Level, rocky, sandy
	500W	499468	5253953	394	600	Level, rocky, mossy
	450W	499513	5253954	395	400	Top of outcrop, very rocky
	400W	499571	5253957	390	1000	Level, swampy, rocky
	350W	499615	5253951	389	1600	Level swamp
	300W	499674	5253953	388	2400	Level swamp
	250W	499723	5253948	399	400	Uphill, rocky
	200W	499763	5253947	397	400	Top of outcrop, rocky
	150W	499815	5253948	391	500	Level, swampy, rocky
	100W	499865	5253950	396	600	Top of hill, rocky
	50W	499915	5253947	400	400	Up and down, rocky, mossy
	0E	499961	5253947	400	400	Up and down, rocky, mossy
	50E	500010	5253945	397	300	Up and down, rocky
22-Mar	**600N**					
	100E	500063	5253945	398	500	Up and down, sandy
	150E	500109	5253943	398	400	Up and down, sandy
	200E	500159	5253945	392	500	Up and down, rocky, sandy
	250E	500215	5253941	391	700	Up and down, rocky, sandy
	300E	500265	5253938	391	1800	Low, level swamp
	350E	500307	5253938	389	1600	Level swamp

Date	Line/ Station	UTM X (m)	UTM Y (m)	MSL Z (m)	I (mA)	Injection Field Notes
	400E	500358	5253938	391	1600	Level swamp
	450E	500412	5253942	390	1700	Level swamp
	500E	500462	5253940	390	1000	Level swamp
	550E	500513	5253933	390	1500	Level swamp
	600E	500553	5253940	389	1500	Level swamp
	400N					
	600E	500545	5253731	398	700	Sidehill, rocky, sandy
	550E	500496	5253732	405	600	Top of hill, rocky, sandy
	500E	500446	5253736	408	600	Up and down, rocky sandy
	450E	500399	5253739	419	400	Top of hill, rocky
	400E	500348	5253738	412	700	Bottom of hill, rocky, swamp
	350E	500301	5253739	413	700	Flat swamp
	300E	500243	5253739	410	500	Flat, rocky swamp
	250E	500191	5253741	406	1400	Downhill, sandy
	200E	500151	5253743	409	400	Up and down, sidehill, rocky, sandy
	150E	500100	5253748	406	500	Up and down, sidehill, rocky
	100E	500051	5253746	398	500	Flat, rocky, sandy
	50E	500005	5253748	398	600	Up and down, sandy
	0E	499955	5253747	398	1100	Level, sandy, wet
	50W	499902	5253749	397	1700	Flat, swamp
	100W	499853	5253752	394	2100	Flat swamp, in creek
	150W	499804	5253753	397	1300	Flat swamp
	200W	499756	5253753	403	500	Top of hill, rocky, sandy
	250W	499703	5253759	401	1500	Level, sandy, rocky
	300W	499664	5253758	401	500	Up and down, rocky, sandy
	350W	499610	5253763	398	1600	Level, sandy
	400W	499557	5253762	397	1200	Uphill, sandy
	450W	499508	5253766	394	700	Level swamp
	500W	499462	5253768	397	600	Bottom of hill, sandy, wet
	550W	499403	5253765	392	1100	Flat swamp
	600W	499360	5253769	397	1600	Flat swamp
23-Mar	**200N**					
	600W	499351	5253565	382	1300	Flat, wet, mossy
	550W	499398	5253570	385	1000	Flat, rocky, mossy
	500W	499449	5253567	396	500	Uphill, rocky, sandy
	450W	499497	5253568	401	900	Flat, rocky, sandy

Date	Line/ Station	UTM X (m)	UTM Y (m)	MSL Z (m)	I (mA)	Injection Field Notes
	400W	499547	5253568	398	900	Flat, sandy
	350W	499598	5253564	396	700	Downhill, rocky
	300W	499653	5253559	399	800	Downhill, rocky, sandy
	250W	499700	5253556	399	1000	Flat, wet, mossy
	200W	499748	5253555	399	700	Downhill, rocky, sandy
	150W	499793	5253556	392	800	Flat, wet, mossy
	100W	499850	5253548	393	1500	Flat, wet, mossy
	50W	499899	5253548	392	1800	Flat, wet, mossy
	0E	499950	5253549	390	1600	Flat, wet, mossy
	50E	500004	5253548	393	1600	Flat swamp
	100E	500051	5253548	394	1700	Flat, wet, mossy
	150E	500099	5253544	394	1200	Flat, wet, mossy
	200E	500153	5253541	395	700	Flat, mossy, sandy
	250E	500199	5253538	405	700	Top of hill, rocky, sandy
	300E	500245	5253540	411	800	Up and down, rocky, sandy
	350E	500302	5253532	418	1000	In valley, sandy, rocky
	400E	500352	5253527	423	900	Flat, sandy
	450E	500402	5253525	425	800	Downhill, rocky, sandy
	500E	500453	5253523	416	500	Uphill, rocky, sandy
	550E	500502	5253522	445	600	Uphill, rocky, sandy
	600E	500551	5253520	450	500	Uphill, rocky, sandy
	L0N					
	600E	500540	5253332	438	900	Steep, downhill, rocky, sandy
	550E	500492	5253335	431	700	Steep, downhill, rocky, sandy
	500E	500445	5253341	421	1100	Downhill, rocky, sandy
	450E	500392	5253337	416	900	Downhill, rocky, sandy
	400E	500347	5253340	409	700	Bottom of hill, flat, mossy, rocky
	350E	500295	5253341	405	1100	Flat, mossy, wet
	300E	500245	5253343	403	1600	Flat, wet, swamp
	250E	500195	5253342	402	1200	Flat, wet, swamp
	200E	500148	5253344	403	1300	Flat, wet, swamp
	150E	500096	5253345	403	1400	Flat, wet, swamp
	100E	500044	5253344	402	1500	Flat, wet, swamp
	50E	499995	5253347	401	1300	Flat, wet, mossy
	0E	499947	5253348	402	800	Uphill, mossy, rocky
	50W	499906	5253346	401	1000	Uphill, rocky
	100W	499848	5253350	404	600	Uphill, rocky
	150W	499794	5253352	410	1200	In valley, rocky

Date	Line/ Station	UTM X (m)	UTM Y (m)	MSL Z (m)	I (mA)	Injection Field Notes
	200W	499747	5253359	416	600	Uphill, rocky, sandy
	250W	499695	5253353	414	600	Small valley, rocky, sandy
	300W	499648	5253355	420	500	Top of hill, rocky, sandy
	350W	499593	5253355	419	500	Uphill, sandy
	400W	499545	5253358	416	700	Valley, mossy
	450W	499495	5253354	414	1200	Valley, mossy
	500W	499444	5253359	420	1000	Uphill, rocky
	550W	499399	5253358	420	1000	Up and down, rocky, sandy
	600W	499350	5253363	419	1200	Flat, wet, mossy
24-Mar	**L200S**					
	600W	499347	5253163	425	600	Downhill, sandy, mossy
	550W	499400	5253166	414	500	Downhill, sandy, mossy
	500W	499440	5253167	420	600	Uphill, sandy, rocky
	450W	499490	5253167	417	600	Downhill, sandy, mossy
	400W	499529	5253163	413	500	Flat, in valley, sandy, rocky
	350W	499601	5253163	408	800	Flat, swamp
	300W	499638	5253158	408	1800	Flat swamp
	250W	499683	5253158	408	1200	Flat, swamp
	200W	499744	5253160	406	500	Downhill, sandy, rocky
	150W	499792	5253159	403	700	Downhill, sandy, rocky
	100W	499833	5253149	400	900	Flat, wet, sandy
	50W	499892	5253149	402	600	Uphill, sandy, rocky
	0E	499948	5253147	401	1000	Flat swamp
	50E	499989	5253150	403	500	Flat, sandy, rocky
	125E	500068	5253147	389	500	Flat, sandy
	150E	500098	5253146	397	1500	Flat, swampy
	200E	500147	5253144	397	1600	Flat swamp
	250E	500187	5253142	396	1600	Flat swamp
	300E	500239	5253140	397	1300	Flat swamp
	350E	500286	5253142	399	140	Flat swamp
	400E	500342	5253141	412	800	Sidehill, rocky, sandy
	450E	500385	5253137	423	700	Sidehill, rocky, sandy
	500E	500438	5253132	424	500	Top of hill, rocky, sandy
	550E	500486	5253140	426	800	Flat, rocky, sandy
	600E	500531	5253132	424	800	Flat, rocky, sandy
	L400S					
	600E	500527	5252940	396	1200	Lake

Date	Line/ Station	UTM X (m)	UTM Y (m)	MSL Z (m)	I (mA)	Injection Field Notes
	550E	500478	5252942	392	800	Lake
	500E	500427	5252942	393	1000	Lake
	450E	500378	5252946	396	1300	Edge of lake
	400E	500330	5252947	402	400	Top of hill, rocky
	350E	500276	5252948	402	600	Downhill, rocky, sandy
	300E	500229	5252954	395	2000	Flat swamp
	250E	500178	5252954	396	1400	Flat swamp
	200E	500118	5252953	404	500	Uphill, sandy
	150E	500071	5252954	403	500	Flat, rocky, sandy
	100E	500030	5252954	401	900	Flat, rocky, sandy
	50E	499972	5252957	407	400	Downhill, rocky, sandy
	0E	499923	5252955	408	400	Uphill, rocky, sandy
25-Mar	**L400S**					
	50W	499883	5252957	422	600	up and down, rocky, sandy
	100W	499837	5252960	418	800	up and down, rocky, sandy
	150W	499788	5252959	416	900	flat, sandy
	200W	499739	5252961	414	800	steep down hill, rocky
	250W	499691	5252962	405	1300	flat, wet, mossy
	300W	499640	5252964	404	1000	downhill, rocky, sandy
	350W	499591	5252962	399	1100	top of outcrop, rocky
	400W	499541	5252961	398	1100	flat, rocky
	450W	499491	5252960	402	800	valley, rocky
	500W	499445	5252963	410	1700	downhill, rocky
	550W	499398	5252961	410	1300	flat, mossy
	600W	499347	5252966	415	700	uphill, rocky
	L400W					
	800N	499560	5254164	389	900	top of hill, rocky, sandy
	750N	499559	5254115	383	1200	flat, rocky, mossy
	700N	499558	5254064	385	1500	flat, swamp
	650N	499556	5254013	385	1600	flat, swamp
	550N	499553	5253912	394	600	top of hill, rocky
	500N	499554	5253861	396	600	flat, rocky, sandy
	450N	499556	5253813	397	600	flat, rocky
	350N	499552	5253707	402	800	flat, mossy
	300N	499549	5253655	406	600	flat, rocky, sandy
	250N	499550	5253607	407	500	flat, rocky, sandy
	150N	499546	5253511	409	1100	flat, rocky, mossy

Date	Line/ Station	UTM X (m)	UTM Y (m)	MSL Z (m)	I (mA)	Injection Field Notes
	100N	499547	5253455	420	600	uphill, rocky, sandy
	50N	499544	5253409	421	600	Sidehill, rocky, sandy
	50S	499543	5253312	418	600	flat, mossy
	100S	499540	5253258	417	1800	flat, swamp
	150S	499541	5253207	424	600	top of hill, sandy
	250S	499540	5253110	422	600	downhill, rocky, sandy
	300S	499539	5253055	417	1100	flat, mossy
	350S	499537	5253008	417	600	downhill, rocky, sandy
	450S	499535	5252905	419	600	top of hill, rocky
	500S	499538	5252856	420	900	valley, wet, mossy
	550S	499543	5252808	428	1100	uphill, rocky, mossy
	L200W					
	550S	499732	5252807	395	1500	flat, wet, mossy
	500S	499733	5252861	395	900	flat, wet, mossy
	450S	499732	5252907	402	700	uphill, sandy
	350S	499734	5253009	408	700	flat, sandy
	300S	499736	5253058	411	500	uphill, sandy
	250S	499737	5253112	408	800	flat, sandy
	150S	499739	5253204	410	500	flat, sandy
	100S	499743	5253257	409	800	up and down, rocky, sandy
	50S	499740	5253309	410	700	flat, sandy
26-Mar	**L200W**					
	50N	499744	5253406	407	1100	flat, swamp
	100N	499746	5253445	405	600	flat, swamp
	175N	499749	5253520	401	500	downhill, rocky, sandy
	250N	499745	5253612	399	400	downhill, rocky, sandy
	300N	499745	5253651	393	1000	flat, swamp
	350N	499743	5253694	392	900	flat, swamp
	450N	499750	5253802	400	500	uphill, rocky, sandy
	500N	499744	5253851	404	600	uphill, rocky, sandy
	550N	499752	5253904	410	400	flat, rocky, sandy
	650N	499750	5253997	385	1000	flat, swamp
	700N	499750	5254054	389	1000	flat, rocky, sandy
	750N	499750	5254100	391	700	uphill, rocky, sandy
	800N	499752	5254149	403	800	flat, rocky
	L0E					

Date	Line/ Station	UTM X (m)	UTM Y (m)	MSL Z (m)	I (mA)	Injection Field Notes
	800N	499966	5254139	403	1200	flat, sandy
	750N	499962	5254093	409	500	flat, rocky, sandy
	700N	499968	5254050	411	400	flat, rocky, sandy
	650N	499961	5253996	413	400	flat, sandy
	550N	499957	5253901	405	1400	downhill, rocky, sandy
	500N	499956	5253853	401	1000	flat, swamp
	450N	499954	5253796	400	700	flat, sandy, rocky
	350N	499955	5253697	398	1200	flat, swamp
	300N	499951	5253641	398	1800	flat, swamp
	250N	499951	5253598	397	1400	flat, swamp
	150N	499947	5253496	397	1600	flat, swamp
	100N	499947	5253450	397	1600	flat, swamp
	50N	499945	5253397	397	2300	flat, swamp
	50S	499945	5253289	397	1400	flat, rocky, sandy
	100S	499944	5253256	398	1200	flat, wet, mossy
	150S	499941	5253206	406	800	uphill, rocky, sandy
	250S	499941	5253105	406	600	uphill, rocky, sandy
	300S	499936	5253049	405	900	flat, rocky, sandy
	350S	499933	5252999	404	1100	flat, rocky, sandy
	450S	499932	5252912	405	700	flat, rocky, sandy
	500S	499930	5252846	400	700	downhill, rocky, sandy
	550S	499930	5252810	397	600	flat, rocky, sandy
	L200E					
	550S	500131	5252795	384	2200	flat, swamp
	500S	500134	5252838	388	900	Sidehill, rocky, sandy
	450S	500137	5252891	388	1000	flat, rocky, sandy
	350S	500140	5253000	397	500	flat, rocky, sandy
	300S	500144	5253045	396	600	flat, rocky, sandy
	250S	500135	5253091	390	1600	flat, swamp
	150S	500144	5253198	389	1900	flat, swamp
	100S	500144	5253243	389	1800	flat, swamp
27-Mar	**L200E**					
	50S	500143	5253295	393	1100	flat, swamp
	50N	500142	5253398	393	1000	flat, swamp
	100N	500145	5253451	393	1500	flat, swamp
	150N	500148	5253504	394	800	flat, swamp
	250N	500154	5253588	407	400	uphill, rocky, sandy

Date	Line/ Station	UTM X (m)	UTM Y (m)	MSL Z (m)	I (mA)	Injection Field Notes
	300N	500155	5253645	412	400	uphill, rocky, sandy
	350N	500152	5253699	415	600	flat, rocky, sandy
	450N	500158	5253790	402	1200	flat, swamp
	500N	500157	5253838	407	500	flat, rocky, sandy
	550N	500160	5253891	403	500	downhill, rocky, sandy
	650N	500166	5253991	397	2100	flat, swamp
	700N	500163	5254041	397	1300	flat, swamp
	750N	500169	5254093	398	1700	flat, swamp
	800N	500165	5254136	398	1700	flat, swamp
	L400E					
	800N	500372	5254123	398	900	uphill, sandy
	750N	500371	5254075	397	1800	flat, swamp
	700N	500371	5254030	397	1300	flat, swamp
	650N	500368	5253980	399	1400	flat, swamp
	550N	500364	5253872	400	500	uphill, rocky, sandy
	500N	500359	5253814	411	400	flat, rocky
	450N	500362	5253768	415	700	uphill, rocky, sandy
	350N	500355	5253680	418	500	flat, rocky
	300N	500355	5253617	416	600	flat, rocky
	250N	500353	5253577	419	400	flat, rocky
	150N	500350	5253480	420	700	downhill, rocky, sandy
	100N	500348	5253426	417	700	flat, rocky, sandy
	50N	500348	5253388	413	500	flat, rocky, sandy
	50S	500339	5253292	402	500	flat, rocky, sandy
	100S	500342	5253242	409	500	uphill, rocky, sandy
	150S	500336	5253192	414	600	uphill, rocky, sandy
	250S	500340	5253092	398	1500	flat, swamp
	300S	500333	5253031	397	1500	flat, swamp
	375S	500332	5252970	398	1200	uphill, rocky, sandy
	450S	500328	5252887	407	600	Sidehill, rocky, sandy
	500S	500329	5252829	401	600	flat, rocky
	550S	500325	5252791	400	700	downhill, rocky, sandy

Table 7: Current Injection Field Notes

4.8 SAFETY

Canadian Exploration Services Ltd prides itself in creating and maintaining a safe work environment for its employees. Each crew member is briefed on the jobsite location, equipment safety, standard operating procedures along with our health and safety manual. An emergency response plan is generated relating to the specific job and with the jobsite predominantly in the field, which is unpredictable, morning safety briefings are essential. Topics are generally chosen based off jobsite characteristics of the area, weather conditions, timing and crew experience. All possible topics discussed during a survey, dependent on field conditions and time of the year, are listed in the following table.

Safety Topic	Protocol
Active Work Site	Be aware of surrounding activities – drilling, mine monitoring, and traffic. Caution when working near roads, and post safety signs to alert passers-by of ongoing geophysical surveys.
ATV	Conduct circle check before operating an ATV. Ensure brakes and tires are in good working condition. Drive at reasonable speeds according to terrain to avoid accidents. The use of helmets is mandatory.
Extreme Temperatures	With temperatures down to -40, there is an increased risk of cold related injuries (i.e. frostbite, hypothermia). Dress accordingly and take breaks to warm up if necessary. Bring extra clothing to anticipate for possible drop in temperature throughout the day. With temperatures up to +30C, there is an increased risk of heat stroke. Keep hydrated throughout the day and in shaded areas if possible.
Communication	Check in with the crew leader or any crew member when working individually to inform the team of your safety and well-being.
Heavy Lifting	When lifting equipment individually, always lift with your legs rather than your back. Always ask fellow crew members for help when lifting or moving heavy and large equipment (i.e. transmitter, generator, snowmobile, etc.).
Hunting Seasons	There may be more traffic during hunting season. Be careful when crossing. Wear proper (high-visibility) attire to avoid being mistaken for an animal in the bush.
Power Protocol	When in doubt, always assume that power is on and stay clear of survey circuits until confirmed otherwise.
Power Tools	Be alert when operating power tools – chainsaw, Tanaka, etc. Do not operate equipment when unsure of safety instructions for the specific tool.

Safety Topic	Protocol
Rain	Terrains may be slippery. Traverse carefully to avoid slipping, especially when ascending, descending, or walking along side of hills. When there is a chance of thunderstorm, notify person in-charge of transmitter when thunder is heard. Be extra careful with power protocol due to increased risk of shock. Bring extra clothing in case gear gets too wet and heavy.
Road and Trail Crossing	The public may not be aware of the dangers of geophysical work programs. Remember to flag wires around trails and roads. These should also be well marked with appropriate danger signs.
Sharp Tools	Be careful when handling tools such as a machete and knives to avoid injuries. Inform another crew member of any injuries.
Slips, Trips and Falls	Increased risk of hidden hazards with snow coverage. Proper use of snow shoes is encouraged to avoid injuries from slipping, tripping, or falling. 3 points of contact is encouraged.
Snowmobile	Proper use of PPE (i.e. safety helmet, high visibility attire, etc.). Practice safety checks before operating snowmobiles. Ensure that engines and brakes are in good working condition. Ensure that oil, coolant, and gasoline levels are sufficient for distance of travel. Check that snowmobile is physically safe to operate (i.e. no broken parts).
Truck and Trailer	Conduct safety checks prior to operation of company trucks to ensure engines, brakes, tires, and etc. are in good working condition prior to operating vehicle. Conduct circuit checks when mobilizing and de-mobilizing trailers.
Water Hazards	Creeks, lakes, and swamps may not be fully frozen even under very low temperatures. The use of a stick or pole is encouraged for testing water bodies prior to crossing.
Wildlife	Always be aware of surroundings, keeping an eye out for animals such as bears, moose and wolves. Carry bear spray when in the field during the summer.
Winter Driving	Snow accumulation, freezing rain and icy conditions create added road hazards. Road into field sites may be rough. Drive at appropriate speeds according to road conditions.

Table 8: General Safety Topic Protocols

Emphasized daily topics discussed in the field for this project include:

Date	Safety Topic
March 12, 2019	Mobilization. Truck and trailers circle check. Snowmobile circle check. Drive according to road conditions. Driving on Secondary road with logging trucks, switch to channel 144 on the radio to communicate.
March 13, 2019	Weather / Freezing rain, snow, rain. Dress according. Snowmobile trail conditions will not be good, be prepared and ask for help if snowmobile is stuck.
March 14, 2019	Weather day. Extremely slippery in parking lot.
March 15, 2019	Weather day. Extremely slippery. Driving icy roads.
March 19, 2019	Mobilization. Truck and trailers circle check. Snowmobile circle check. Drive according to road conditions. Driving on Secondary road with logging trucks, switch to channel 144 on the radio to communicate.
March 20, 2019	Slips, trips and falls. Steep topography in area which is icy which increases risk.
March 21, 2019	Power protocol. Always assume Power is ON. Clear in the "Front/back".
March 22, 2019	Truck circle checks. Icy roads, drive according to conditions.
March 23, 2019	Snow is melting, pungees are showing up on the line. These get stuck in snowshoes and are tripping hazards.
March 24, 2019	Weekly Review
March 25, 2019	Snowmobile circle check. Rough melting trail, drive according to conditions.
March 26, 2019	Flag wire crossing trails and mark with high voltage signs. Heavy lifting, ask for help.
March 27, 2019	Power protocol. Clear in "Front/back". Always assume Power is ON. Do not clip/unclip while transmitting.
March 28, 2019	Review, and demobilization checks.

Table 9: Daily Field Safety Topics

5. INSTRUMENTATION & METHODS

5.1 INSTRUMENTATION[1]

Twenty 2-channel Full Waver IP receivers were employed for the 3D IP survey. The transmitter consisted of a GDDII (5kW) with a Honda 6500 as a power plant. Two current monitors were connected to the transmitter to record the current transmitted; one to record each 90s transmit and the second to continuously record throughout the day, as a backup.

Time-domain IP surveys involve measurement of the magnitude of the polarization voltage that results from the injection of pulsed current into the ground. Apparent resistivity and chargeability are the parameters of interest measured through this procedure.

5.2 THEORETICAL BASIS

Time domain IP (TD-IP) surveys involve measurement of the magnitude of the polarization voltage that results from the injection of pulsed current into the ground.

