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2D Resistivity and Magnetometer Geophysical Surveys for Placer Prospecting on Dolly Creek, Yukon

Surveys and Assessment Report prepared for:

Bonnie (Marlene) Crawford

Whitehorse Mining District Placer Claims

P 42029, P 42030, P 42031, P 42032, P 42033, P 42034, P 42035

NTS MAPSHEET 115i03 (Mount Nansen)

Location (UTM): 384127 6883550

OWNER: Bonnie (Marlene) Crawford

CONSULTANT: Arctic Geophysics Inc.

PO Box 31441 RPO Main St, Whitehorse, YT, Y1A 6K8

AUTHORS: Stefan Ostermaier, Arctic Geophysics Inc.

David Storm, Arctic Geophysics Inc.

DATE SUBMITTED: November 13th, 2017

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1. Location and Access

This geophysical investigation, using 2D Resistivity and magnetometer, was done at Dolly Creek for Bonnie (Marlene) Crawford.

Geophysics work was conducted to prospect the ground for placer mining interests. The program was focused on measuring and interpreting the following subsurface characteristics:

- Depth and topography of bedrock
- Stratigraphy of surficial sediments
- Location, size, and geometry of benches
- Identifying recent near surface channels (Mag)

The resistivity survey consisted of three survey lines (235m, 315m, 395m) done on August 12th, 13th, and 14th. Magnetometer work was carried out on August 15th, 16th, and 17th, 2017.

The survey area is located in the Whitehorse Mining District of Yukon, 50km west of Carmacks

The survey area was reached by Mount Nansen Road from Carmacks

List of claims

Tenure Number	Claim Name	Claim Owner
P 42029	Claim 1	Bonnie Crawford – 50% Merchant 2000 – 50%
P 42030	Claim 2	Bonnie Crawford – 50% Merchant 2000 – 50%
P 42031	Claim 3	Bonnie Crawford – 50% Merchant 2000 – 50%
P 42032	Claim 4	Bonnie Crawford – 50% Merchant 2000 – 50%
P 42033	Claim 5	Bonnie Crawford – 50% Merchant 2000 – 50%
P 42034	Claim 6	Bonnie Crawford – 50% Merchant 2000 – 50%
P 42035	Claim 7	Bonnie Crawford – 50% Merchant 2000 – 50%

2. Crew

Resistivity crew: David Storm and Matthew Grant, Arctic Geophysics Inc.

Magnetometer crew: David Storm and Matthew Grant, Arctic Geophysics Inc.

Support, Documentation: Heidi Kulcheski, Arctic Geophysics Inc.

Line planning: Bonnie Crawford, Arctic Geophysics Inc.

3. Fieldwork – Schedule

Fieldwork: The resistivity survey was conducted on August 12th - 14th, 2017. The magnetometer survey was conducted on August 15th-17th , 2017.

Processing, Interpretation, First Documentation: Resistivity data on August 12th , 2017; Magnetometer data on August 18th, 2017.

4. Geophysical Methods

4.1 Resistivity

Resistivity is a material property that measures how strongly a material opposes the flow of electric current. The purpose of a resistivity survey is to measure the distribution of resistance in the subsurface material. The resistance of earth materials is related to mineral species, fluid content, porosity, and degree of water saturation. Resistivity measurements are commonly performed by injecting current through the ground with two current electrodes and measuring the resultant voltage difference between two potential electrodes. The equipment used is designed to measure layer interfaces in depths from 1m to 100m by varying the spacing between electrodes.

Resistivity/IP measurement, Stefan Ostermaier, Arctic Geophysics Inc., Atlin, BC 2013

4.2 Induced Polarization

One way to measure IP is to inject direct current into the soil. The induced polarization of the ground materials are the result of electrochemical processes. When the current is turned off it takes time for the induced voltage to decay. The rate of decay characterises certain minerals. Sulfides (for example pyrite) result in a strong signal while clay-like minerals result in a weak signal. The equipment used for IP is the same as resistivity with the same geometry and depth penetration. The IP measurements are taken in conjunction with resistivity measurements.

4.3 Magnetometer

A magnetometer survey measures the total magnetic field anomaly in the area of interest. Geological units with relatively high total field strength are likely to contain higher concentrations of ferrimagnetic minerals. By far the most common of these is magnetite, which has a specific gravity of 5.2 g/cm3. With its high density magnetite settles on stream beds to form black sands. Black sands are expected to be associated with heavy minerals, including gold. Total magnetic field is measured in nanoTesla (nT).

5. Use of Geophysical Method

5.1.1 Resistivity/IP Instrumentation

For this survey a lightweight, custom-built 2D RESISTIVITY imaging system with rapid data acquisition was used. The system includes:

“4 POINT LIGHT” EARTH RESISTIVITY METER

128 ELECTRODE CONTROL MODULES[1]

128 STAINLESS STEEL ELECTRODES

640m MULTICORE CABLE: CONNECTOR SPACING: 5m

This system weighs approximately 120 kg which is about one third of regular standard equipment. It can be run with a 12V lead battery. The equipment facilitates high mobility and rapid data acquisition with a small crew.