Two main mechanisms are known to be responsible for the IP effect although the exact causes are still poorly understood. The main mechanism in rocks containing metallic conductors is electrode polarization (overvoltage effect). This results from the buildup of charge on either side of conductive grains within the rock matrix as they block the flow of current. Upon removal of this current the ions responsible for the charge slowly diffuse back into the electrolyte (groundwater) and the potential difference across each grain slowly decays to zero.

The second mechanism, membrane polarization, results from a constriction of the flow of ions around narrow pore channels. It may also result from the excessive build up of positive ions around clay particles. This cloud of positive ions similarly blocks the passage of negative ions through pore spaces within the rock. Upon removal of the applied voltage the concentration of ions slowly returns to its original state resulting in the observed IP response.

In TD-IP, the current is usually applied in the form of a square waveform, with the polarization voltage being measured over a series of short time intervals after each current cut-off, following a short delay of approximately 0.5s. These readings are integrated to give the area under the decay curve. The integral voltage is divided by the observed steady voltage (the voltage due to the applied current, plus the polarization voltage) to give the apparent chargeability (Ma) measured in milliseconds. For a given charging period and integration time the measured apparent chargeability provides qualitative information on the subsurface geology.

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[1] Refer to appendix B for instrument specifications.

The polarization voltage is measured using a pair of non-polarizing electrodes like those used in spontaneous potential measurements and other IP techniques.

5.3 SURVEY SPECIFICATIONS

3D Distributed Induced Polarization Array

The 3D Distributed Induced Polarization array configuration was used for this survey. This array consisted of 60 mobile stainless steel read electrodes and two current electrodes. 20 portable receivers were each connected to 3 read electrodes (P1, P2, and P3) to create 2 orthogonal components with 100m dipole spacings. The power location CA was chosen based on field conditions but placed throughout the survey area (randomly or in a grid-like manner). In this case, there were 5 north-south, spaced at 200m intervals and 6 east-west lines, spaced at 200m, used for power locations. Along each line the power transmits were injected at approximately every 50m. The infinite was located approximately 4.9 kilometers south-southeast of the center of the survey grid at 501392E and 5248782N. The infinite was placed as far as possible to achieve a pole-dipole array. The maximum theoretical depth obtained was approximately 450 metres. An 8 second transmit cycle time, with a 2 second energizing time was used for a duration of 90 seconds for approximately 12 stacks.

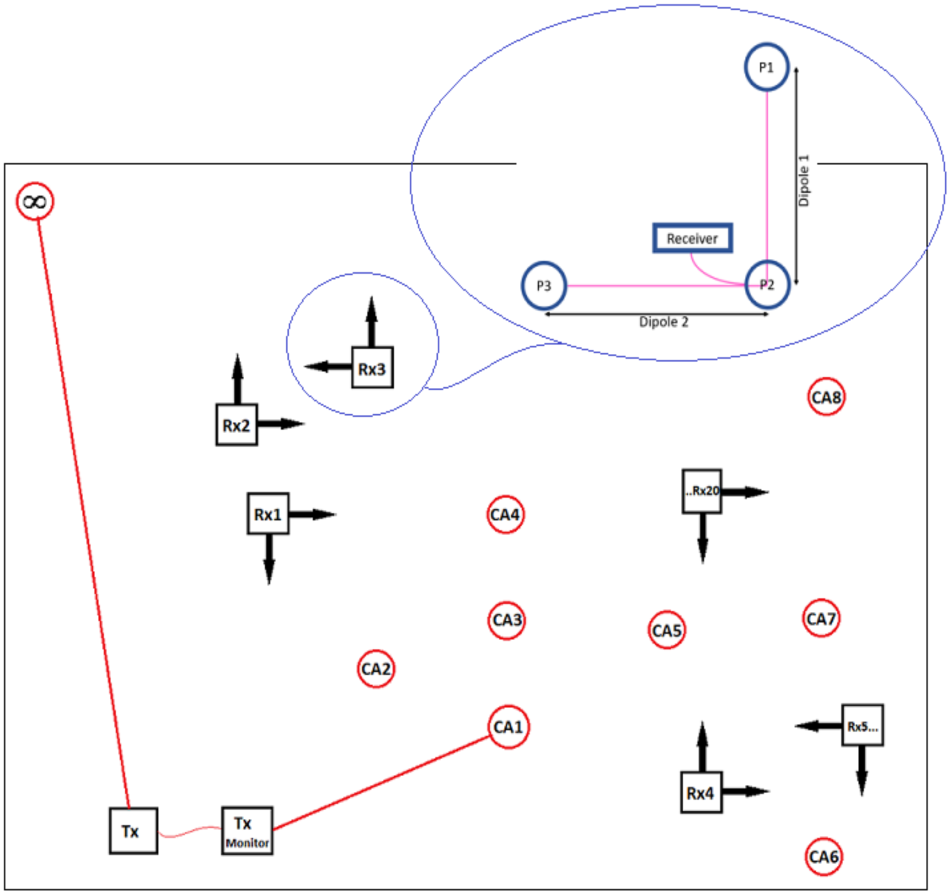


Figure 10: 3D Distributed IP Configuration

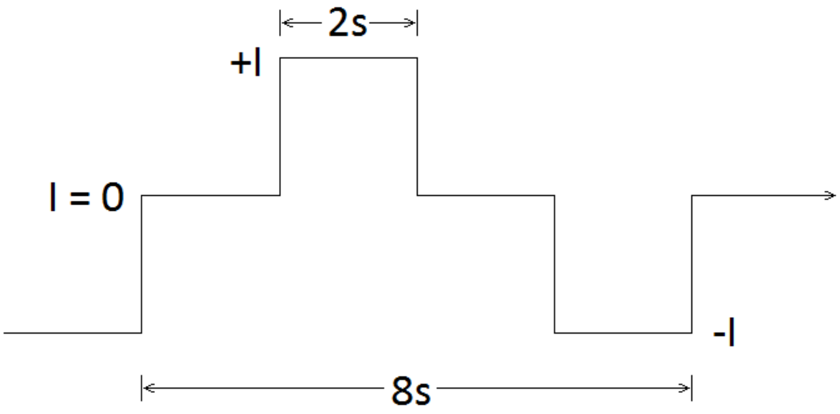


Figure 11: Transmit Cycle Used

6. QUALITY CONTROL & PROCESSING

6.1 FIELD QUALITY CONTROL

Daily field quality control steps consisted of the following:

1. Resistivity checks – the resistivity of each dipole was recorded in the field pre- and post-acquisition to ensure dipoles were connected to the receiver properly and the electrode was well contacted with the ground.

2. GPS checks – internal GPS of each receiver was checked that they were placed in the proper position. GPS and injection file time stamps were compared to confirm correlation.

3. Data check – data was dumped daily and confirmed that the number of GPS points matched the number of injection files.

4. Backup – a second current monitor recorded the transmit cycles continuously throughout every acquisition day. If necessary, the backup was used.

5. Repeats – repeats of lines/data were taken if necessary.

6.2 PROCESSING

In the office, processing of the data and quality control was done interchangeably. The steps included:

1. Import positions – GPS coordinates were imported into each corresponding current injection file (IAB) and receiver file (VMN) using the Fullwave Viewer Software.

2. GPS check – the imported positions were confirmed on Google Earth.

3. Synchronization check – in case of GPS lags or different time settings the synchronization of the files was checked to determine they match (Figure 12).

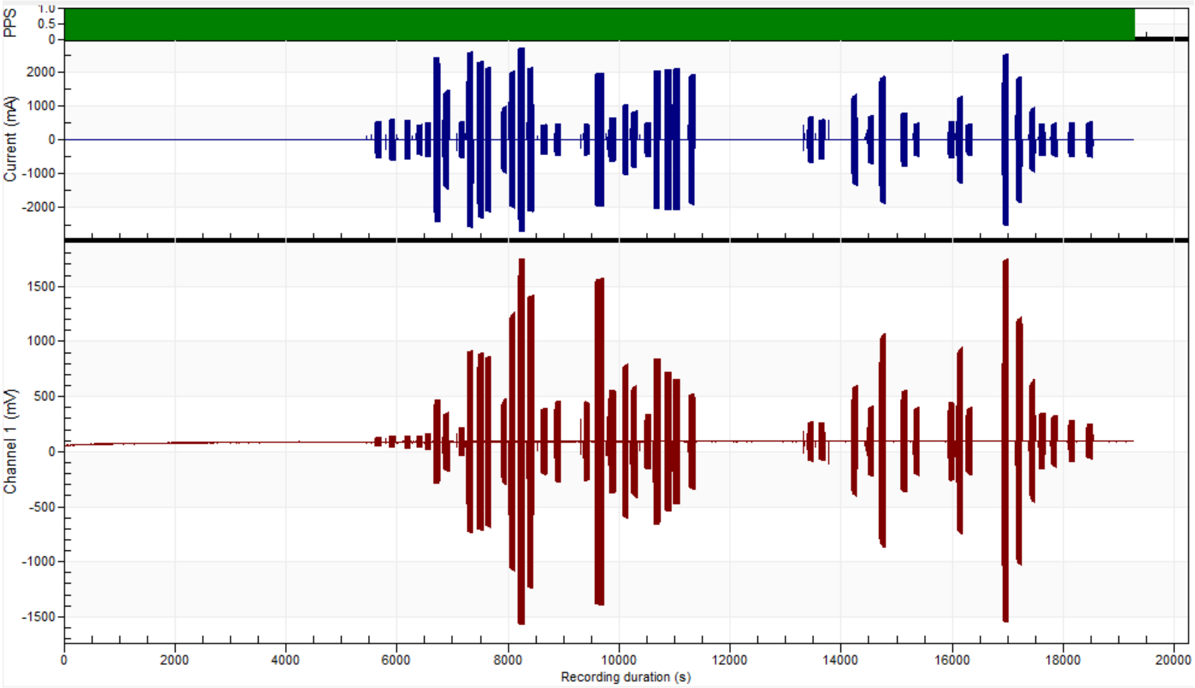
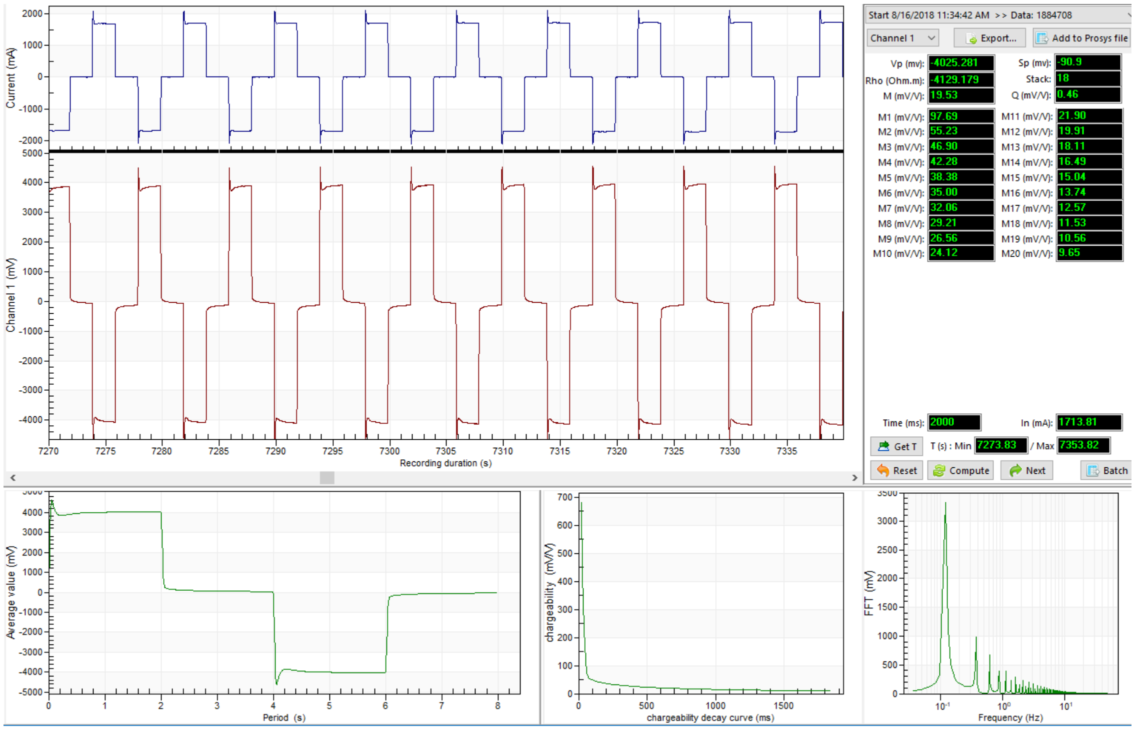


Figure 12: Receiver recordings (red) synchronized with the current injections (blue)

4. Prosys output – a complete .bin file was output from the Fullwave Viewer software.

5. Data quality control – values were viewed in the complete .bin file. Accepted values with a normal M1-M20 range would have a proper transmit cycle, a smooth curve, and a high amplitude low frequency narrow peak (Figure 13). Unaccepted values with an abnormal M1-M20 range (Figure 14, red circle) would not have proper signals (Figure 15). These abnormal values could be due to a few different things or a combination of the following; the dipole being too far from the current injected, the background noise being greater than that of the current injected, poor dipole coupling, and/or cultural features on surface causing coupling or a significant background noise interference. These were removed in the following step.



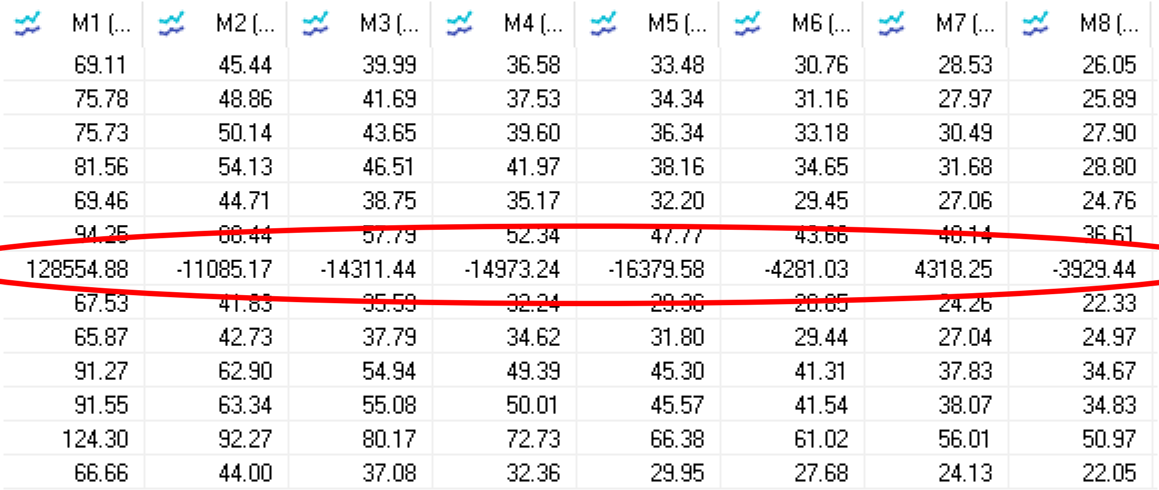
Start 8/16/2018 11:34:42 AM >> Data: 1884708

Vp (mv): -4025.281
Rho (Ohm.m): -4129.179
M (mV/V): 19.53
Sp (mv): -90.9
Stack: 18
Q (mV/V): 0.46

M1 (mV/V): 97.69
M2 (mV/V): 55.23
M3 (mV/V): 46.90
M4 (mV/V): 42.28
M5 (mV/V): 38.38
M6 (mV/V): 35.00
M7 (mV/V): 32.06
M8 (mV/V): 29.21
M9 (mV/V): 26.56
M10 (mV/V): 24.12
M11 (mV/V): 21.90
M12 (mV/V): 19.91
M13 (mV/V): 18.11
M14 (mV/V): 16.49
M15 (mV/V): 15.04
M16 (mV/V): 13.74
M17 (mV/V): 12.57
M18 (mV/V): 11.53
M19 (mV/V): 10.56
M20 (mV/V): 9.65

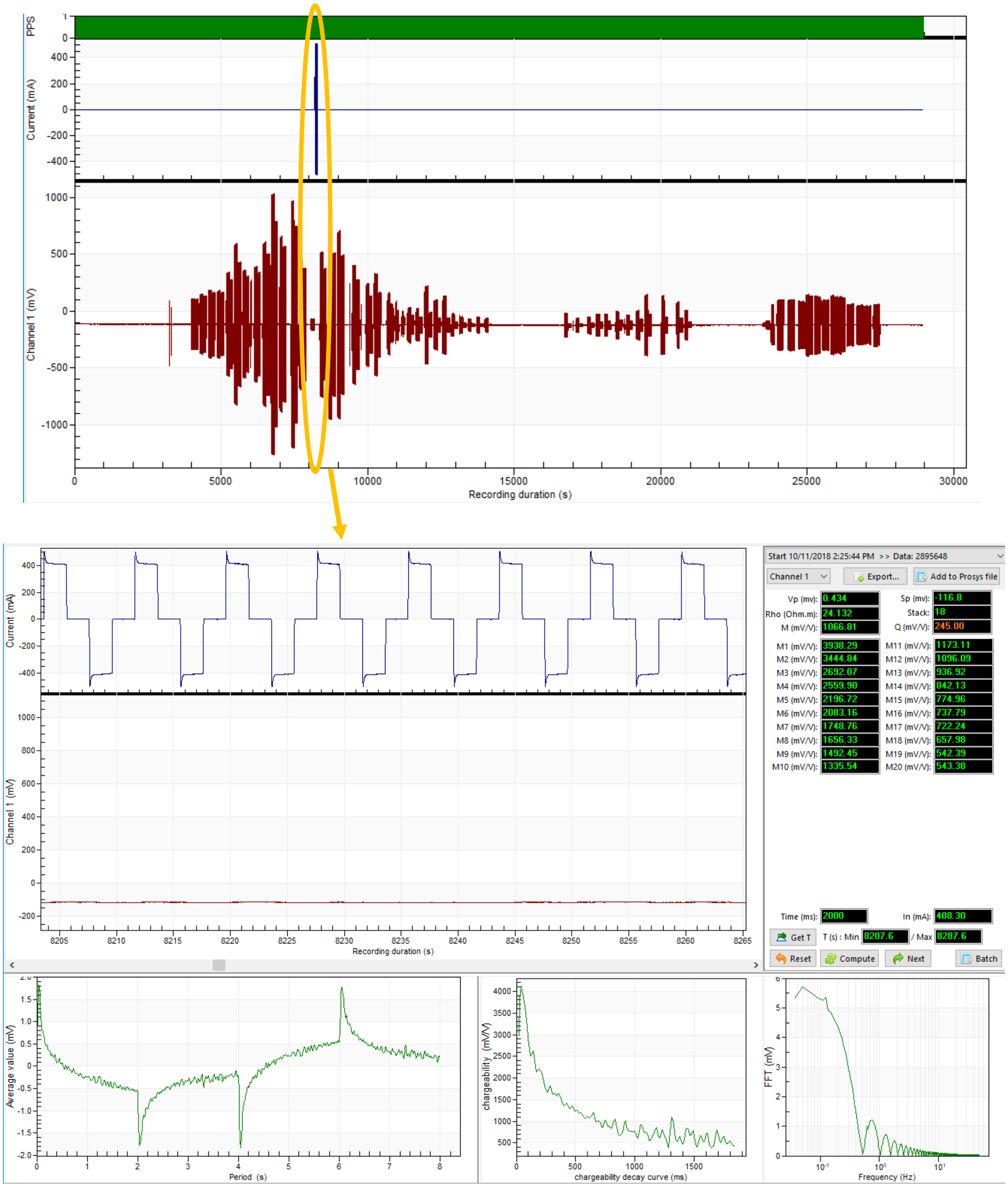
Time (ms): 2000
In (mA): 1713.81
T (s) : Min 7273.83 / Max 7353.82

Figure 13: Good 90 second transmit/read pair. Injection (blue), read signal (red), transmit signal (bottom left), decay curve (bottom centre), FFT (bottom right).



M1 (...	M2 (...	M3 (...	M4 (...	M5 (...	M6 (...	M7 (...	M8 (...
69.11	45.44	39.99	36.58	33.48	30.76	28.53	26.05
75.78	48.86	41.69	37.53	34.34	31.16	27.97	25.89
75.73	50.14	43.65	39.60	36.34	33.18	30.49	27.90
81.56	54.13	46.51	41.97	38.16	34.65	31.68	28.80
69.46	44.71	38.75	35.17	32.20	29.45	27.06	24.76
94.25	66.44	57.79	52.34	47.77	43.66	40.14	36.61
128554.88	-11085.17	-14311.44	-14973.24	-16379.58	-4281.03	4318.25	-3929.44
67.53	41.83	35.59	32.24	29.36	26.85	24.26	22.33
65.87	42.73	37.79	34.62	31.80	29.44	27.04	24.97
91.27	62.90	54.94	49.39	45.30	41.31	37.83	34.67
91.55	63.34	55.08	50.01	45.57	41.54	38.07	34.83
124.30	92.27	80.17	72.73	66.38	61.02	56.01	50.97
66.66	44.00	37.08	32.36	29.95	27.68	24.13	22.05

Figure 14: Output .bin file viewed in Prosys. Larger abnormal M values circled in red.



Start 10/11/2018 2:25:44 PM >> Data: 2895648

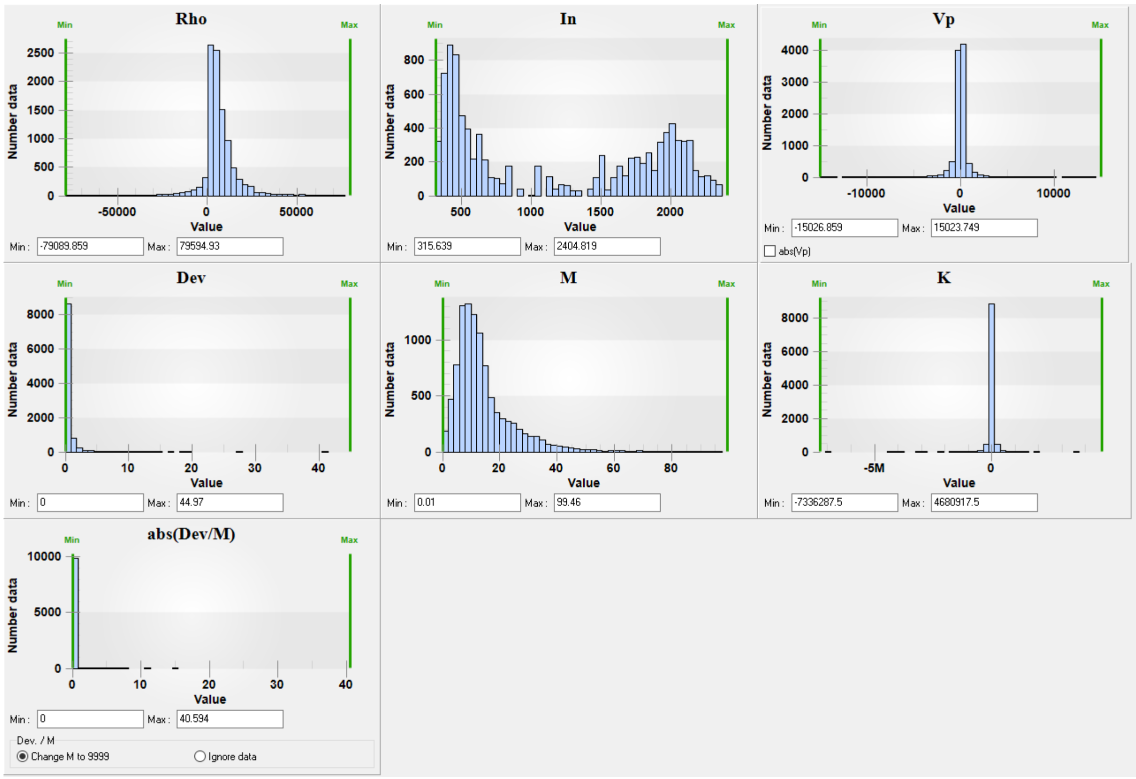
Vp (mv): 0.434
Rho (Ohm.m): 24.132
M (mV/V): 1066.81
Sp (mv): -116.8
Stack: 18
Q (mV/V): 245.00

M1 (mV/V): 3938.29
M2 (mV/V): 3444.84
M3 (mV/V): 2692.07
M4 (mV/V): 2559.90
M5 (mV/V): 2196.72
M6 (mV/V): 2083.16
M7 (mV/V): 1748.76
M8 (mV/V): 1656.33
M9 (mV/V): 1492.45
M10 (mV/V): 1335.54
M11 (mV/V): 1173.11
M12 (mV/V): 1096.09
M13 (mV/V): 936.92
M14 (mV/V): 842.13
M15 (mV/V): 774.96
M16 (mV/V): 737.79
M17 (mV/V): 722.24
M18 (mV/V): 657.98
M19 (mV/V): 542.39
M20 (mV/V): 543.38

Time (ms): 2000
In (mA): 408.30
T (s) : Min 8207.6 / Max 8287.6

Figure 15: Signal, cycle, and curves of abnormal unaccepted M values.

6. Filtering – Values with unrealistic resistivities and chargeabilities, high standard deviations, large geometric factors, and that are oversaturated were filtered out (Figure 16).



Rho – Min : -79089.859 Max : 79594.93

In – Min : 315.639 Max : 2404.819

Vp – Min : -15026.859 Max : 15023.749

☐ abs(Vp)

Dev – Min : 0 Max : 44.97

M – Min : 0.01 Max : 99.46

K – Min : -7336287.5 Max : 4680917.5

abs(Dev/M) – Min : 0 Max : 40.594

Dev. / M

● Change M to 9999 ○ Ignore data

Figure 16: Filtering options

3D viewing of the raw calculated chargeability and resistivity results was observed in Geosoft Oasis (Figures 17-19; Y=North). Calculated report points from acquisition were recorded at a maximum depth of approximately 700 metres depth.

A total of 9684 filtered data points was collected from this 3D IP survey configuration over a period of 7 days.

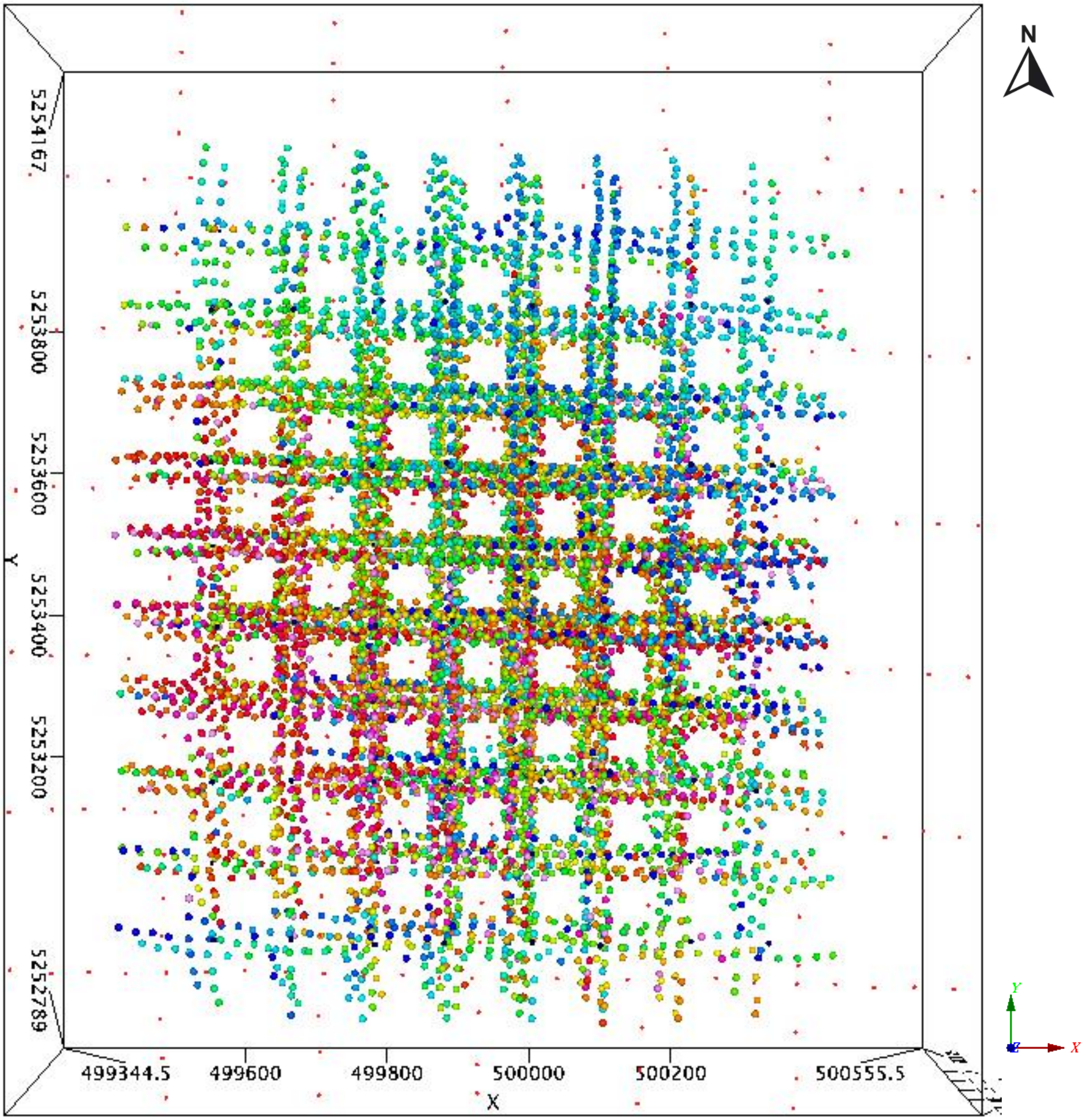


Figure 17: Measured chargeability data points.

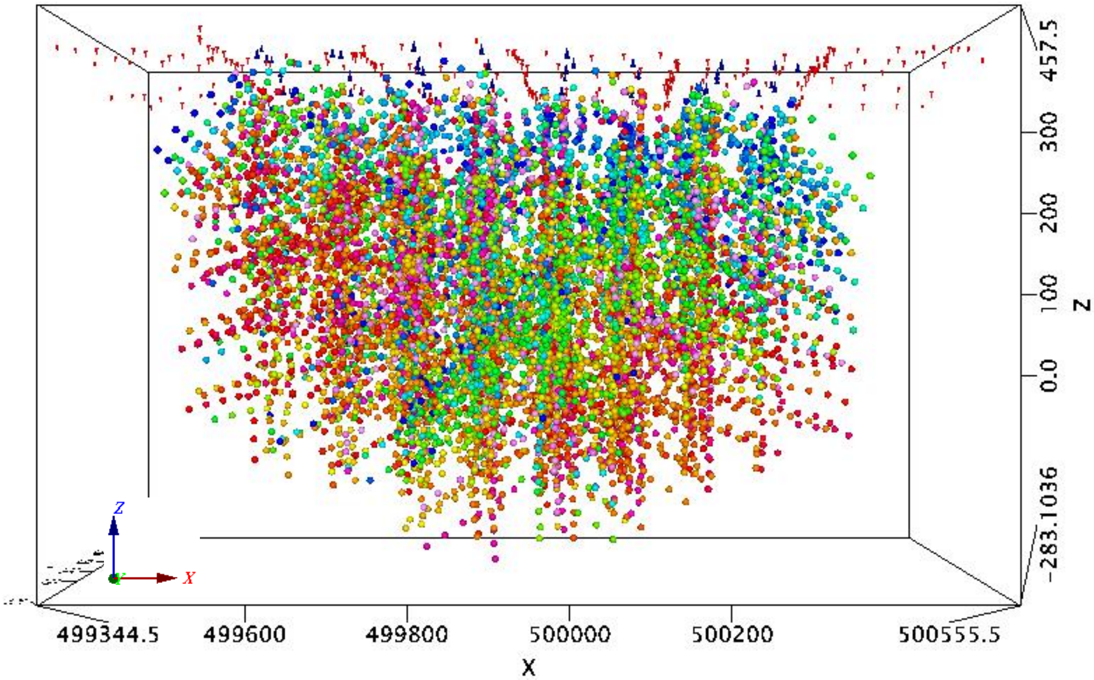


Figure 18: Side view of the complete measured chargeability dataset facing north with the survey layout on top

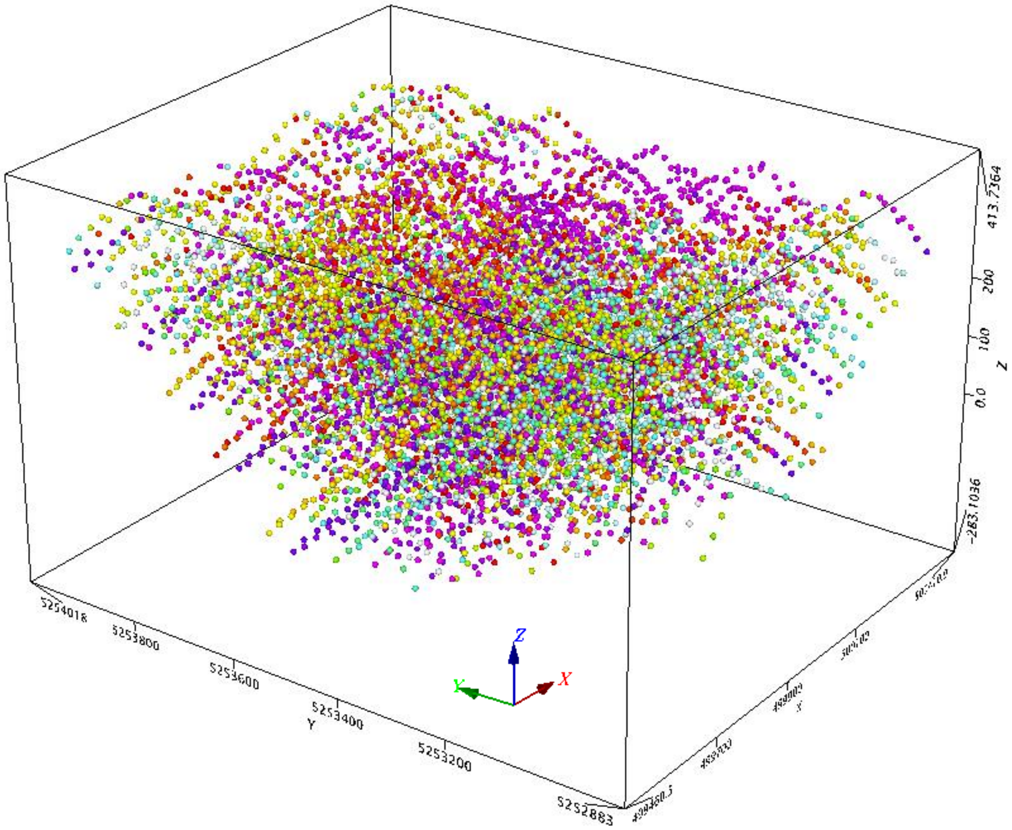
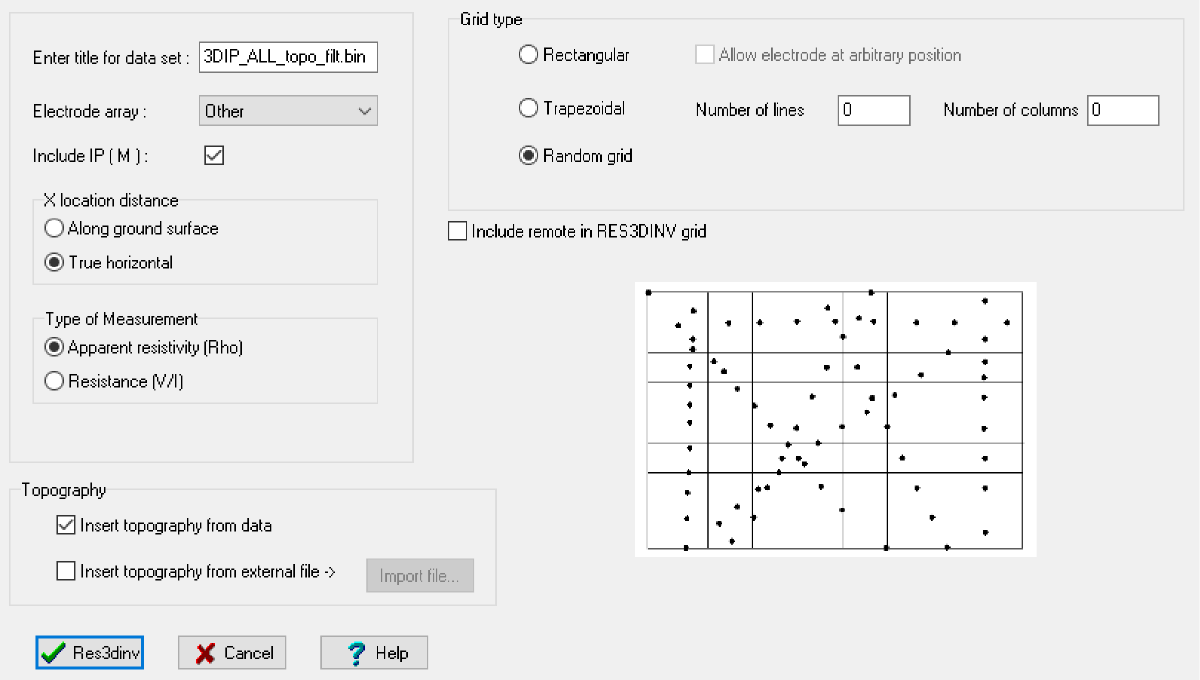


Figure 19: Angled view of the complete set of resistivity data points

6.3 INVERSION

Inversions of the filtered data was done in RES3DINV Professional version 3.14.19. RES3DINV is a 3D inversion software specifically used for resistivity and induced polarization data. From the finalized Prosys file an export to a RES3DINV format was created with specific selections depending on the survey type completed. The selections seen in Figure 20 are standard 3D distributed IP array settings. Depending on the intended survey array type, including the remote may or may not be used. For example, in this case there was a single remote electrode placed as far from the survey grid as possible to achieve a pole-dipole array scenario, thus it was not necessary to include the remote. Topography was included.



Enter title for data set : 3DIP_ALL_topo_filt.bin

Electrode array : Other

Include IP (M) : ☑

X location distance
○ Along ground surface
● True horizontal

Type of Measurement
● Apparent resistivity (Rho)
○ Resistance (V/I)

Grid type
○ Rectangular
☐ Allow electrode at arbitrary position
○ Trapezoidal
Number of lines 0
Number of columns 0
● Random grid

☐ Include remote in RES3DINV grid

Topography
☑ Insert topography from data
☐ Insert topography from external file ->

Figure 20: Export settings selection from Prosys to RES3DINV

Model grid settings were chosen based on the infinite locations and the dipole lengths. A ¼ or 1/5 of the dipole length, in this survey case a uniform cell size was chosen to be cell size of 25m was used (Figure 21). To reduce edge artifacts a few cells extension was added. Manual edits to the cell uniformity may be necessary depending on the location of the infinite. In this case manual edits were not made. Eleven model layers were used with depths to 15, 30, 50, 75, 100, 130, 165, 205, 250, 300, and 360 metres.

The theoretical maximum depth obtained from the Fullwave Designer was 450 metres. Calculated report points from acquisition were recorded at a maximum depth of approximately 700 metres depth. However, a maximum depth of 360 metres was used because resolution and sensitivity decrease as depth increases. Sensitivity values represent how well the model is constrained, with higher sensitivities providing less uncertainty and greater validity.

Important inversion parameters used for the creation of the model are described in Table 9[2].

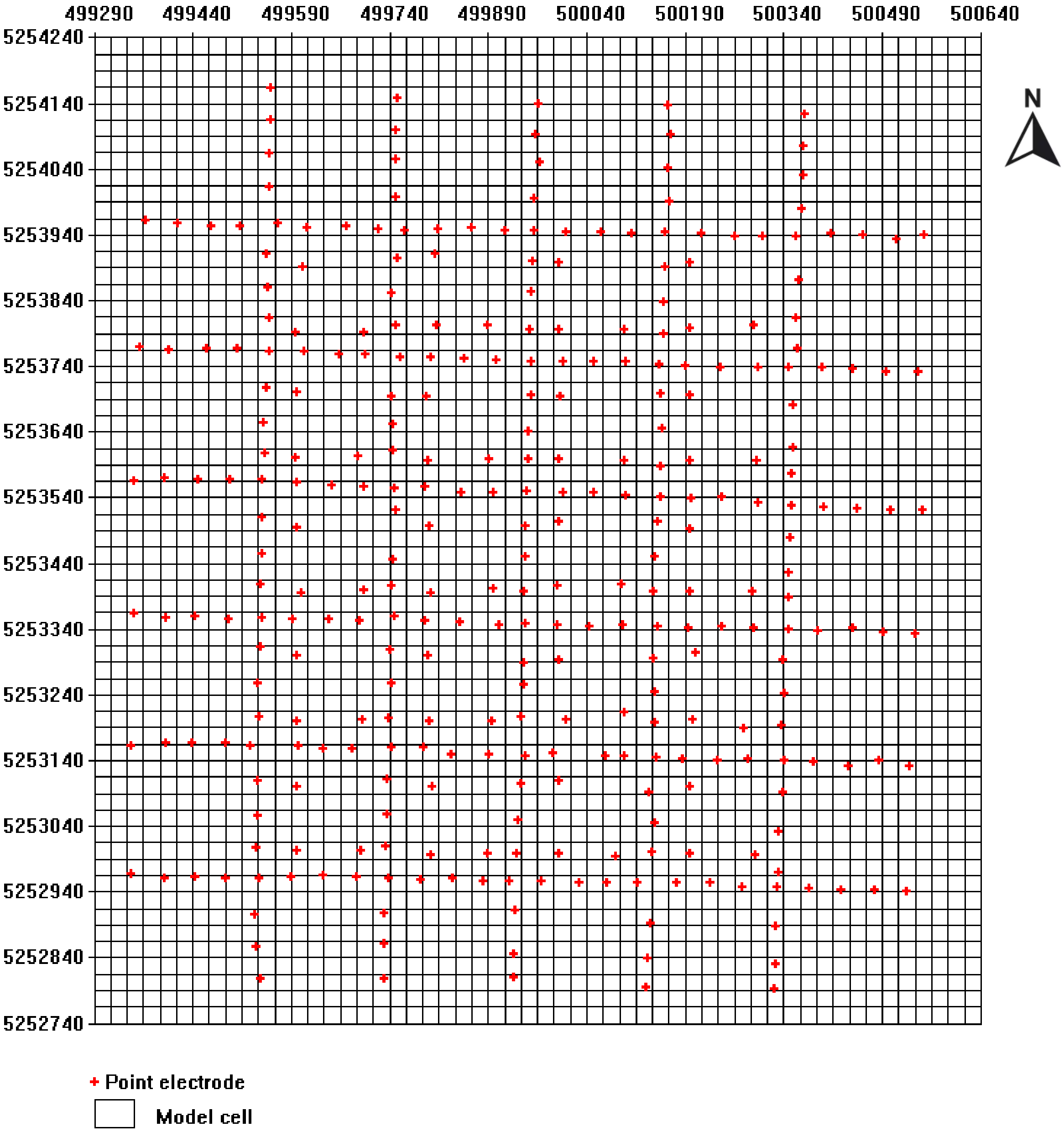


Figure 21: 25m model cell size – model viewer in RES3DINV

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[2] Refer to the RES3DINV manual and tutorial by Dr. M.H. Loke.

Parameter	Description
Refined Topography	Estimates topography of each interior node individually to take non-linear topography variations within each model block into account.
Higher Damping of 1st layer	Useful to avoid unusually large resistivity variations in the top layer (Loke and Dahlin 2010).
Diagonal Filter Components	Reduces effects of produced structures with boundaries aligned along the horizontal and vertical directions.
Robust Data Constraint	Attempts to minimize the absolute difference between the measured and calculated apparent resistivity values (Claerbout and Muir 1971). Less sensitive to very noisy data point.
Robust Model Constraint	Produces models with regions of more uniform resistivity values with sharper boundaries.
Incomplete Gauss-Newton	An approximate solution of the least-squares equation that uses an iterative linear conjugate-gradient method.
Reference Model	An additional constraint on the model to limit the deviation of the model resistivity from a homogenous reference model. This is normally the average of the apparent resistivity values.
Logarithm of Apparent Resistivity	In 2D systems it is ~impossible to determine whether the measured potential has the same sign as the transmitted current, thus it was assumed apparent resistivity is always positive and the logarithm is used. However, negative apparent resistivity values not caused by noise are observed in 3D distributed IP systems, especially with near-surface large resistivity contrasts and topography. Thus, the logarithm of apparent resistivity is not used because negative apparent resistivity values are real and kept throughout the inversion for a more accurate model. (Loke, 2018)
Forward Modeling Method	The finite-element method with a medium extended 4 horizontal node mesh between electrodes is used for datasets with topography and for improved accuracy.
Non-Linear IP Complex Method	The non-linear method calculates apparent IP using a complex resistivity formula. This method treats the conductivity as a complex quantity with real and imaginary components (Kenma et al. 2000). The complex conductivity and complex potential are calculated. These components are calculated in a two-step inversion process during each iteration. First the resistivity model is calculated, then the IP model is calculated.
IP Model Transformation	The “range-bound” transformation method is used to ensure the model IP values produced by the inversion program does not exceed the lower or upper limits of 0-300 mV/V.

Table 10: Inversion Parameter Descriptions (© (1996-2018) M.H.Loke)

7. RESULTS, INTERPRETATION & CONCLUSIONS

7.1 RESULTS

The inversion was run through many iterations, until an error convergence of less than 1% was achieved. This produced an absolute error of 4.809% and 0.943% for the resistivity and IP models, respectively. Iteration 23 was the chosen version. Eight of the eleven depth sections of the IP and resistivity from the RES3DINV viewer of iteration 22 is shown in the next two figures, respectively. From top left to top right and bottom left to bottom right the blocks are at depths: 30-50m, 50-75m, 75-100m, 100-130m, 130-165m, 205-250m, and 250-300m.