5.1.2 Magnetometer Instrumentation

The equipment used includes:

GEMSYS GSM-19 GW (rover)

Handheld Garmin GPSMAP 64s

GEMSYS GSM-19 (base)

[1] of which a maximum of 80 were used

5.2.1 Resistivity/IP Data Acquisition

The data acquisition is carried out by the automatic activation of 4-point-electrodes. Several thousand measurements are taken, one every 1-2 seconds. The AC transmitter current of 0.26 to 30 Hz is amplified by the electrode control modules, up to a maximum of 100mA and 400V peak to peak. The voltage measured at the receiver electrodes (M, N) is also amplified. In this resistivity survey the Wenner-Schlumberger-array was used. The Wenner-Schlumberger array is appropriate to image horizontal layers and is ideal for placer prospecting.

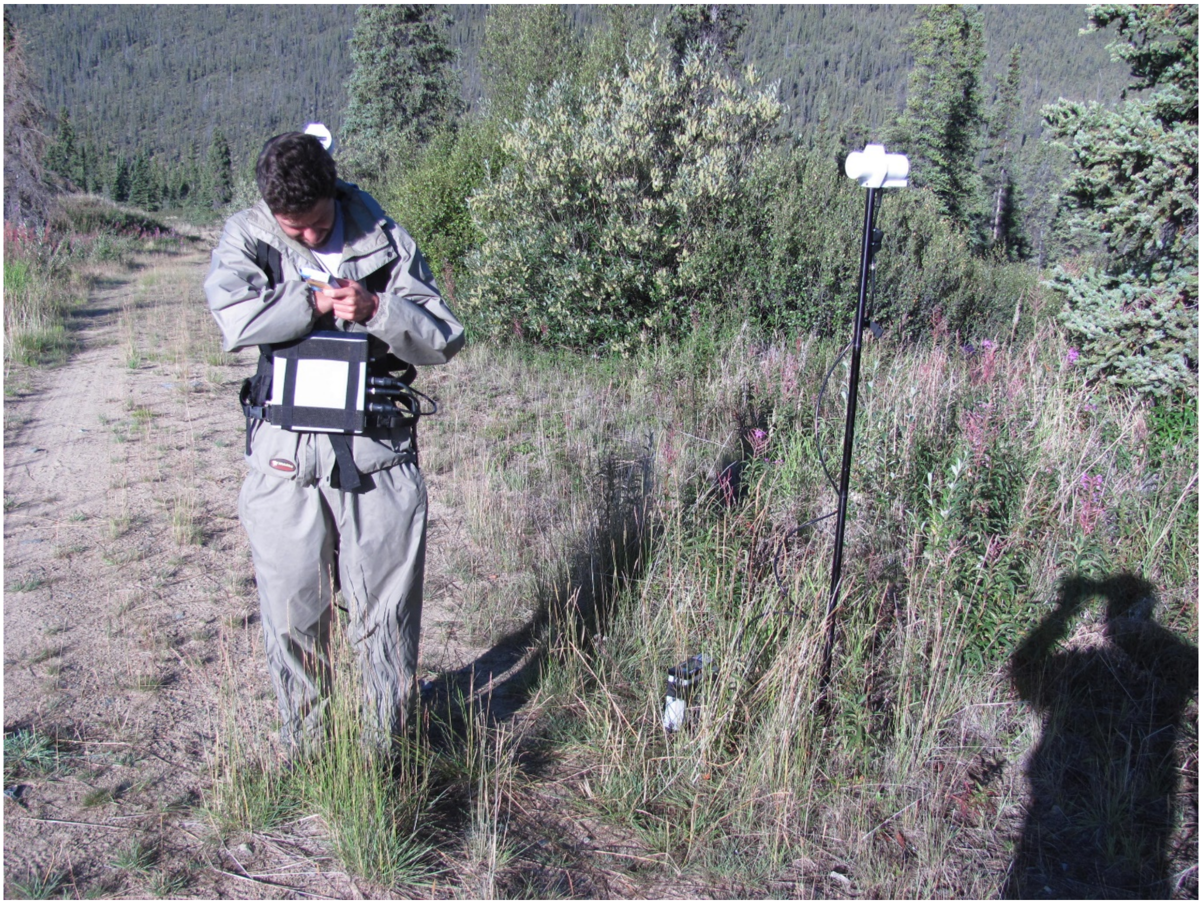
The 2D Resistivity imaging system used for this survey, allows measurements with a depth of up to 80-100m. An electrode spacing of 5m was used, resulting in a horizontal measuring resolution of 2.5m. This spacing has proven itself reliable in the determination of bedrock topography and sedimentary stratigraphy for placer investigation under most environmental conditions.

5.2.2 Magnetometer Data Acquisition

The GEMSYS GSM-19 was used as a base station. It was set in exactly the same location on both survey days with the sensor coil positioned perpendicular to magnetic north. The cycling time (time between measurements) for the base station was set to 4s.