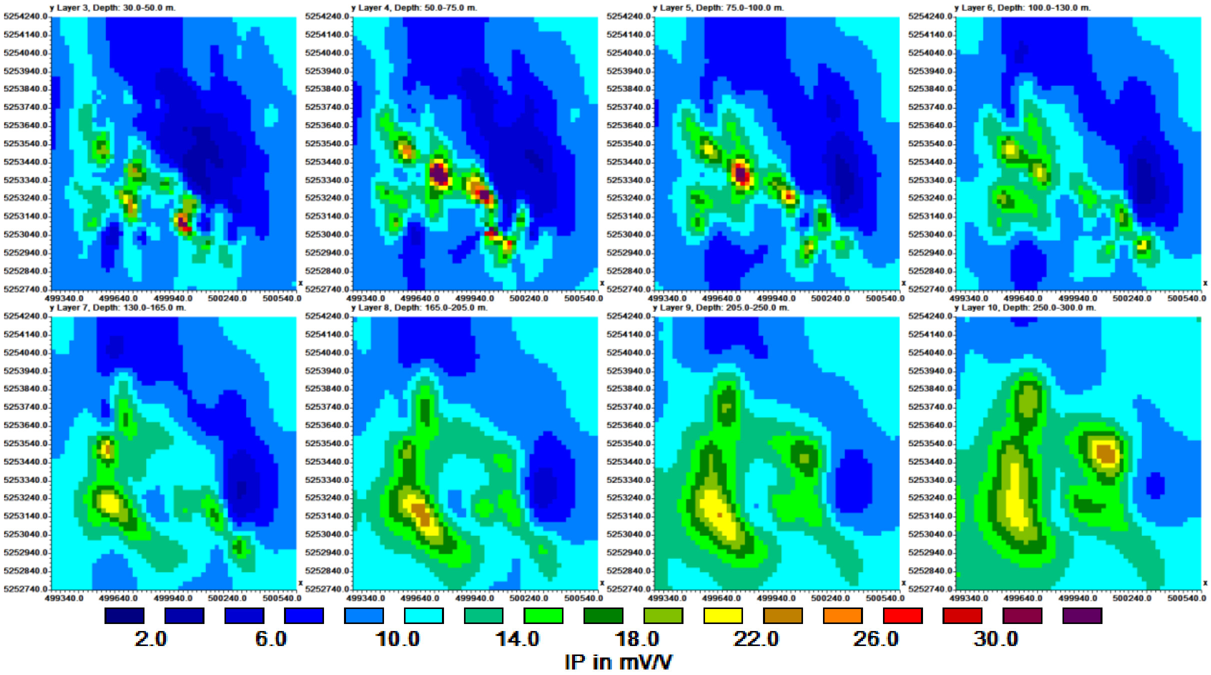

Figure 22: 8 IP depth sections ranging from 0-230m as viewed in RES3DINV

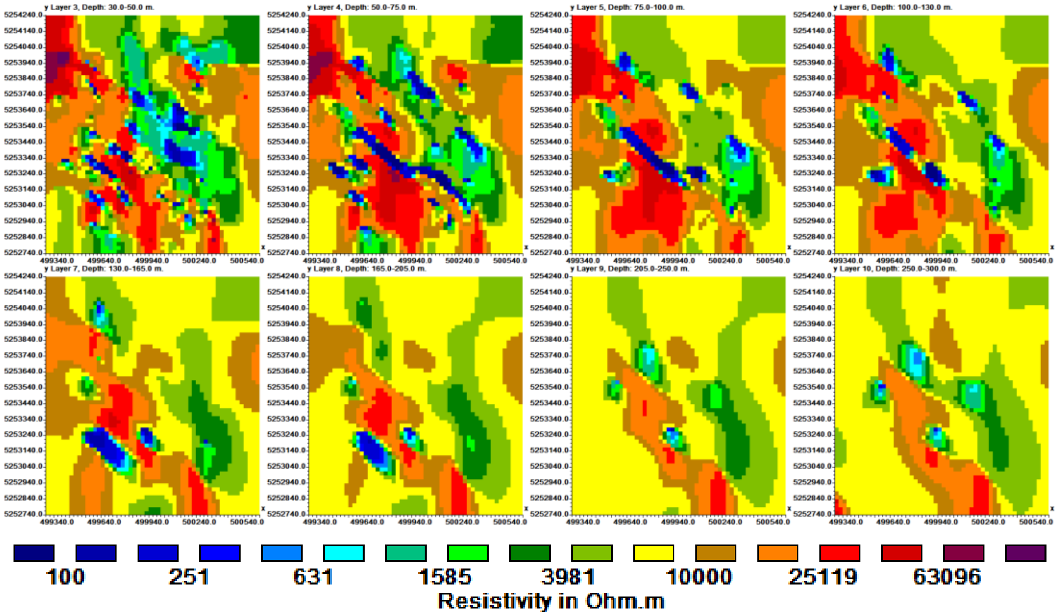

Figure 23: 8 resistivity depth sections ranging from 0-230m as viewed in RES3DINV

A final XYZ was output from iteration 23 of the inversion and provided the resistivity, conductivity, chargeability, and sensitivity values at the centre and the corner of the model blocks. In this case resolution was also calculated. This was imported and modelled in Geosoft Oasis.

A horizontal slice of the chargeability and resistivity from the final inversion model overlaid in Google Earth is seen in the following two figures.

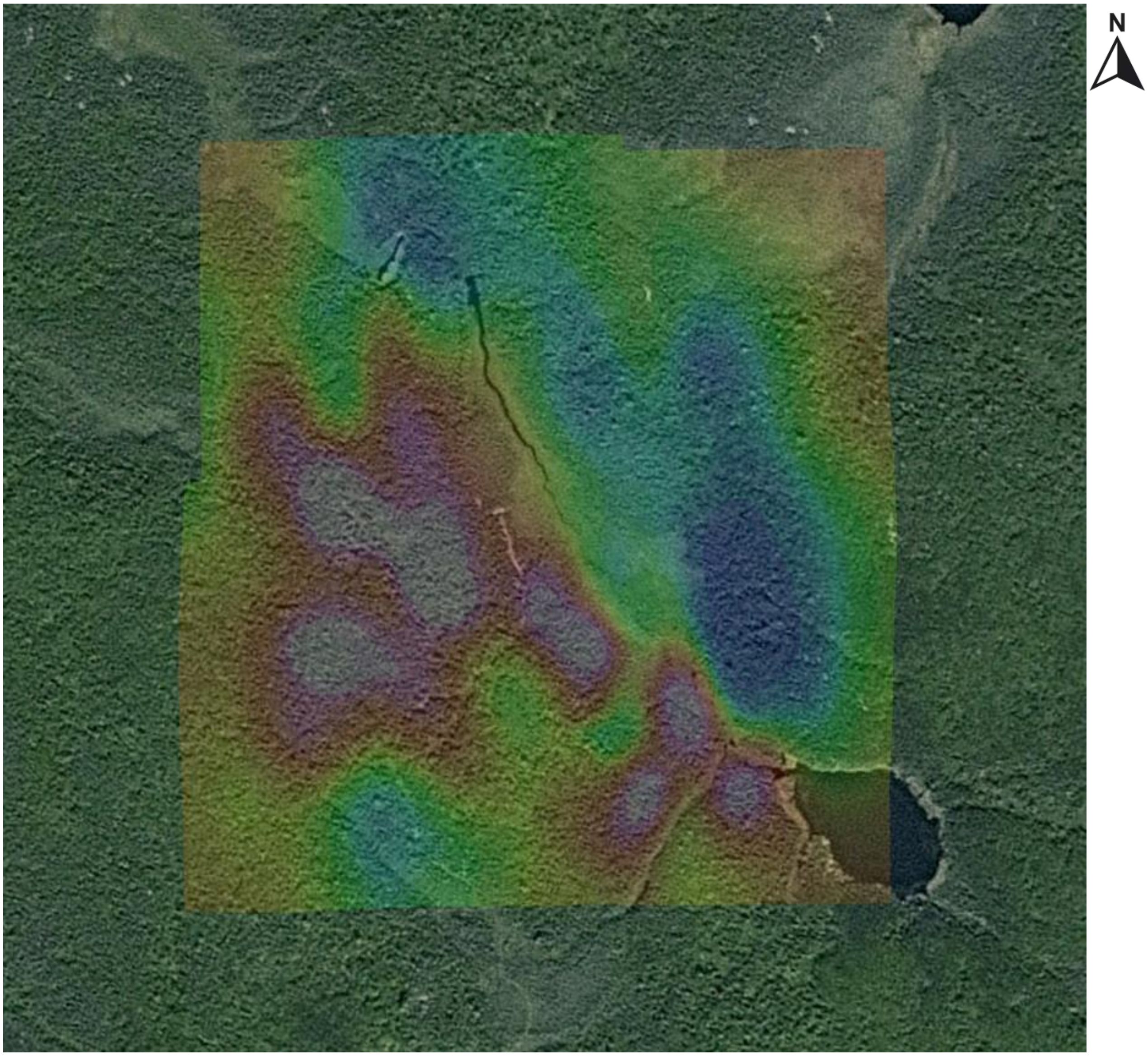

Figure 24: Chargeability grid (300m MSL) overlaying Google Earth. (©2018 Google, Image ©2019 CNES/Airbus)

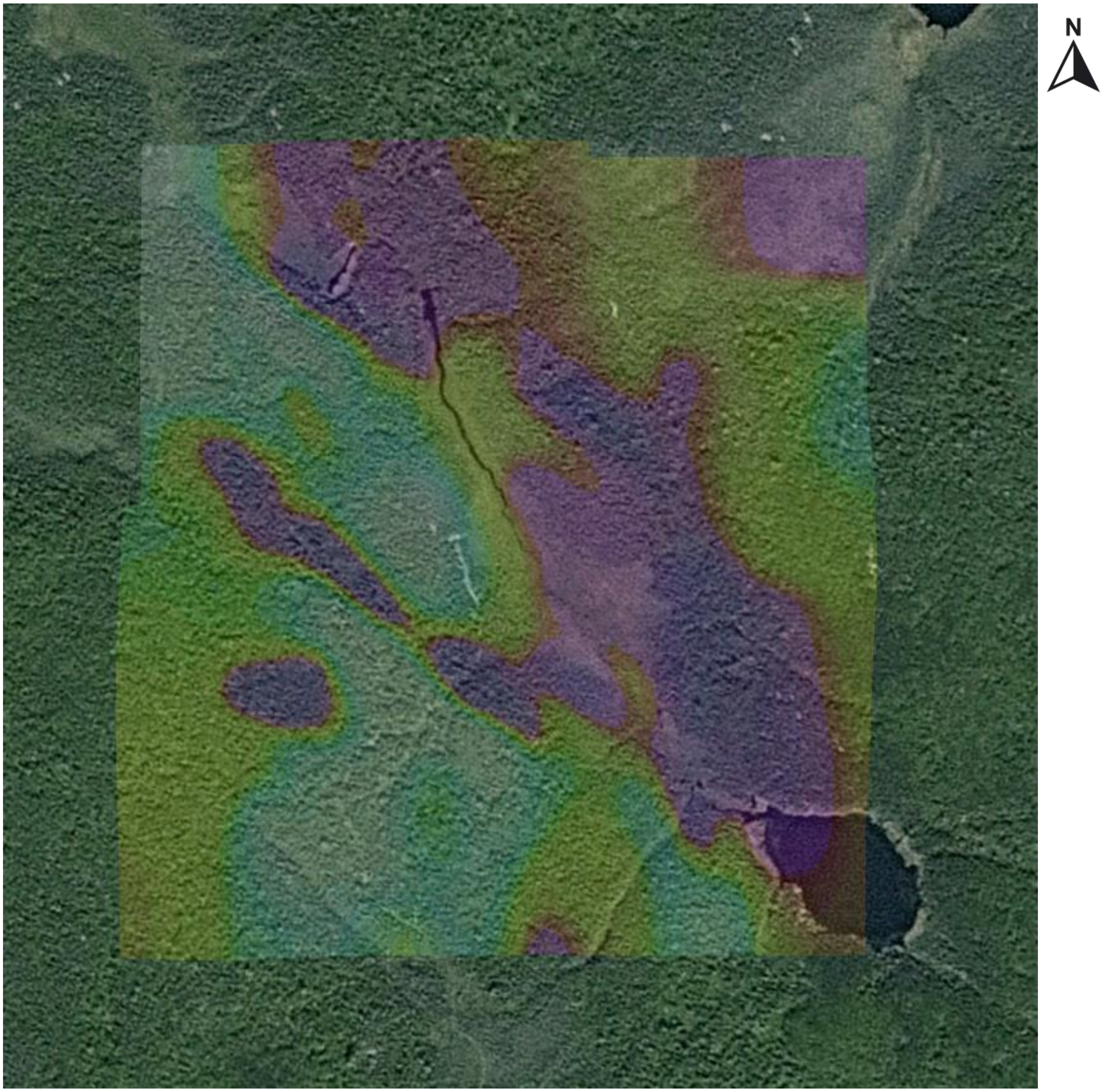

Figure 25: Resistivity grid (300m MSL) overlaying Google Earth. (©2018 Google, Image ©2019 CNES/Airbus)

7.2 INTERPRETATIONS[3]

Targeting of the 3D Distributed IP array was based off of an EM target known as SK2. This target was generated from a recent airborne EM survey.

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[3] Note for all interpretation figures North is in the Y-direction.

No culture that would affect the survey data was noted on the survey grid, however there was a powerline approximately 1.5km west of the grid. The noise was apparent in some of the data sets, however most was filtered out.

Both of the inverted chargeability and resistivity data were modelled in 3D. Some chargeability responses were detected, and the resistivity response was dominated by conductive overburden, however some bedrock sources were identified.

Figures 26 and 27 are examples of the 3D chargeability model at 20mV/V superimposed on a 100 metre MSL chargeability slice. From these models three moderate chargeability anomalies are identified. The three signatures appear similar and strike parallel to each other at approximately 310 degrees (black lines in Figure 27).

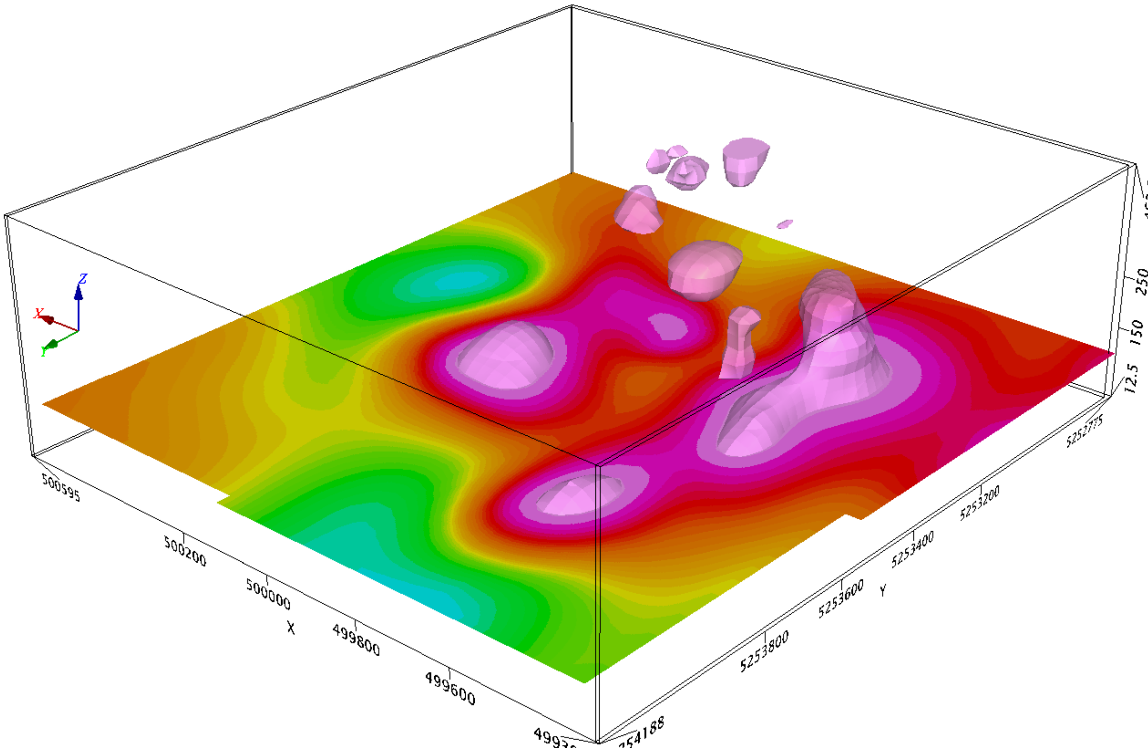


Figure 26: 3D chargeability isosurfaces (pink=20mV/V) with a 100m MSL chargeability slice

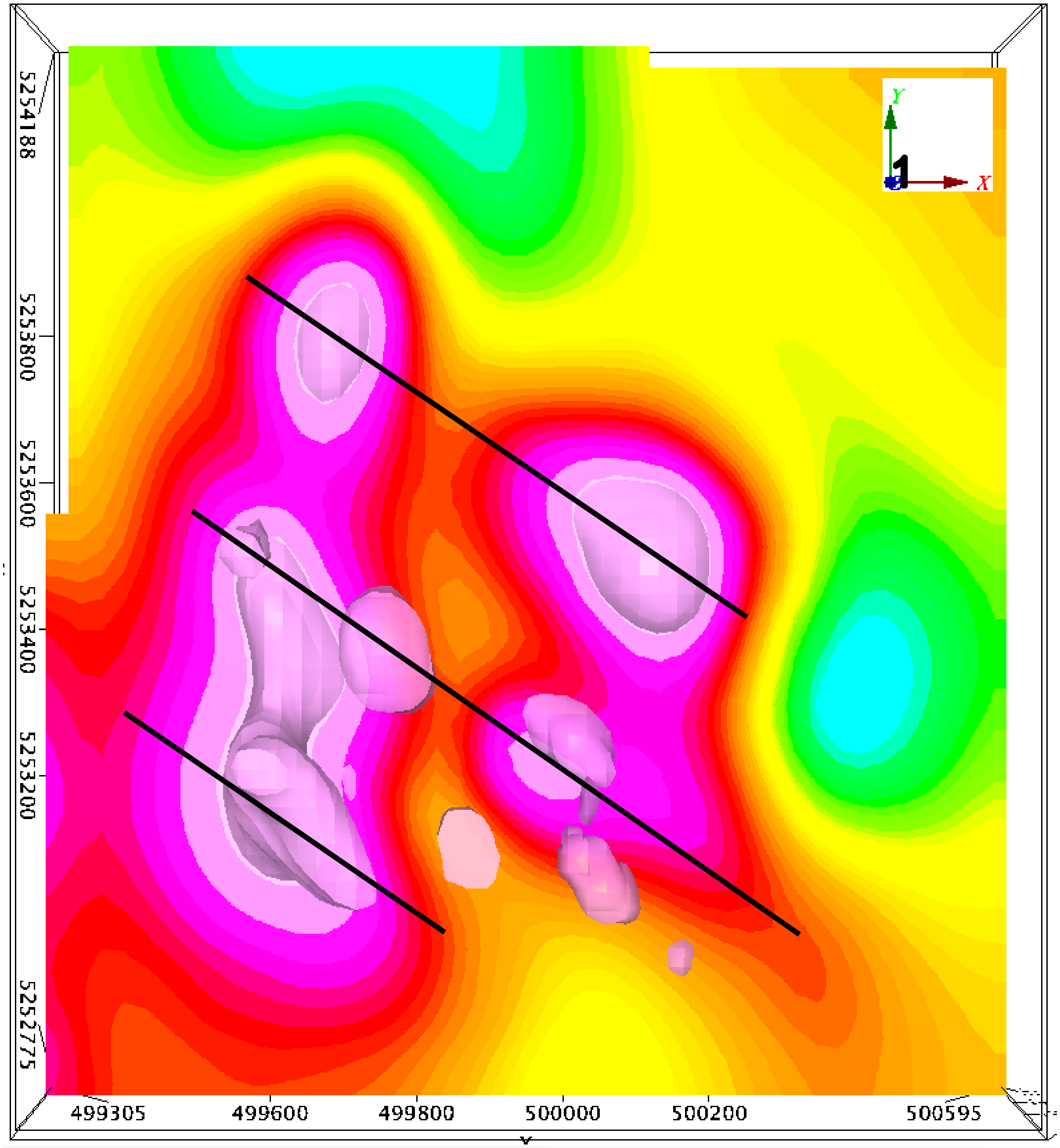


Figure 27: Top view of the 3D chargeability isosurfaces (pink=20mV/V) with a 100m MSL chargeability slice with interpretations (black lines = 310° chargeability signatures).

The dominant low resistivity anomaly was noted to be in the shallow region and coincided with the swamp and creek system. This low resistivity due to the conductive overburden was clipped from the model in the following resistivity figures. Figure 28 and 29 shows the resistivity model on a resistivity 100m MSL plane.

Three resistivity signatures are highlighted in the 3D model. The three signatures appear similar and strike parallel to each other at approximately 310 degrees, however they occur at different depths.

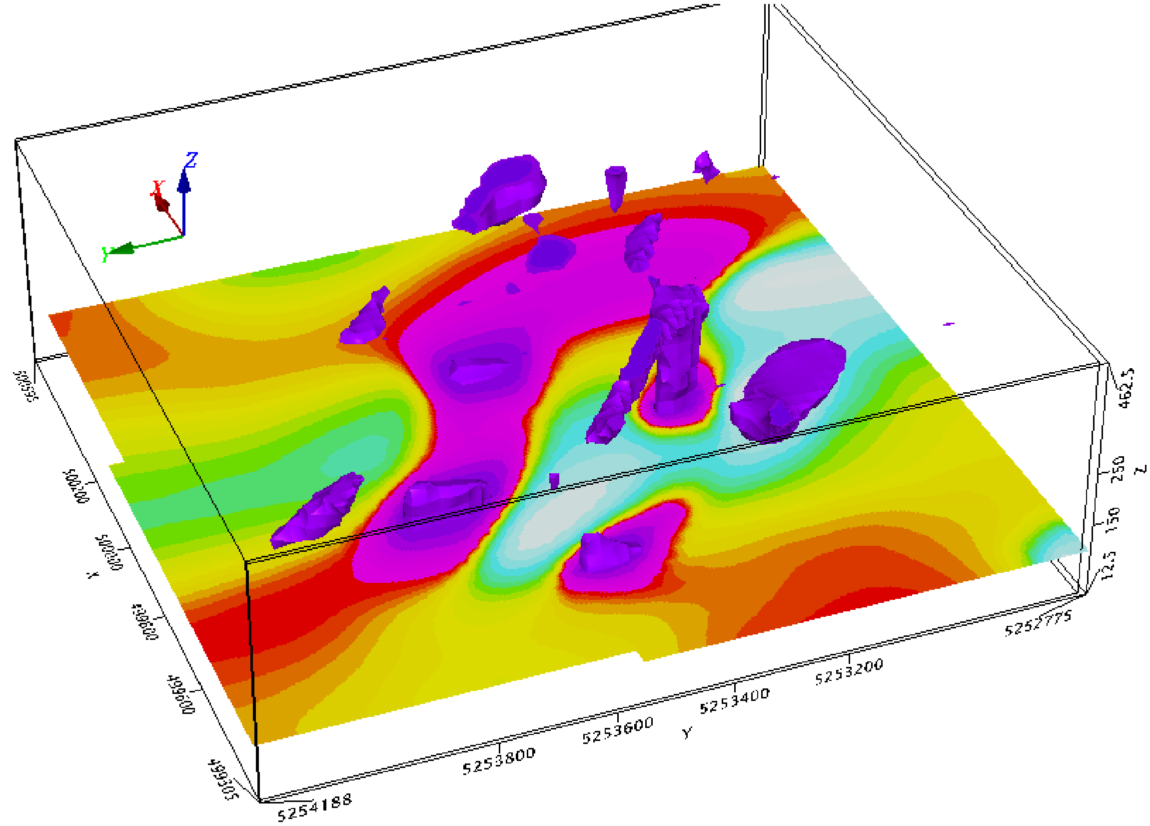


Figure 28: 3D resistivity isosurfaces with 100m MSL slice (purple isosurface = <1000 ohm.m)

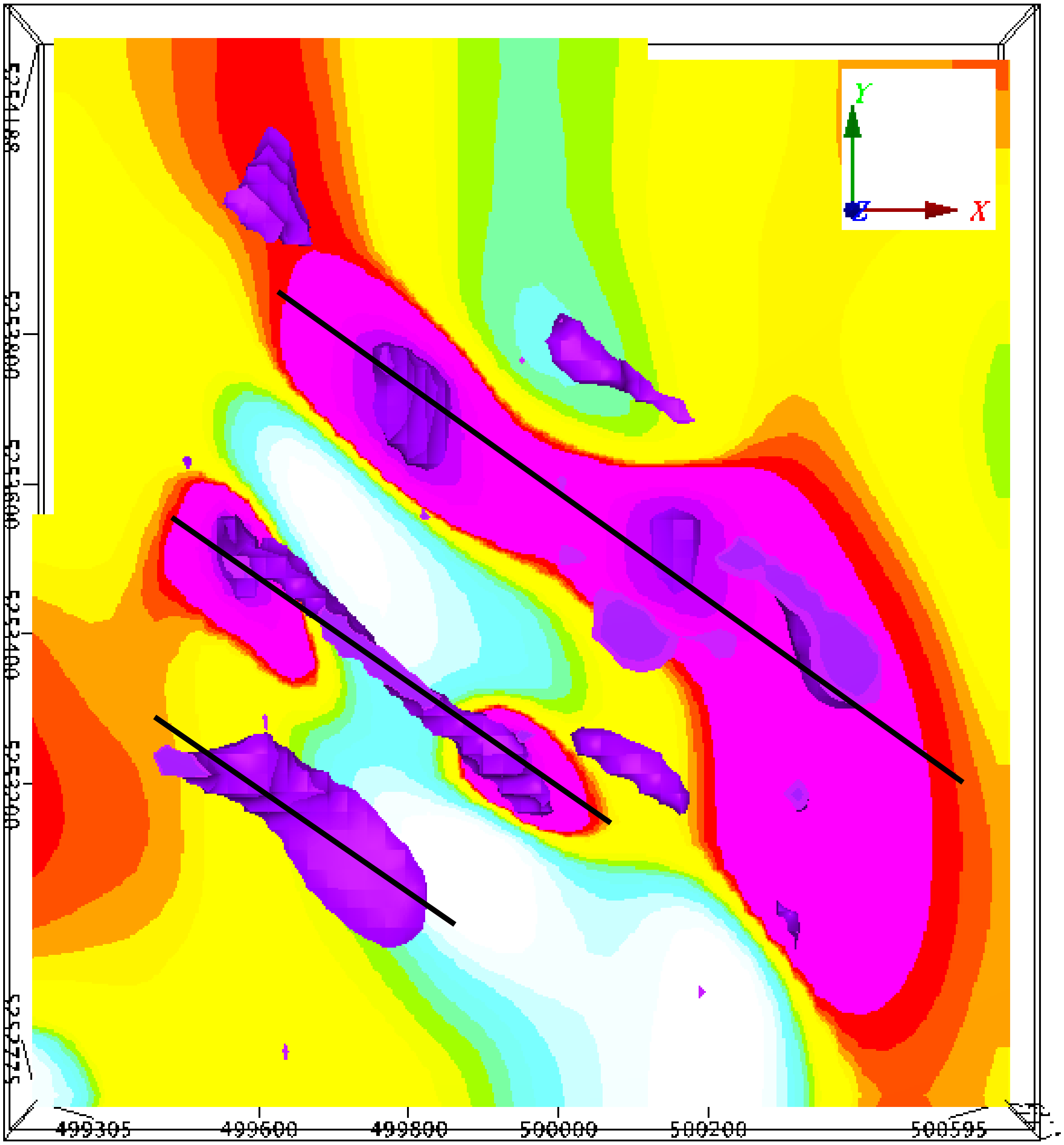


Figure 29: 3D resistivity isosurfaces with 100m MSL slice (purple isosurface = <1000 ohm.m). Black lines indicate

With the low resistivity and high chargeability modeled together (Figure 30) a correlation between the anomalies can be seen. This indicates that they are likely related to similar parallel sources. The source of these anomalies also appears to trend from areas of low resistivity to areas of high chargeability. This indicates that they may be related to a series of narrow bands of mineralized interflow sediments.

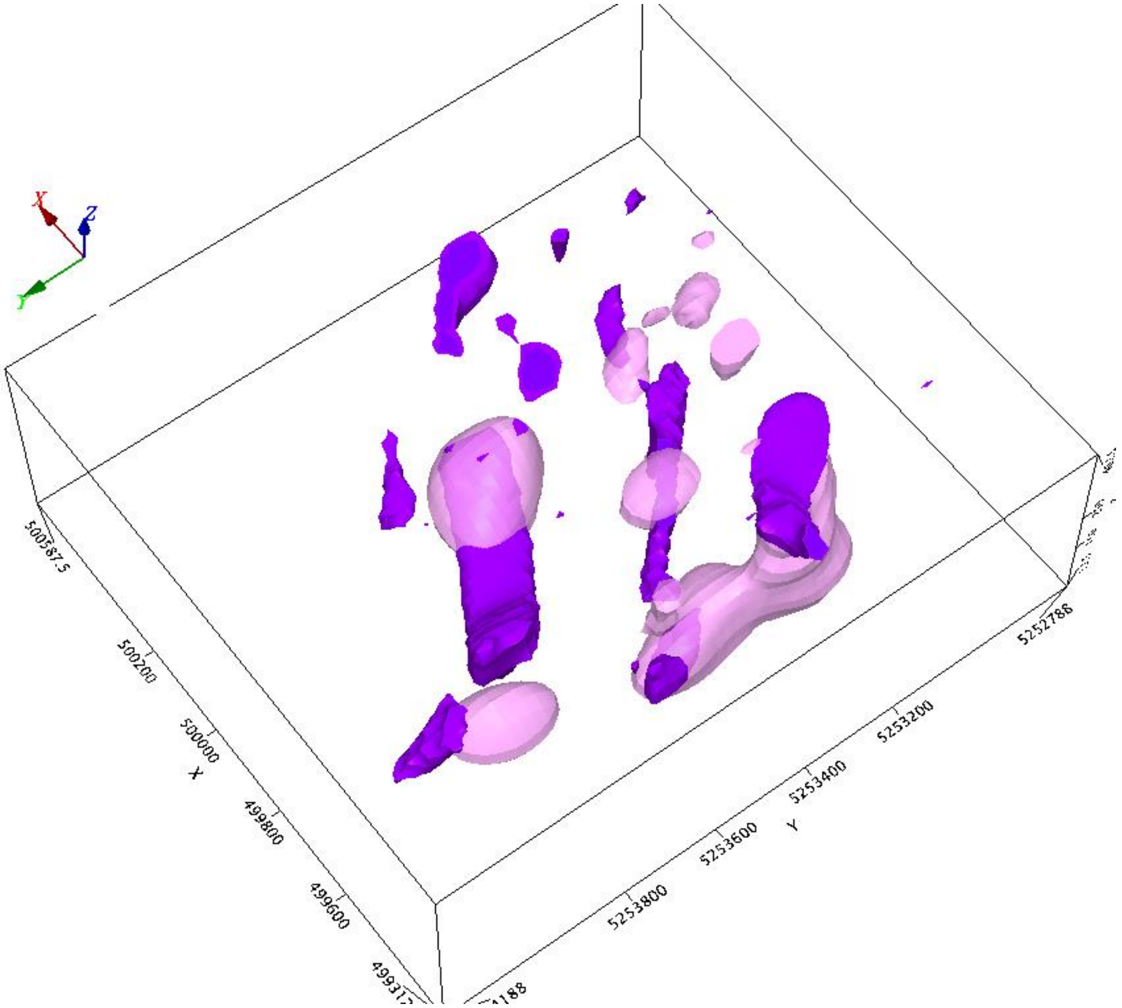


Figure 30: 3D resistivity isosurface (purple <1000 ohm.m) with 3D chargeability isosurface (pink >20 mV/V)

7.3 RECOMMENDATIONS

It is recommended that historic work be compiled. This compilation overlaid on the present geophysical maps may provide information on the sources of the anomalies and allow for better identification and correlation to the expected geophysical signatures.

The anomalous trends do not appear to continue to surface which would make prospecting them difficult. A soil sampling program is an alternative option, which may assist in indicating if favourable mineralization is present.

A magnetic survey performed over the survey area would help determine if the mineralization is related to sulphides or graphite. Following a magnetic survey, drill testing of the anomalies is recommended.

7.4 CONCLUSIONS

The 3D IP survey highlighted three narrow, short, and linear chargeability and low resistivity anomalies. These anomalies appear parallel to each other and most likely represent interflow sediments.

APPENDIX A

STATEMENT OF QUALIFICATIONS

I, C. Jason Ploeger, hereby declare that:

1. I am a professional geophysicist with residence in Larder Lake, Ontario and am presently employed as a Geophysicist and Geophysical Manager of Canadian Exploration Services Ltd. of Larder Lake, Ontario.

2. I am a Practicing Member of the Association of Professional Geoscientists, with membership number 2172.

3. I graduated with a Bachelor of Science degree in geophysics from the University of Western Ontario, in London Ontario, in 1999.

4. I have practiced my profession continuously since graduation in Africa, Bulgaria, Canada, Mexico and Mongolia.

5. I am a member of the Ontario Prospectors Association, a Director of the Northern Prospectors Association and a member of the Society of Exploration Geophysicists.

6. I do not have nor expect an interest in the properties and securities of **Battery Mineral Resources Ltd.**

7. I am responsible for the final processing and validation of the survey results and the compilation of the presentation of this report. The statements made in this report represent my professional opinion based on my consideration of the information available to me at the time of writing this report.

C. JASON PLOEGER
PRACTISING MEMBER
2172

C. Jason Ploeger, P.Geo., B.Sc.
Geophysical Manager
Canadian Exploration Services Ltd.

Larder Lake, ON
April 3, 2019

APPENDIX A

STATEMENT OF QUALIFICATIONS

I, Melanie Postman, hereby declare that:

1. I am a Geoscientist-in-Training with residence in Larder Lake, Ontario and am presently employed as a Junior Geophysicist with Canadian Exploration Services Ltd. of Larder Lake, Ontario.
2. I graduated with a Bachelor of Science Honors specialization degree in geophysics for professional registration from the University of Western Ontario, in London Ontario, in 2017.
3. I am a member of the Association of Professional Geoscientists as a Geoscientist-in-Training (Member ID 10710).
4. I have previous geophysical work experience during and following my education.
5. I do not have nor expect an interest in the properties and securities of **Battery Mineral Resources Ltd.**
6. I am responsible for assisting with the final processing and validation of the survey results and the compilation of the presentation of this report. The statements made in this report represent my opinion based on my consideration of the information available to me at the time of writing this report.

Melanie Postman, GIT, B.Sc.
Junior Geophysicist

Larder Lake, ON
April 3, 2019

APPENDIX A

STATEMENT OF QUALIFICATIONS

I, Mandy Lim, hereby declare that:

1. I am a Geoscientist-in-Training with residence in Virginiatown, Ontario and am presently employed as a Junior Geophysicist with Canadian Exploration Services Ltd. of Larder Lake, Ontario.

2. I graduated with a Bachelor of Science Honours specialization degree in earth sciences, with focus on geophysics from Memorial University of Newfoundland, in St. John’s, Newfoundland, in 2018.

3. I am a member of the Professional Engineers and Geoscientists Newfoundland and Labrador as a Geoscientist-in-Training under registration number G4352.

4. I have previous geological and geophysical work experience during my education.

5. I do not have nor expect an interest in the properties and securities of **Battery Mineral Resources Ltd**.

6. I am responsible for assisting with the final processing and validation of the survey results and the compilation of the presentation of this report. The statements made in this report represent my opinion based on my consideration of the information available to me at the time of writing this report.

Mandy Lim

Mandy Lim, G.I.T., B.Sc.
Junior Geophysicist

Larder Lake, ON
April 3, 2019

APPENDIX A

STATEMENT OF QUALIFICATIONS

I, Andrew Salerno, hereby declare that:

1. I am a soon-to-be Geoscientist-in-Training with residence in Virginiatown, Ontario and am presently employed as a Junior Geologist with Canadian Exploration Services Ltd. of Larder Lake, Ontario.

2. I graduated with a Bachelor of Science Honors specialization in geology from the University of Waterloo, in Waterloo, Ontario, in 2018.

3. I am currently undergoing the application process to register as a Geoscientist-in-Training to later become a practicing member of the Association of Professional Geoscientists.

4. I do not have nor expect an interest in the properties and securities of **Battery Mineral Resources Ltd.**

5. I am responsible for assisting with the final processing and validation of the survey results and the compilation of the presentation of this report. The statements made in this report represent my professional opinion based on my consideration of the information available to me at the time of writing this report.

Andrew Salerno, B.Sc.
Junior Geologist
(non-Professional)

Larder Lake, ON
April 3, 2019

APPENDIX B

IRIS V-FullWaver Receiver[4]

2 CHANNELS IP FULL WAVE RECORD

- 2 simultaneous dipoles
- Several weeks recording
- Time stamped data

V-Full Waver: this logger for electrical signal is a new concept of compact and low consumption unit designed for advanced Time Domain Induced Polarization, Resistivity and SP measurements. It can work in all field conditions, small, discrete, autonomous and can record continuously without operator.

Compactness: light, discrete and easy to setup on the field, even on remote areas. Autonomous two dipoles logger, no need of the operator during acquisition. V-Full Waver allows a high productivity for dipole-dipole, gradient, extended pole-pole and other arrays. A network of several tens of channels can be quickly installed on the field for deep exploration and advanced processing (perpendicular dipoles, remote reference...)

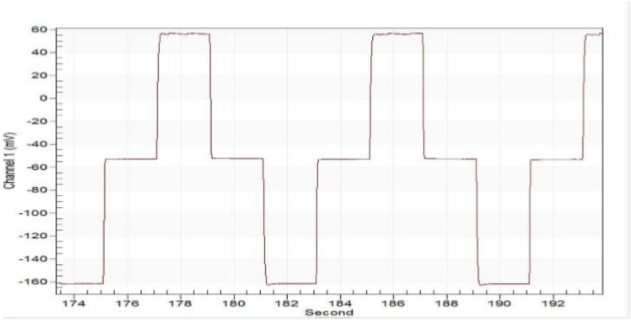
Internal GPS: an integrated GPS, very accurate and providing PPS signal (one pulse per second) allows to store all time series with time information. This is crucial to process data from several V-Full Waver loggers installed in a same area. This is also useful to correlate with injection dipole waveform, in case this has also been recorded with a I-Full Waver logger.

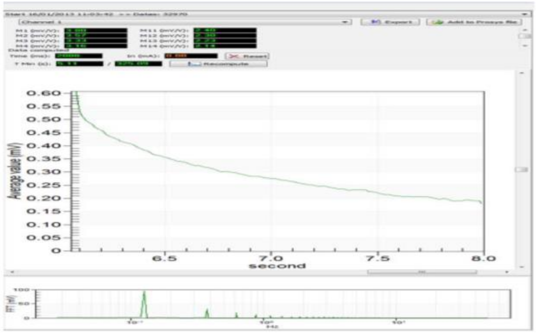
---

[4] Information obtained from http://www.iris-instruments.com/Pdf_file/V_fullwaver.pdf

High resolution: samples are recorded every 10 (ten) milliseconds (100 Hz sampling frequency). Data from several recorders can be merged and processed together with the Full Wave Viewer program delivered with the system. All data is synchronized through the GPS-PPS time stamping. A post acquisition processing permits to improve the signal-to-noise ratio. This also allows good quality IP data for deep investigations and for noisy areas.

Internal memory: the memory can store up to one month recording time. Then data can directly be transferred to a USB key in a few seconds.





TECHNICAL SPECIFICATIONS

- Max. input voltage: 15 V
- Protection: up to 1 000 V
- Accuracy: 0.2 % typical
- Resolution: 10 µV
- Sampling rate: 10 milli seconds (100 Hz)
- Induced Polarization (chargeability) measured every 10 milliseconds (200 IP windows for a 2 sec pulse)
- Input impedance: 100 MΩ
- Low pass filter Cut off frequency: 10 Hz
- Upper frequency which can be resolved: 50 Hz
- Frequency resolution: up to 34 micro Hz
- Internal GPS with PPS (one pulse per second)
- Time resolution: 250 micro seconds (time stamped samples)
- Battery test
- Contact resistance check

GENERAL SPECIFICATIONS

- LCD display, graphic and alpha numeric with 16 lines of 40 characters
- Data flash memory: one-month recording
- After acquisition: possibility of data storage on a USB key (8 GB or more).
- Power supply: internal Li-Ion rechargeable battery; optional external 12V standard car battery can be also used

- Autonomy: 20 operating hours with the internal Li-Ion battery
- Weather proof IP 67
- Shock resistant resin NK-7, case with handle
- Operating temperature: -20 °C to +70 °C
- Dimensions: 31 x 25 x 15 cm
- Weight: 2.8 kg

APPENDIX B

IRIS I-FullWaver Current Monitor[5]

IP Fullwave Record

- Recording injected current
- Several weeks recording
- Time stamped data

Fullwaver: this logger for electrical signal is a new concept of compact and low consumption unit designed for advanced Time Domain Induced Polarization, Resistivity and SP measurements. It can work in all field conditions, small, discrete, autonomous and can record continuously without operator. I-Fullwaver is connected in series on the AB injection line, it measures and logs very accurately the injected current IAB.

Compactness: light, discrete and easy to setup on the field, even on remote areas. This autonomous logger does not need any operator during the acquisition. I-Fullwaver is connected close to the transmitter or close to any injection electrode

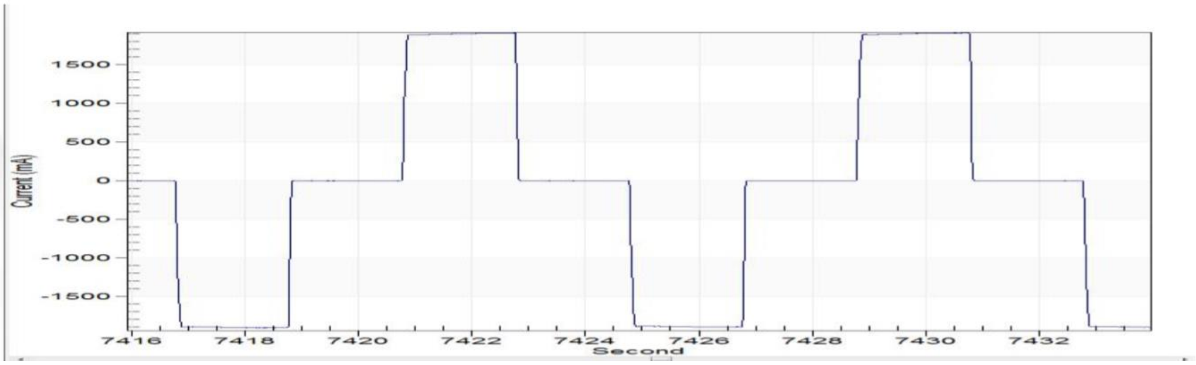
Integrated GPS: an integrated gps, very accurate and providing PPS signal (one pulse per second) allows to store all time series with time information. This is crucial to correlate and process data with V-Fullwaver receiver loggers installed in a same area. This information displays the behaviour of the transmitter, its regulation specifications and the value of Iab in order to compute accurately the apparent resistivity.

---

[5] Information obtained from http://www.iris-instruments.com/Pdf_file/I_fullwaver.pdf

High resolution: samples are recorded every 10 (ten) milliseconds (100 Hz sampling frequency). Data from several recorders (for current and received voltages) can be merged and processed together with the FullWaveViewer program delivered with the system. All data is synchronized through the GPS-PPS time stamping. A post acquisition processing allows to improve the signal-to-noise ratio, giving good quality IP data for deep investigations in noisy areas.

Internal memory: the memory can store up to three months recording time. Then data can directly be transferred to a USB key in a few seconds.



TECHNICAL SPECIFICATIONS

- Current range: +/- 25 000 mA
- Current resolution: 0.1 mA
- Accuracy: +/- 1 mA
- Protection: up to 50 A and 3 000 V
- Magnetic sensor
- Magnetization offset (offset memory): up to 0.05%
- Offset calibration
- Sampling rate: 10 milliseconds (100 Hz)
- Integrated GPS with PPS (one pulse per second)
- Time resolution: 250 micro seconds (time stamped samples)
- Battery test

GENERAL SPECIFICATIONS

- LCD display, alpha numeric with 4 lines of 20 characters
- Data flash memory: three months recording
- After acquisition: possibility of data storage on a USB key (8 Gb or more).
- Power supply: internal Li-Ion rechargeable battery; optional external 12V standard car battery can be also used
- Autonomy: 20 operating hours with the internal Li-Ion battery.
- Weather proof IP 67
- Shock resistant resin NK-7, case with handle
- Operating temperature: -20 °C to +70 °C
- Dimensions: 31 x 25 x 15 cm
- Weight: 3.0 kg

APPENDIX B

GGD II 5kW

SPECIFICATIONS

- Protection against short circuits even at 0 ohms
- Output Voltage range: 150V to 2400V in 14 steps
- Power source is a standard 220/240V, 20/60 Hz source
- Displays electrode contact, transmitting power and current

ELECTRICAL CHARACTERISTICS

- Standard Time Base of 2 seconds for time domain – 2 seconds on, 2 seconds' off
- Optional Time Base of DC, 0.5, 1, 2, 4 or 8 seconds
- Output Current Range, 0.030 to 10A
- Output Voltage Range, 150 to 2400V in 14 steps
- Ability to Link 2 GDD transmitters to double power output

CONTROLS

- Switch ON/OFF
- Output Voltage Range Switch: 150V, 180V, 350V, 420V, 500V, 600V, 700V, 840V, 1000V, 1200V, 1400V, 1680V, 2000V and 2400V

DISPLAYS

- Output Current LCD: reads +- 0.0010A

- Electrode Contact Displayed when not Transmitting
- Output Power Displayed when Transmitting
- Automatic Thermostat controlled LCD heater for LCD
- Total Protection Against Short Circuits
- Indicator Lamps Indicate Overloads
-

GENERAL SPECIFICATIONS

- Weather proof
- Shock resistant pelican case
- Operating temperature: -40 °C to +65 °C
- Dimensions: 26 x 45 x 55 cm
- Weight: 40 kg

APPENDIX C

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APPENDIX D

DIGITAL DATA

The digital data contains

- PDF copy of this report
- PDF copy of the maps
- Raw data in binary format
- Raw data in CSV format
- Ascii XYZ of inversion results
- RES3DINV INV output of inversion results
- Text document of electrode GPS Coordinates
- KMZ of final survey layout
- Packed Oasis maps
- Oasis databases
- 3D Oasis voxels created

APPENDIX E

LIST OF MAPS (IN MAP POCKET)

Grid Sketch (1:5000)

1) Q2610-Battery-McAra-SK2-3DIP-Layout-Claims

IP Plan Map (1:5000)

2) Q2610-Battery-McAra-SK2-3DIP-INV-CHR-450MSL
3) Q2610-Battery-McAra-SK2-3DIP-INV-CHR-400MSL
4) Q2610-Battery-McAra-SK2-3DIP-INV-CHR-350MSL
5) Q2610-Battery-McAra-SK2-3DIP-INV-CHR-300MSL
6) Q2610-Battery-McAra-SK2-3DIP-INV-CHR-250MSL
7) Q2610-Battery-McAra-SK2-3DIP-INV-CHR-200MSL
8) Q2610-Battery-McAra-SK2-3DIP-INV-CHR-150MSL
9) Q2610-Battery-McAra-SK2-3DIP-INV-CHR-100MSL
10) Q2610-Battery-McAra-SK2-3DIP-INV-RES-450MSL
11) Q2610-Battery-McAra-SK2-3DIP-INV-RES-400MSL
12) Q2610-Battery-McAra-SK2-3DIP-INV-RES-350MSL
13) Q2610-Battery-McAra-SK2-3DIP-INV-RES-300MSL
14) Q2610-Battery-McAra-SK2-3DIP-INV-RES-250MSL
15) Q2610-Battery-McAra-SK2-3DIP-INV-RES-200MSL
16) Q2610-Battery-McAra-SK2-3DIP-INV-RES-150MSL
17) Q2610-Battery-McAra-SK2-3DIP-INV-RES-100MSL

TOTAL MAPS = 17

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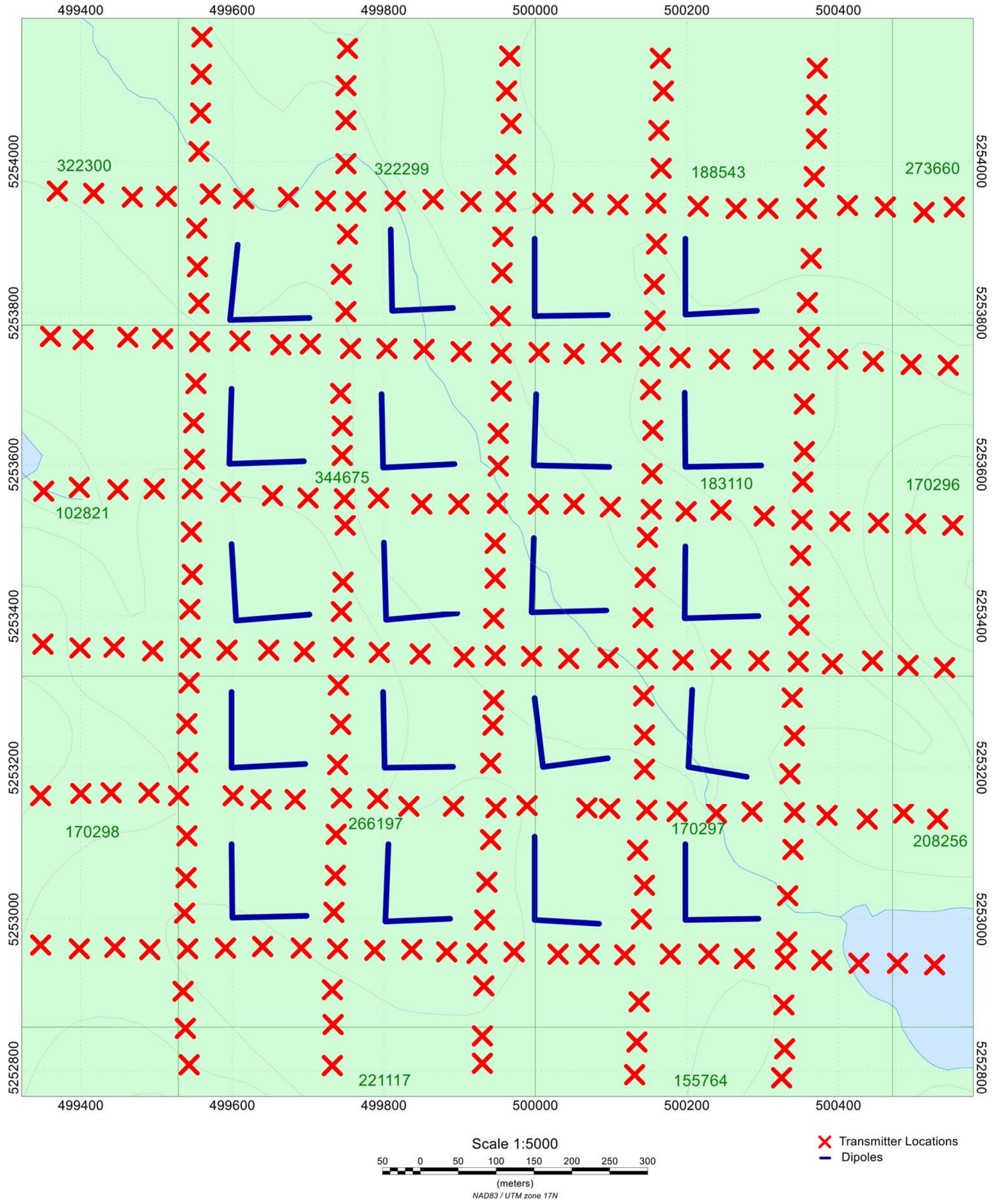

BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Survey Layout
Operational Claim Fabric

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS
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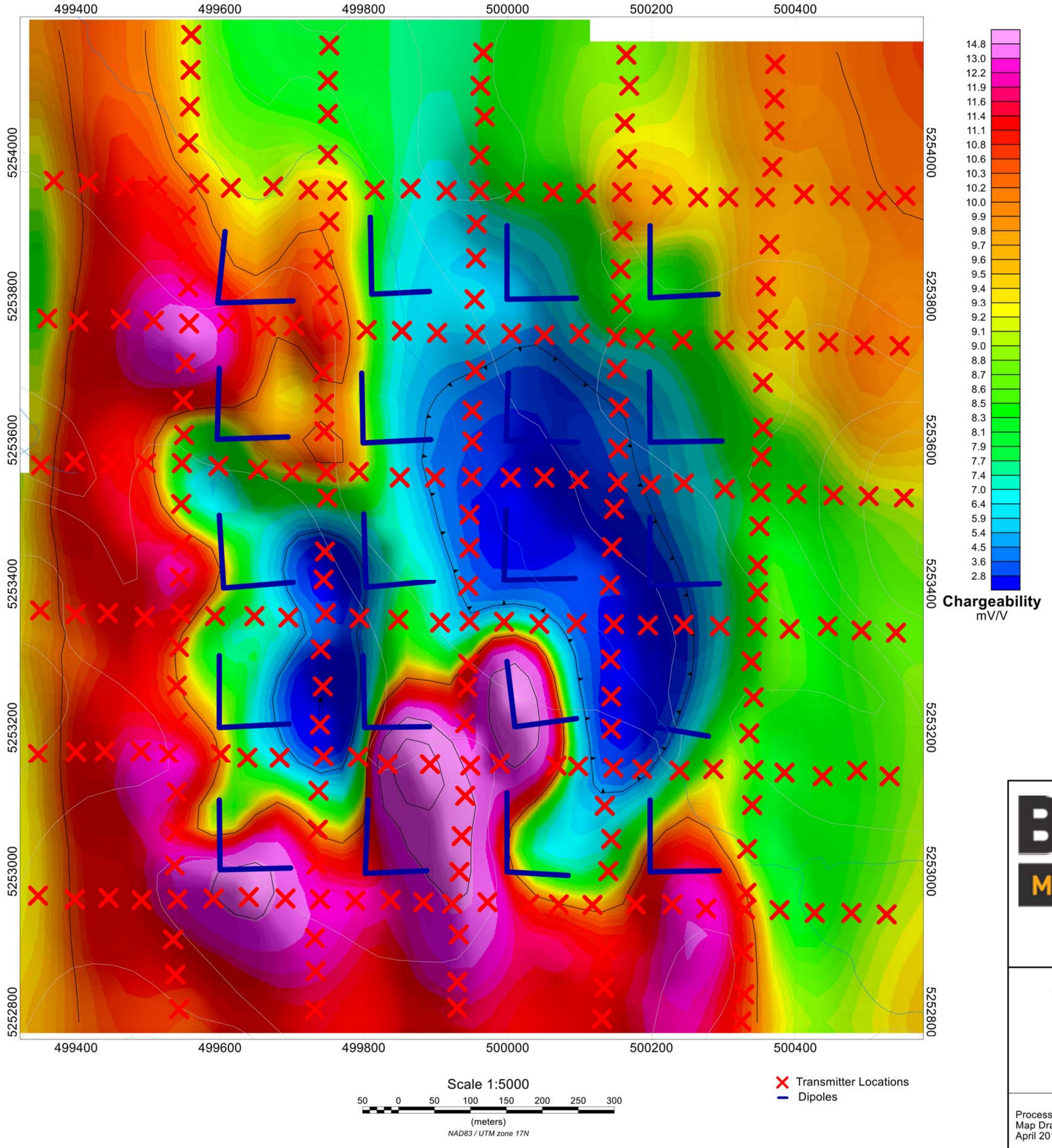
Drawing: Q2610-Battery-McAra-SK2-3DIP-Layout-Claims



BATTERY MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Chargeability Inversion Slice at 450m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 mV/V

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

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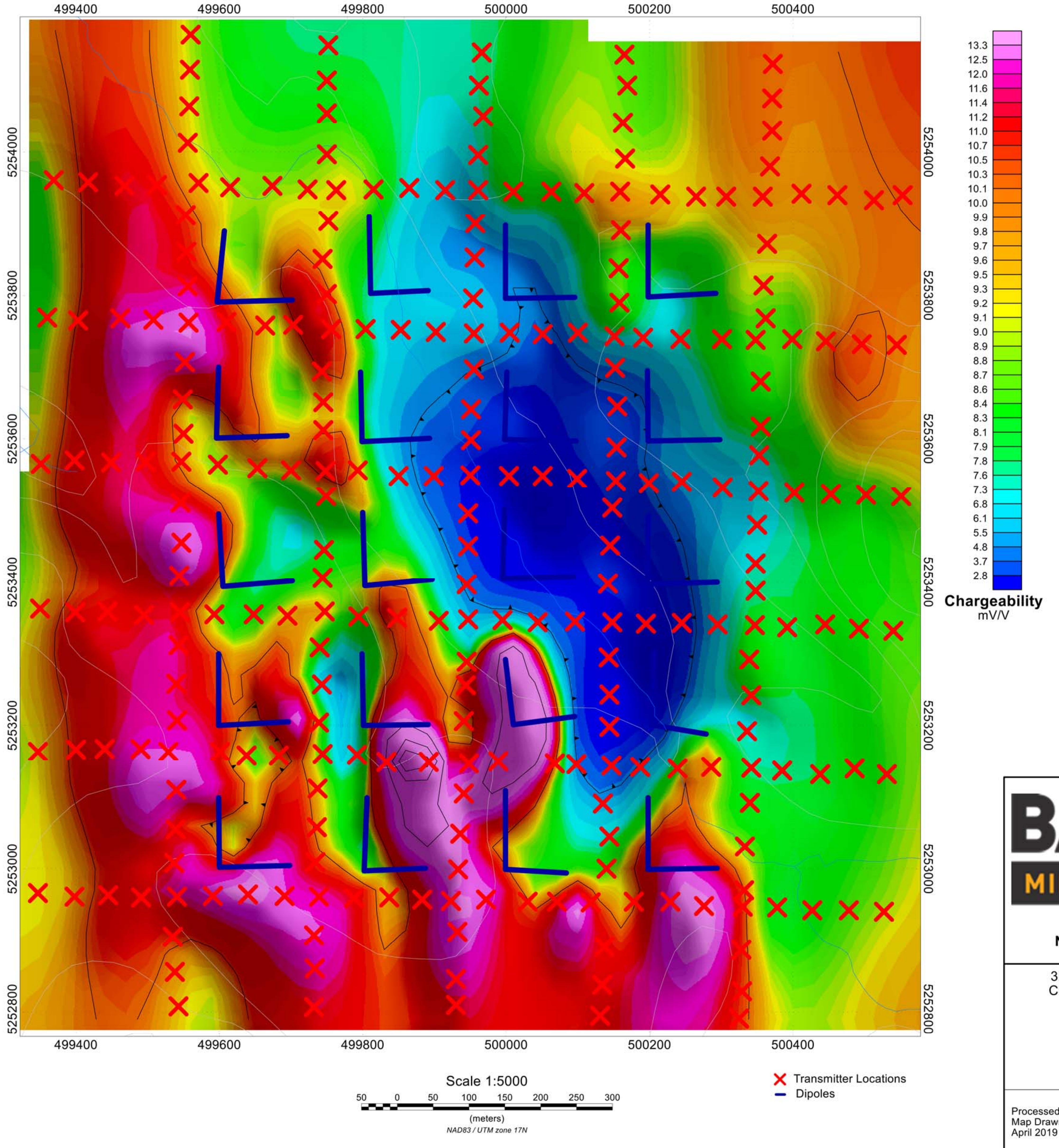
Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-CHR-450MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Chargeability Inversion Slice at 400m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 mV/V

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

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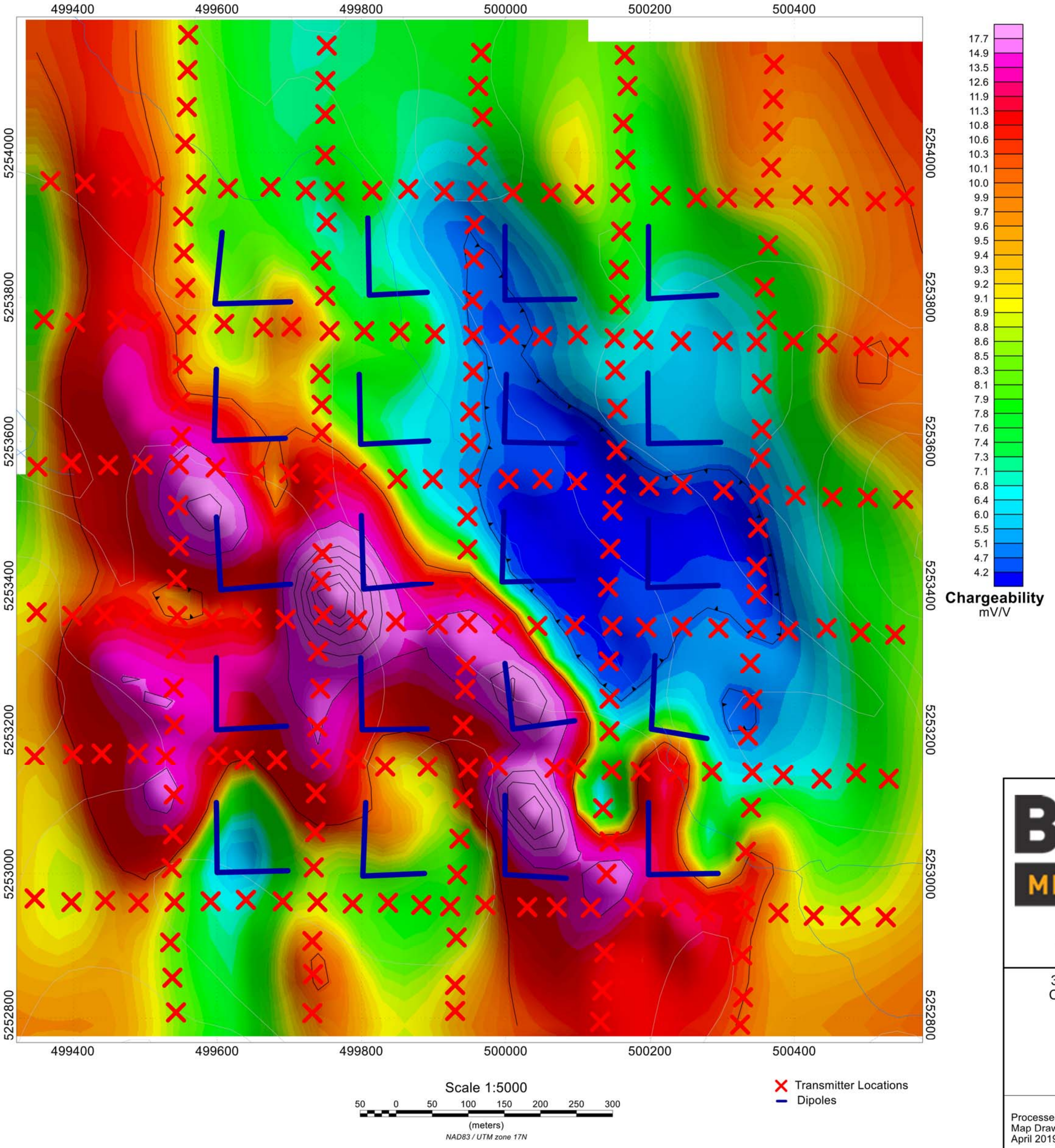
Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-CHR-400MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Chargeability Inversion Slice at 350m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 mV/V

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

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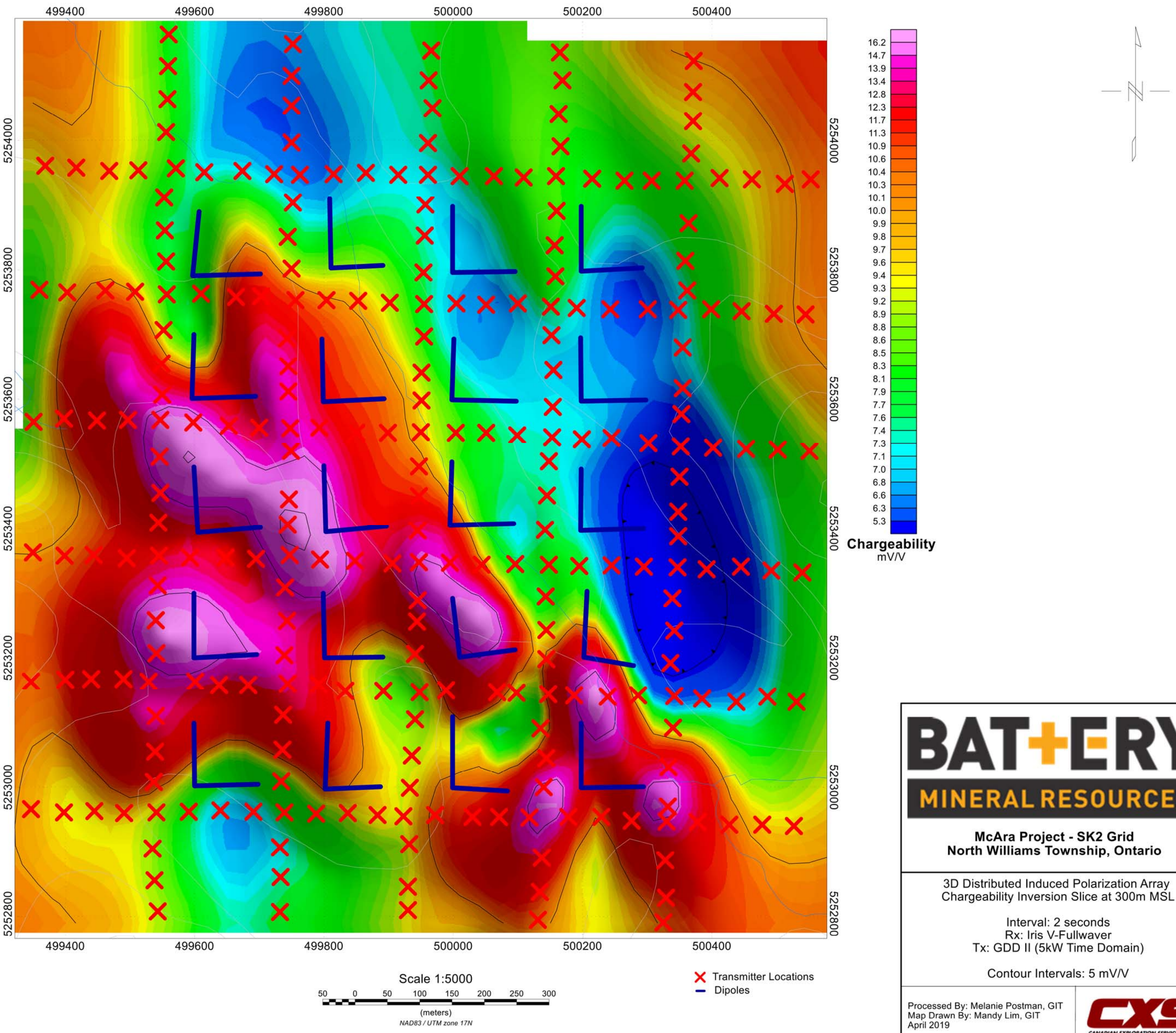
Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-CHR-350MSL



BATTERY MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Chargeability Inversion Slice at 300m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 mV/V

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
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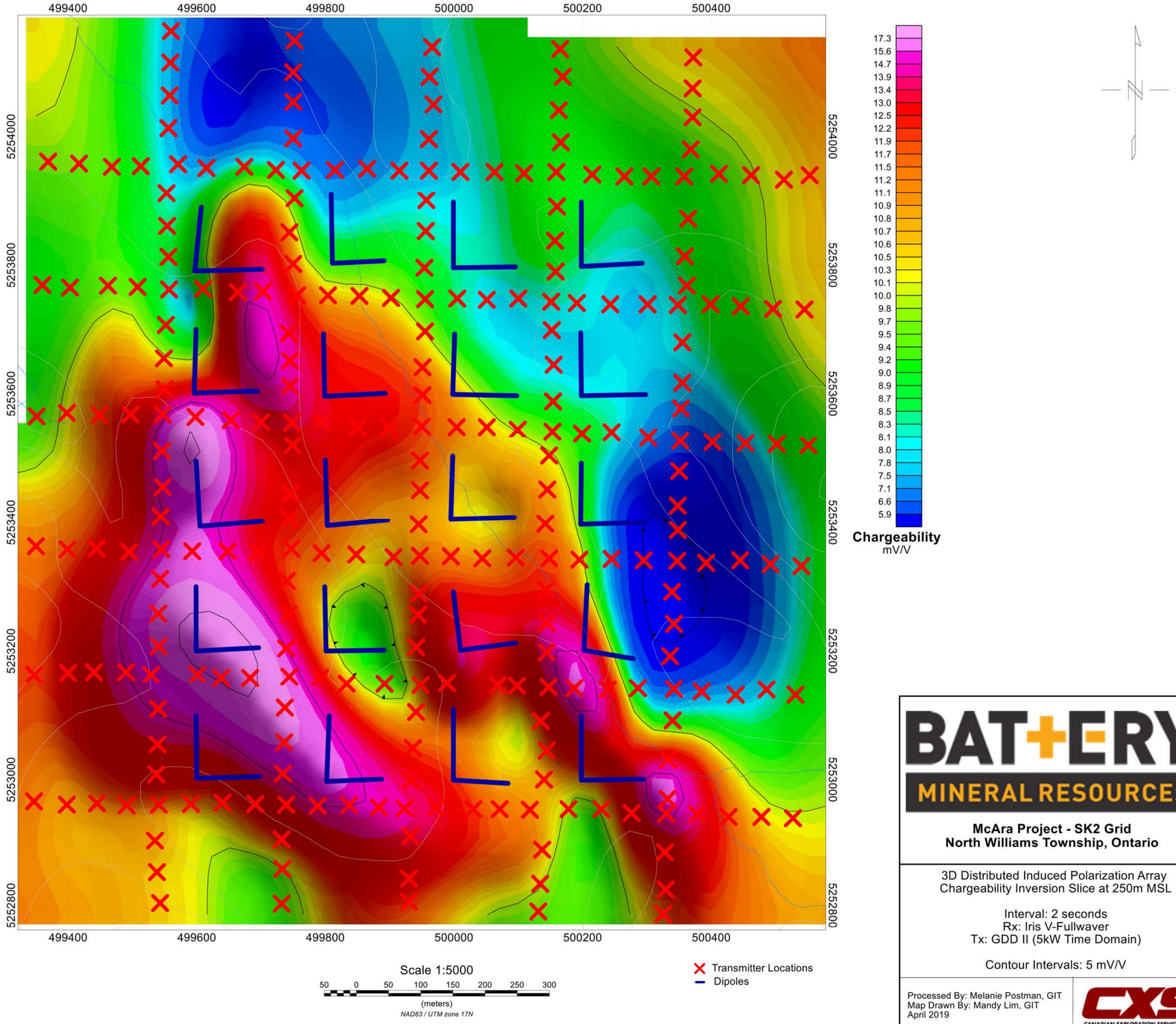
Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-CHR-300MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Chargeability Inversion Slice at 250m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 mV/V

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

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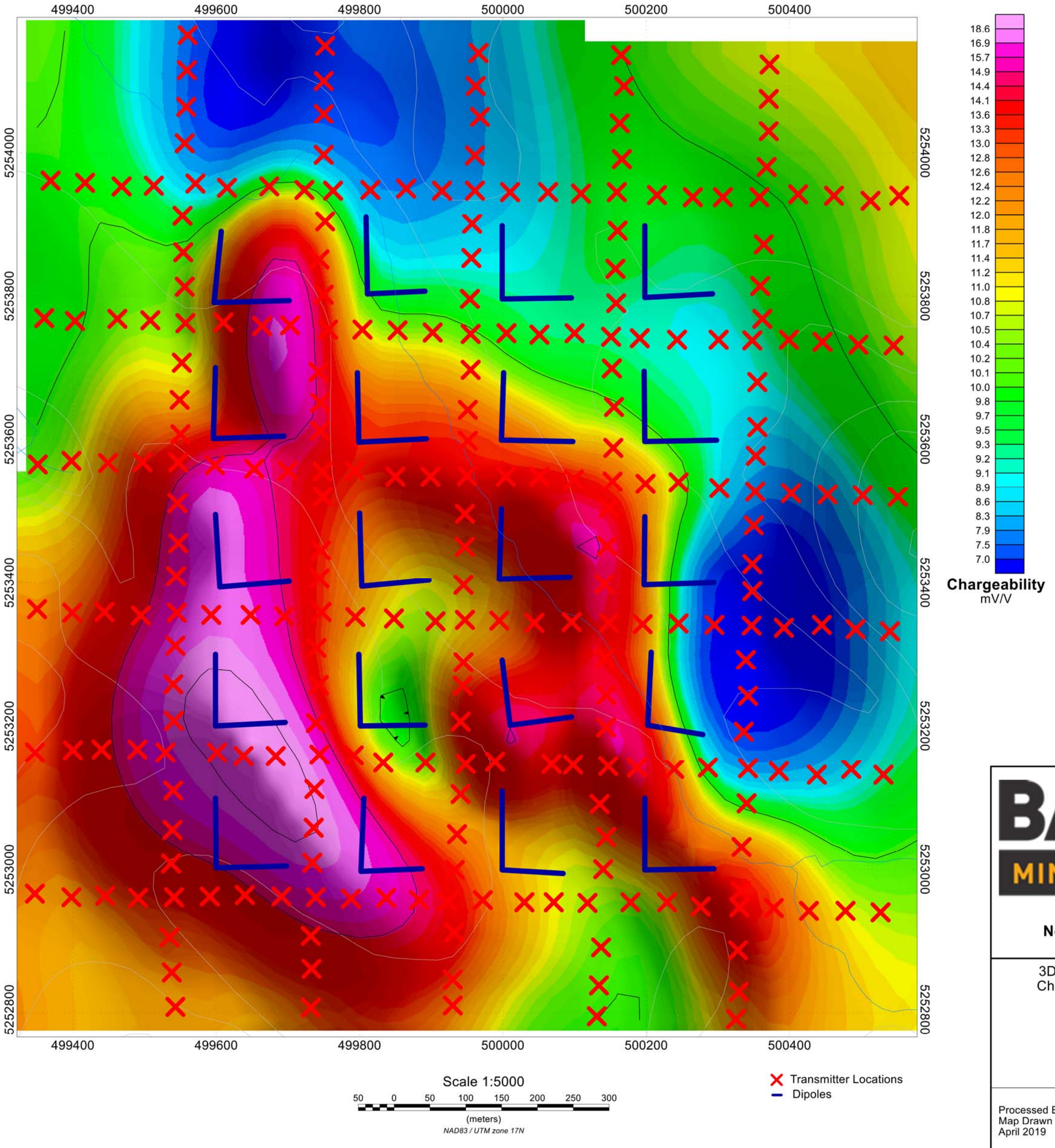
Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-CHR-250MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Chargeability Inversion Slice at 200m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 mV/V

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

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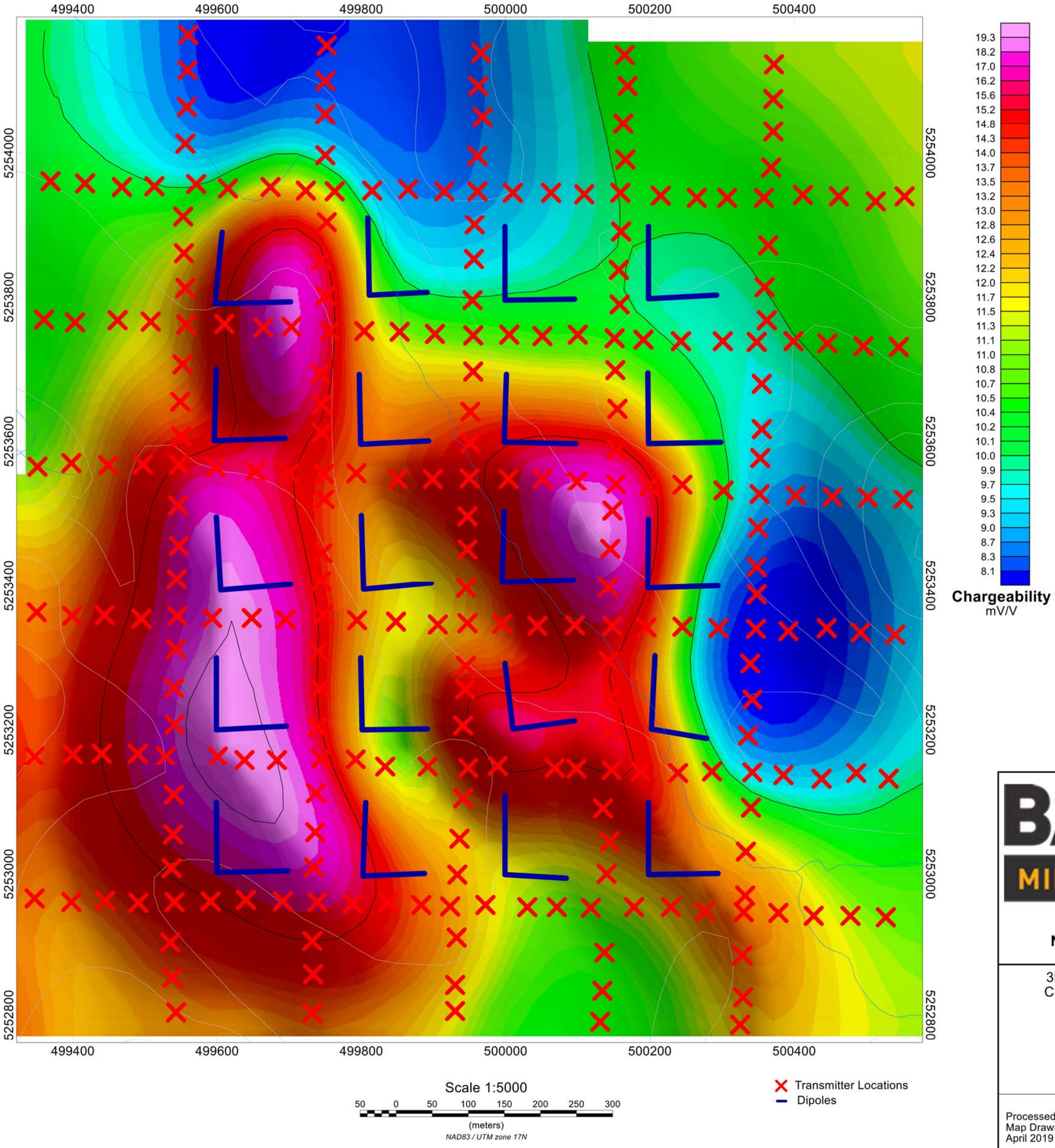
Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-CHR-200MSL



BATTERY MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Chargeability Inversion Slice at 150m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 mV/V

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

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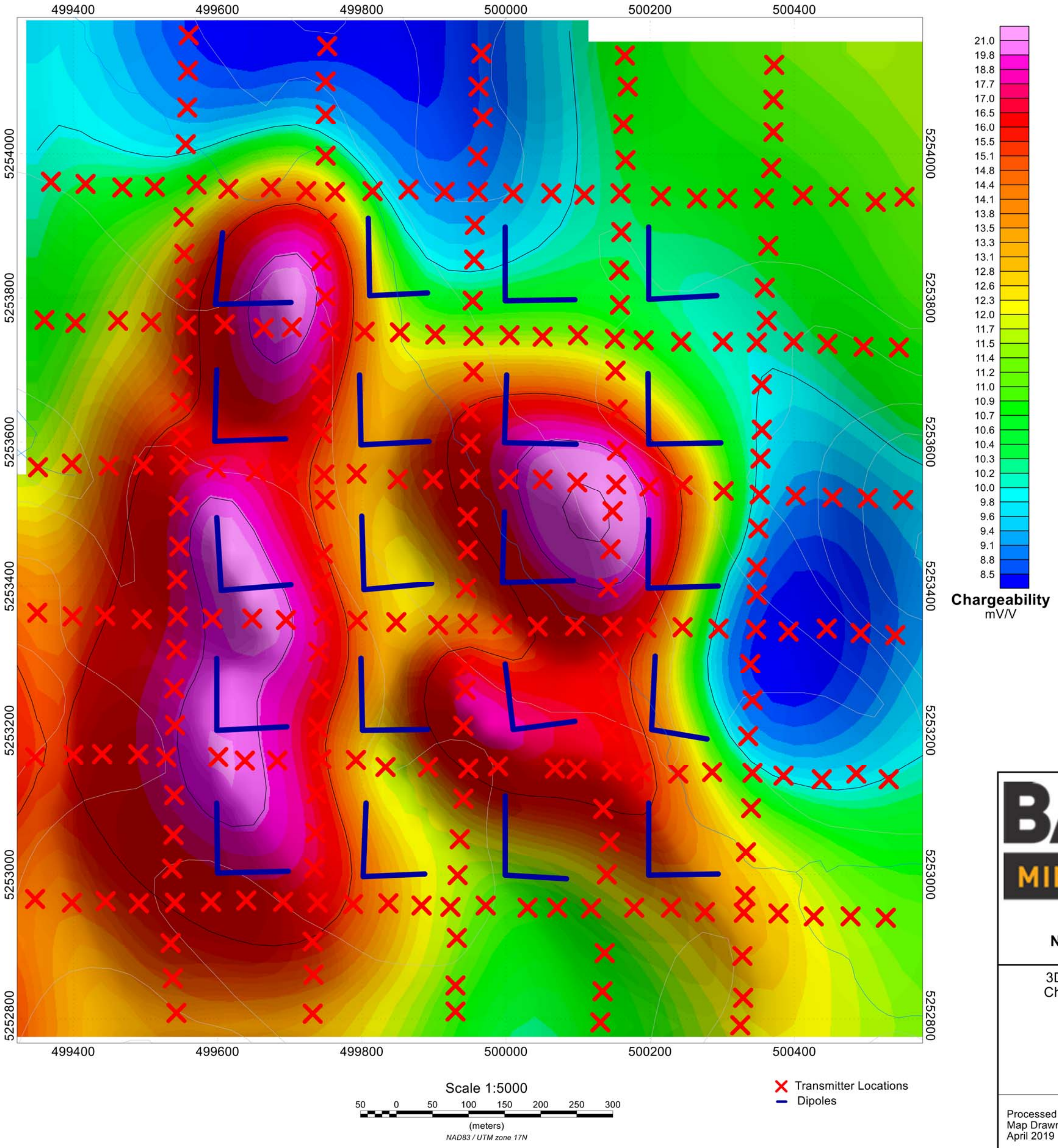
Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-CHR-150MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Chargeability Inversion Slice at 100m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 mV/V

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

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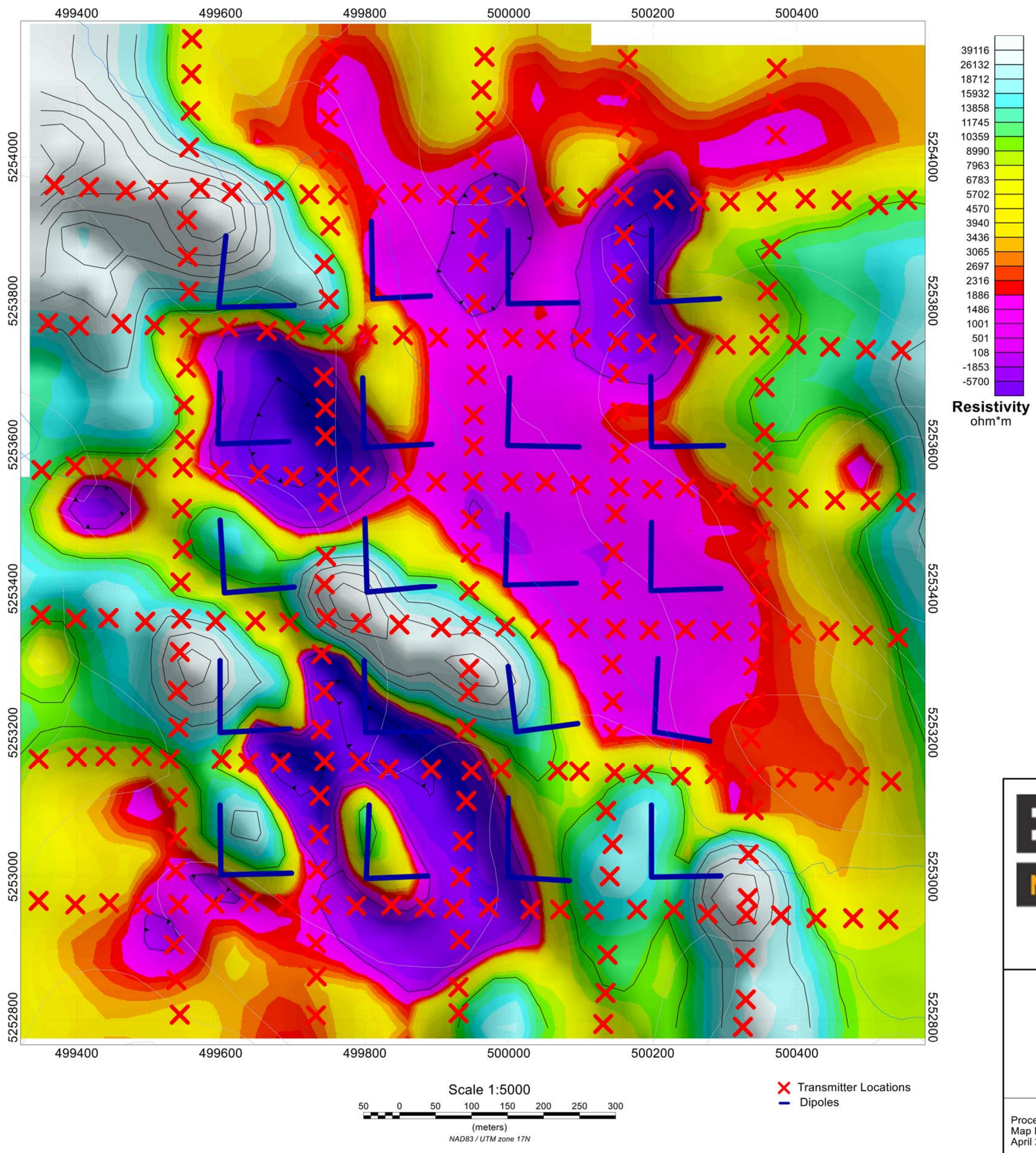
Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-CHR-100MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Resistivity Inversion Slice at 450m MSL

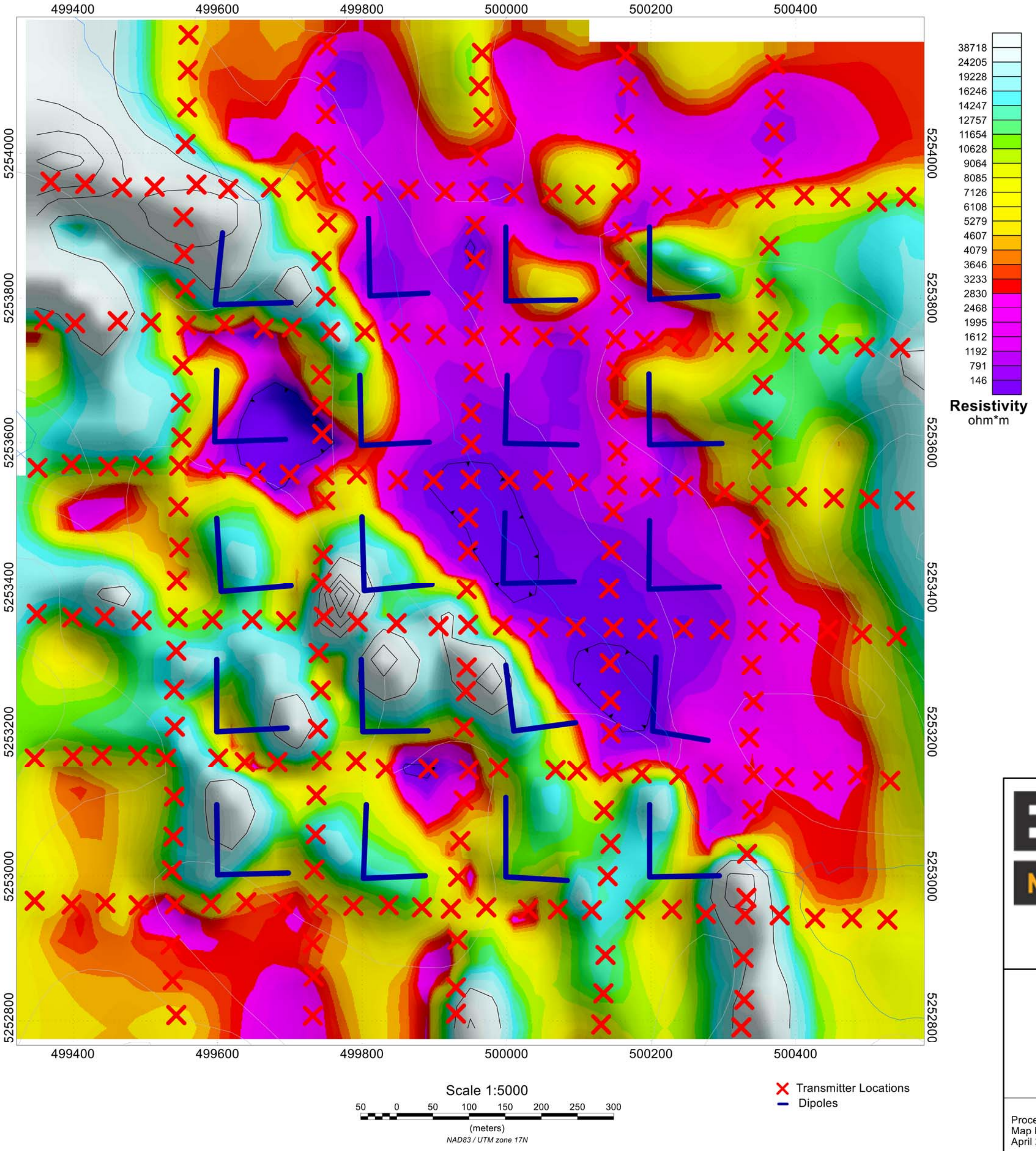
Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 10 000 ohm*m

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS
CANADIAN EXPLORATION SERVICES LTD

Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-RES-450MSL



BATTERY MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Resistivity Inversion Slice at 400m MSL

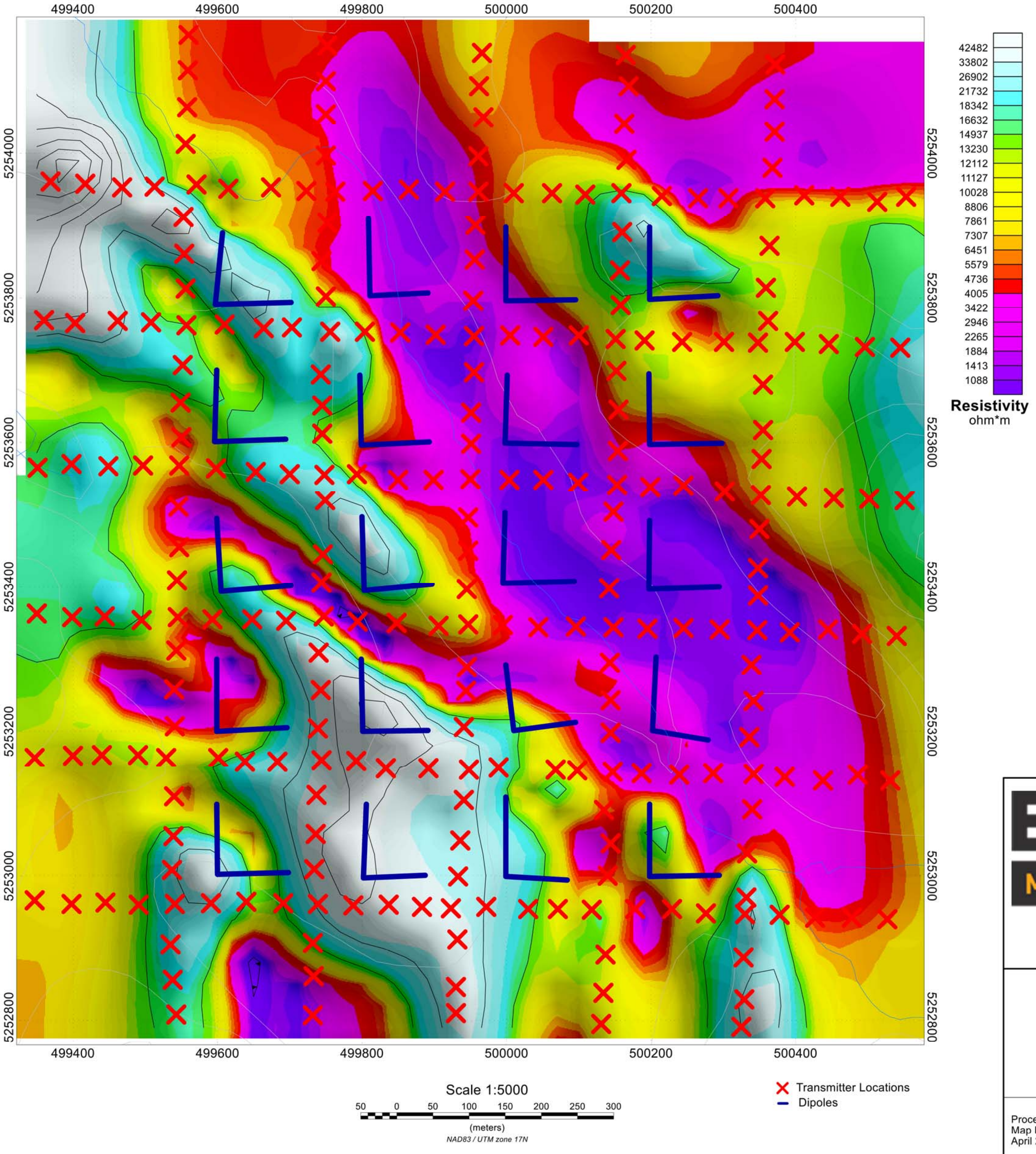
Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 25 000 ohm*m

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS CANADIAN EXPLORATION SERVICES LTD

Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-RES-400MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Resistivity Inversion Slice at 350m MSL

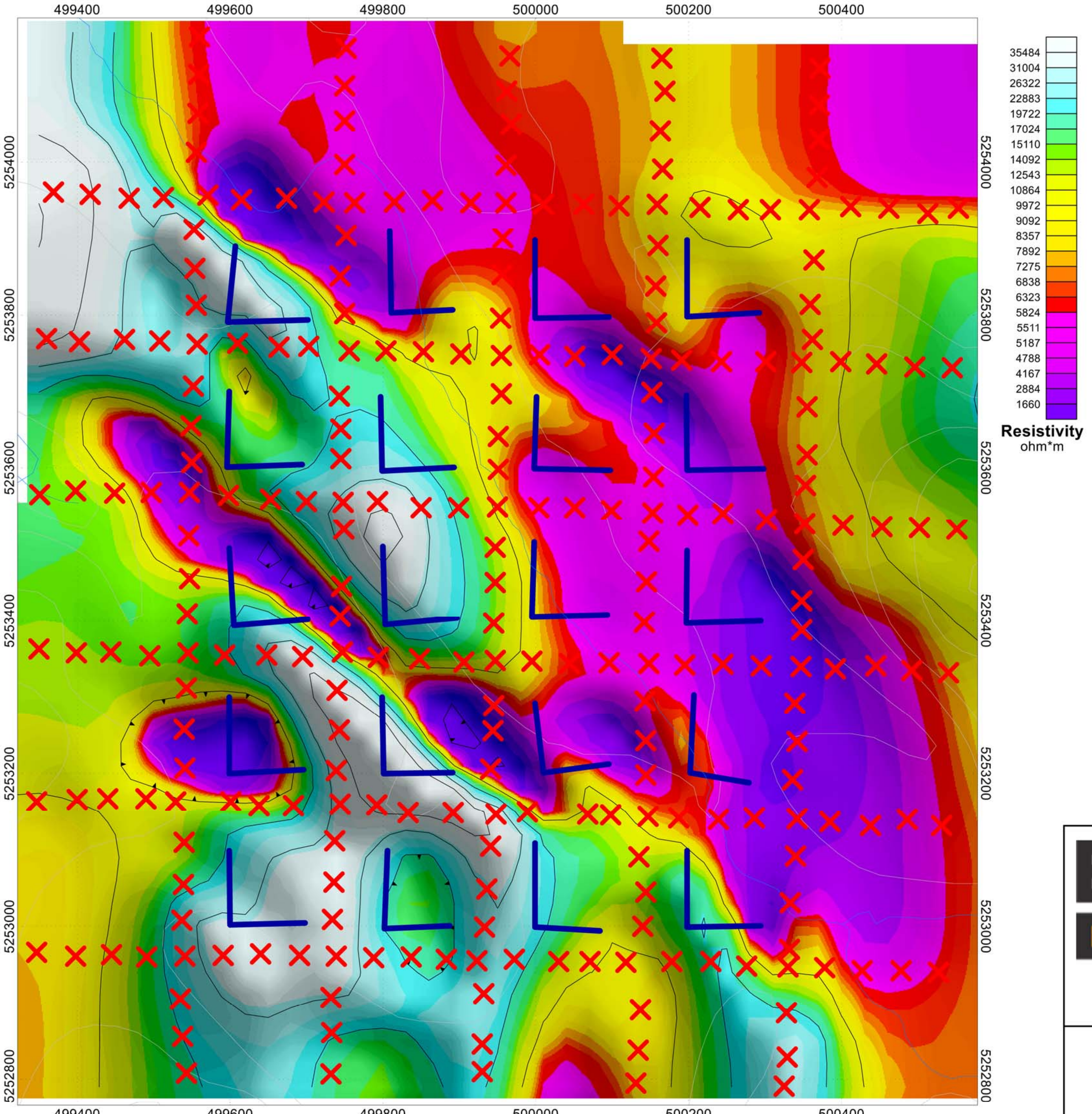
Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 15 000 ohm*m

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS
CANADIAN EXPLORATION SERVICES LTD

Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-RES-350MSL



Scale 1:5000

50 0 50 100 150 200 250 300

(meters)

NAD83 / UTM zone 17N

✕ Transmitter Locations

— Dipoles

BATTERY MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Resistivity Inversion Slice at 300m MSL

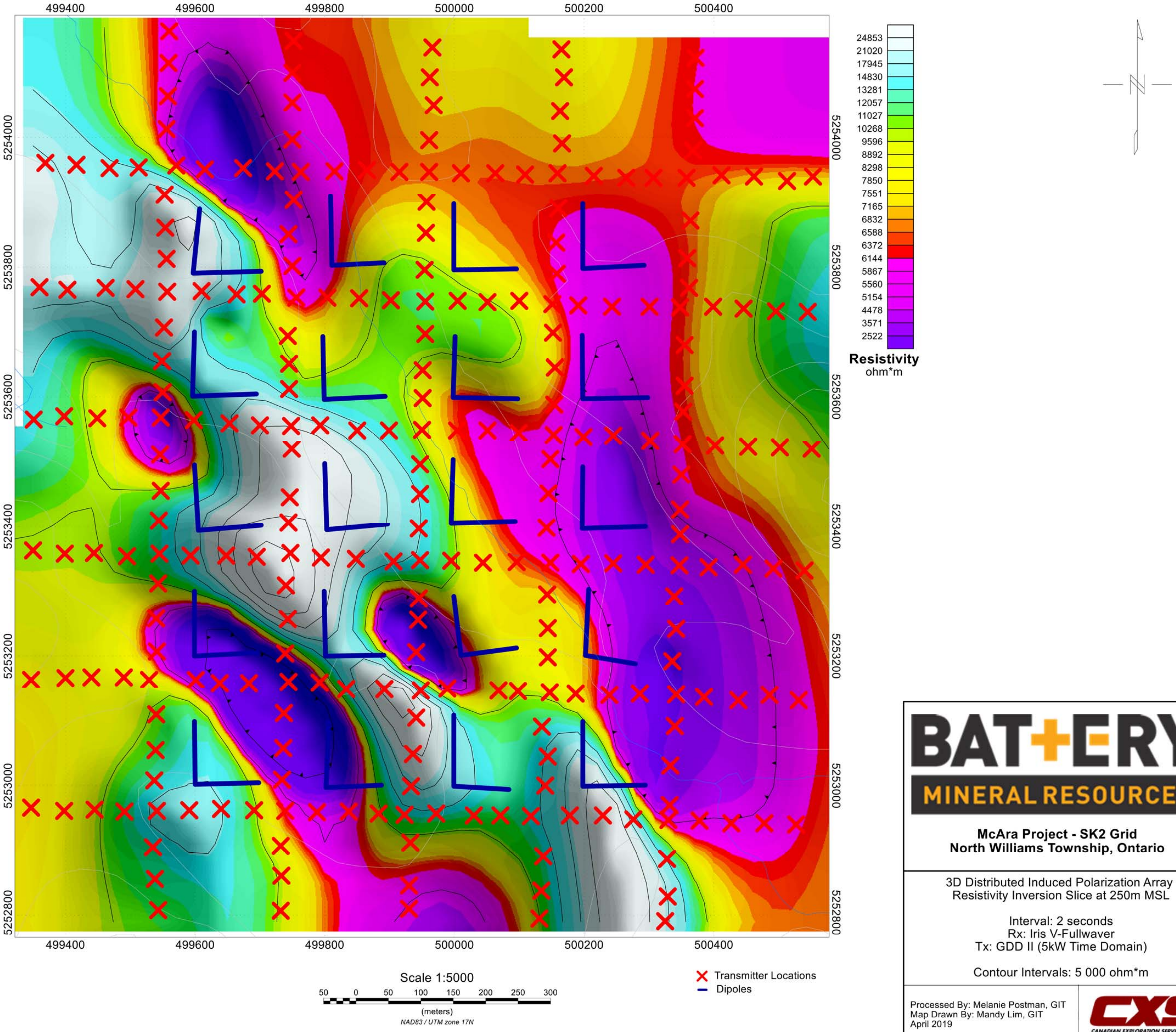
Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 10 000 ohm*m

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS
CANADIAN EXPLORATION SERVICES LTD

Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-RES-300MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Resistivity Inversion Slice at 250m MSL

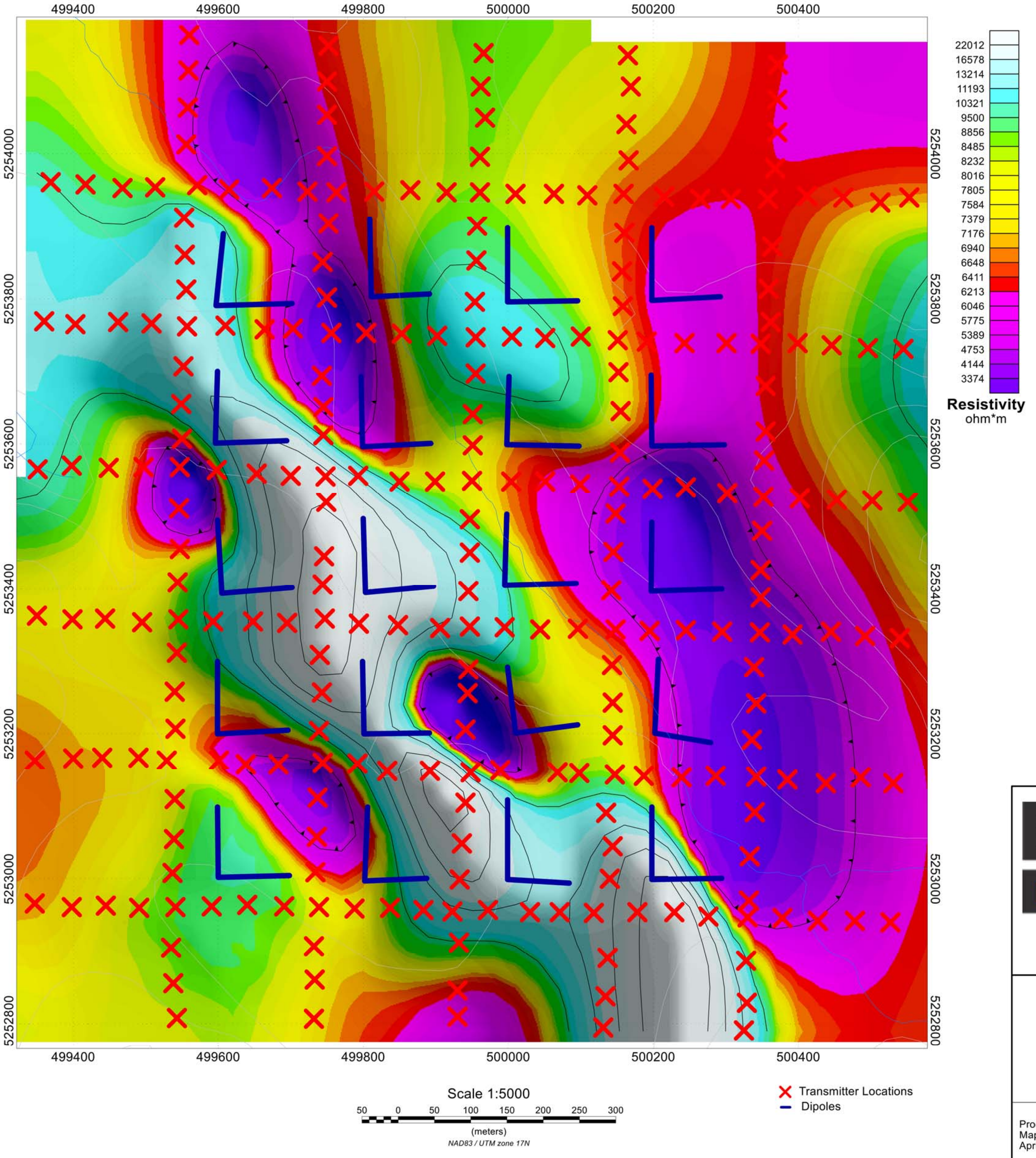
Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 000 ohm*m

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS
CANADIAN EXPLORATION SERVICES LTD

Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-RES-250MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Resistivity Inversion Slice at 200m MSL

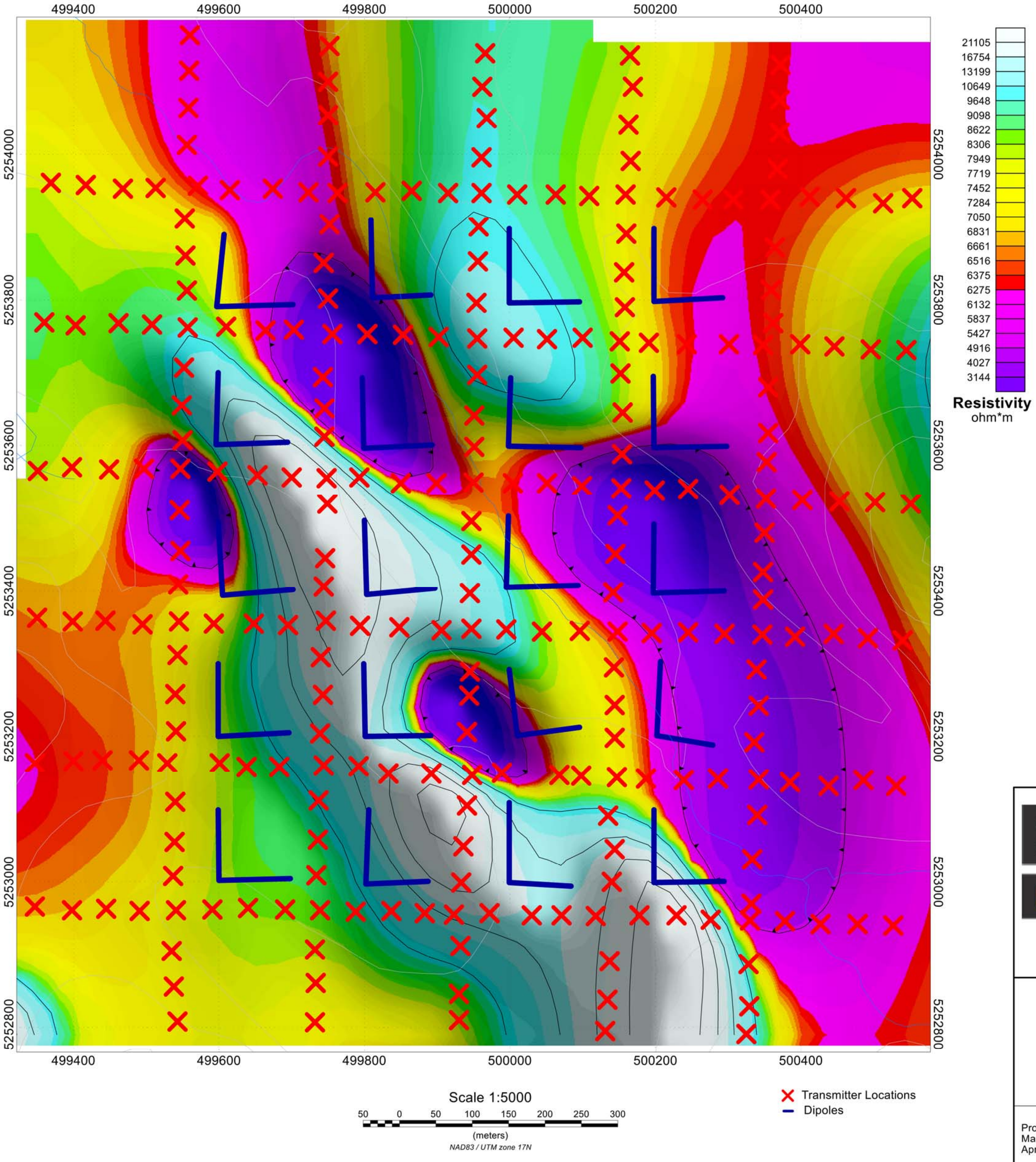
Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 000 ohm*m

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS
CANADIAN EXPLORATION SERVICES LTD

Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-RES-200MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Resistivity Inversion Slice at 150m MSL

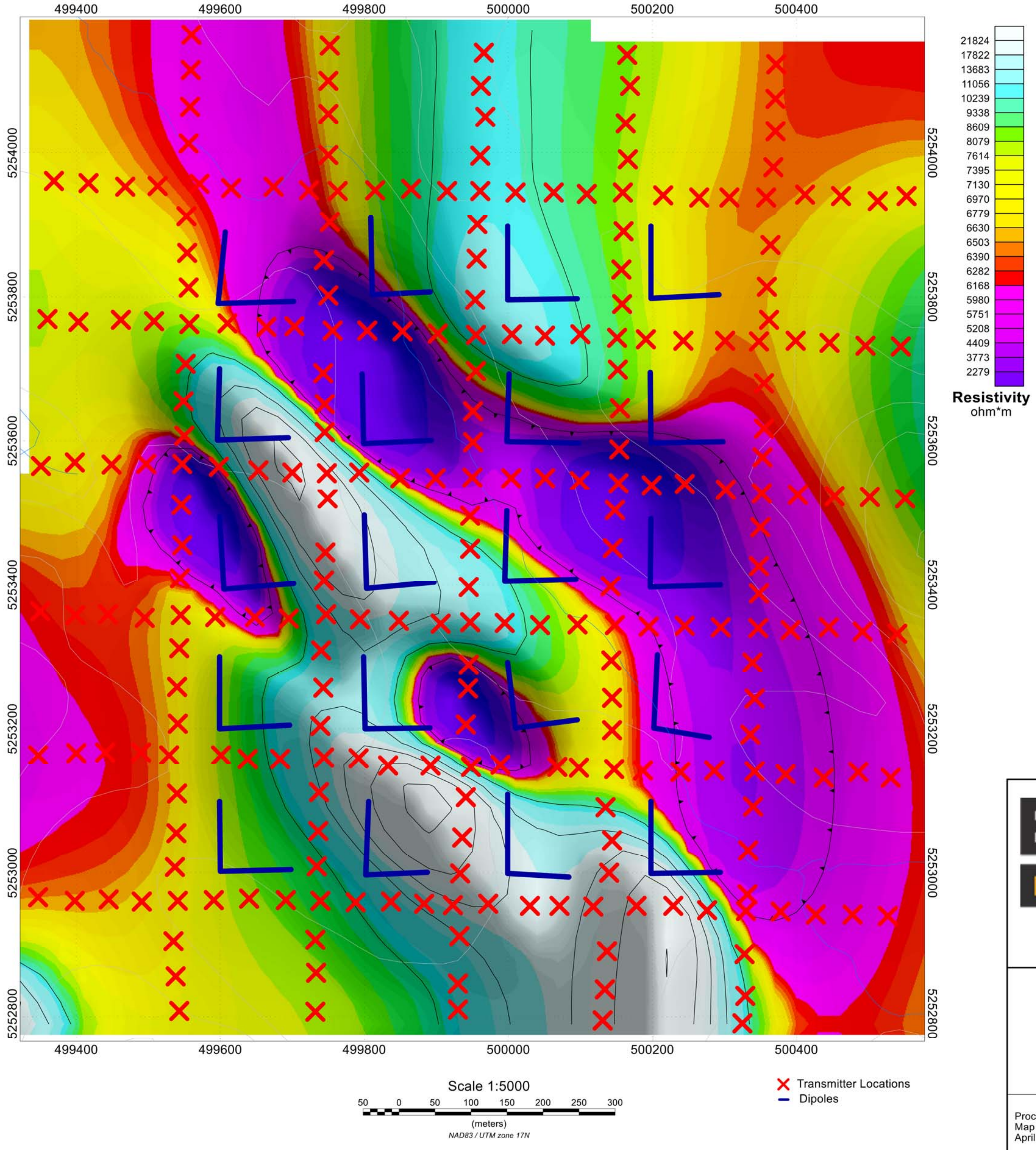
Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5 000 ohm*m

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS
CANADIAN EXPLORATION SERVICES LTD

Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-RES-150MSL



BATTERY
MINERAL RESOURCES

McAra Project - SK2 Grid
North Williams Township, Ontario

3D Distributed Induced Polarization Array
Resistivity Inversion Slice at 100m MSL

Interval: 2 seconds
Rx: Iris V-Fullwaver
Tx: GDD II (5kW Time Domain)

Contour Intervals: 5000 ohm*m

Processed By: Melanie Postman, GIT
Map Drawn By: Mandy Lim, GIT
April 2019

CXS
CANADIAN EXPLORATION SERVICES LTD

Drawing: Q2610-Battery-McAra-SK2-3DIP-INV-RES-100MSL