The GEMSYS GSM-19 GW set to walking mode was used as the “rover” magnetometer. The time was synced between the base station and rover using a 6 pin connector cable. The cycling time for the rover was set to 1s.

The endpoints for each of the 36 survey lines were programmed into the Garmin GPS. Lines were positioned 25m apart and ran perpendicular along an azimuth of 76.45°. The first line was 409m long and centred at 137.216W, 62.064N. The subsequent 35 lines were 409m long, parallel to the first line. The survey ran north east of the first line. In order to minimize noise, efforts were made to remove all magnetic items from the operator.



Magnetometer Survey – Dolly Creek – photo taken August 2017 --The rover magnetometer is strapped to the operator's chest and the sensor coil is above his head.

5.3.1 Resistivity/IP Data Processing

The measured Resistivity data were processed with the RES2DINV inversion program.

5.3.2 Magnetometer Data Processing

The magnetometer data was processed with GemLink 5.32 to correct for diurnal variation. A datum of 56000 nT was chosen. Data was then checked for outliers with Microsoft Excel. Spatial interpolation of the data was performed with QGIS.

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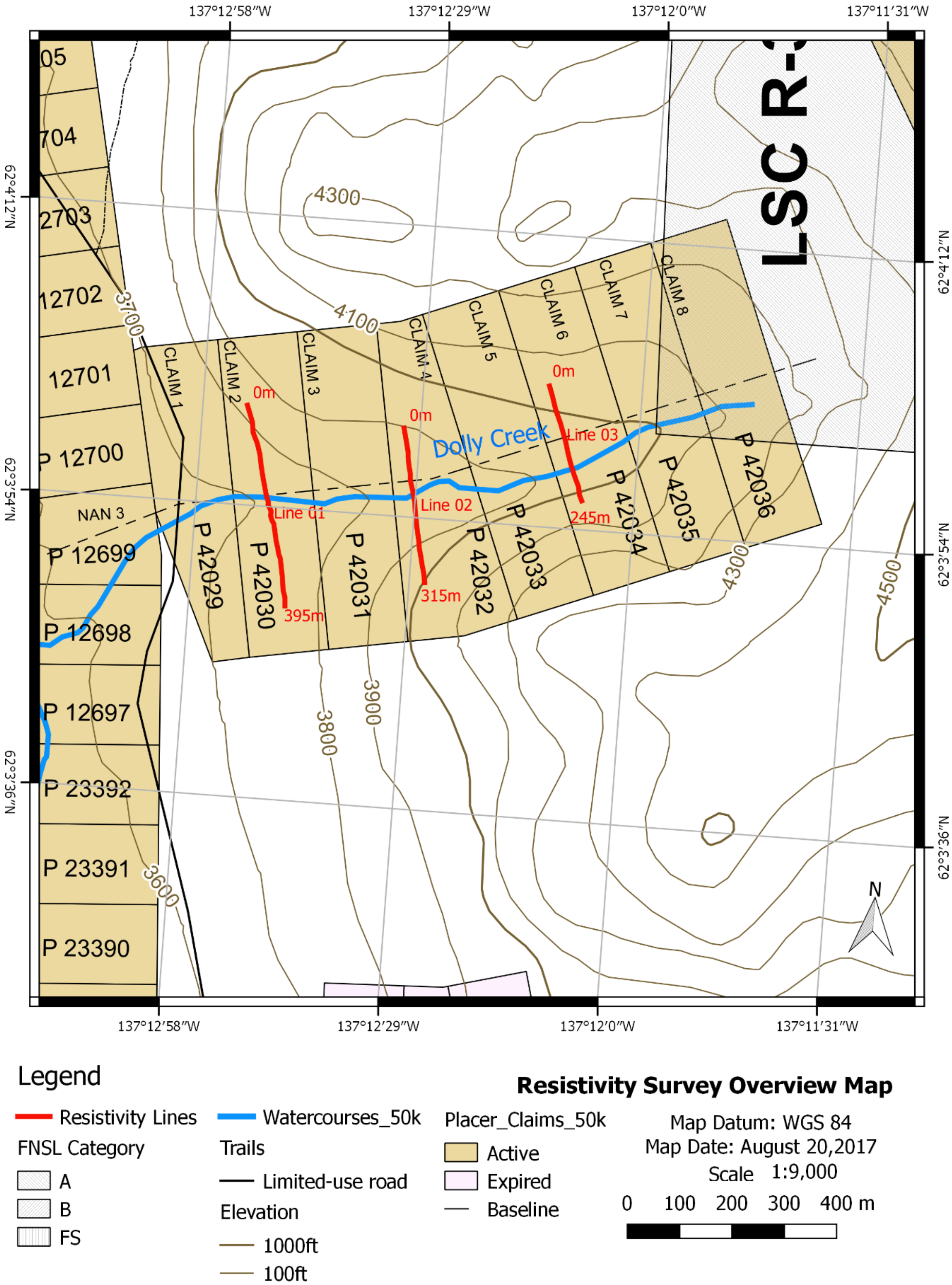
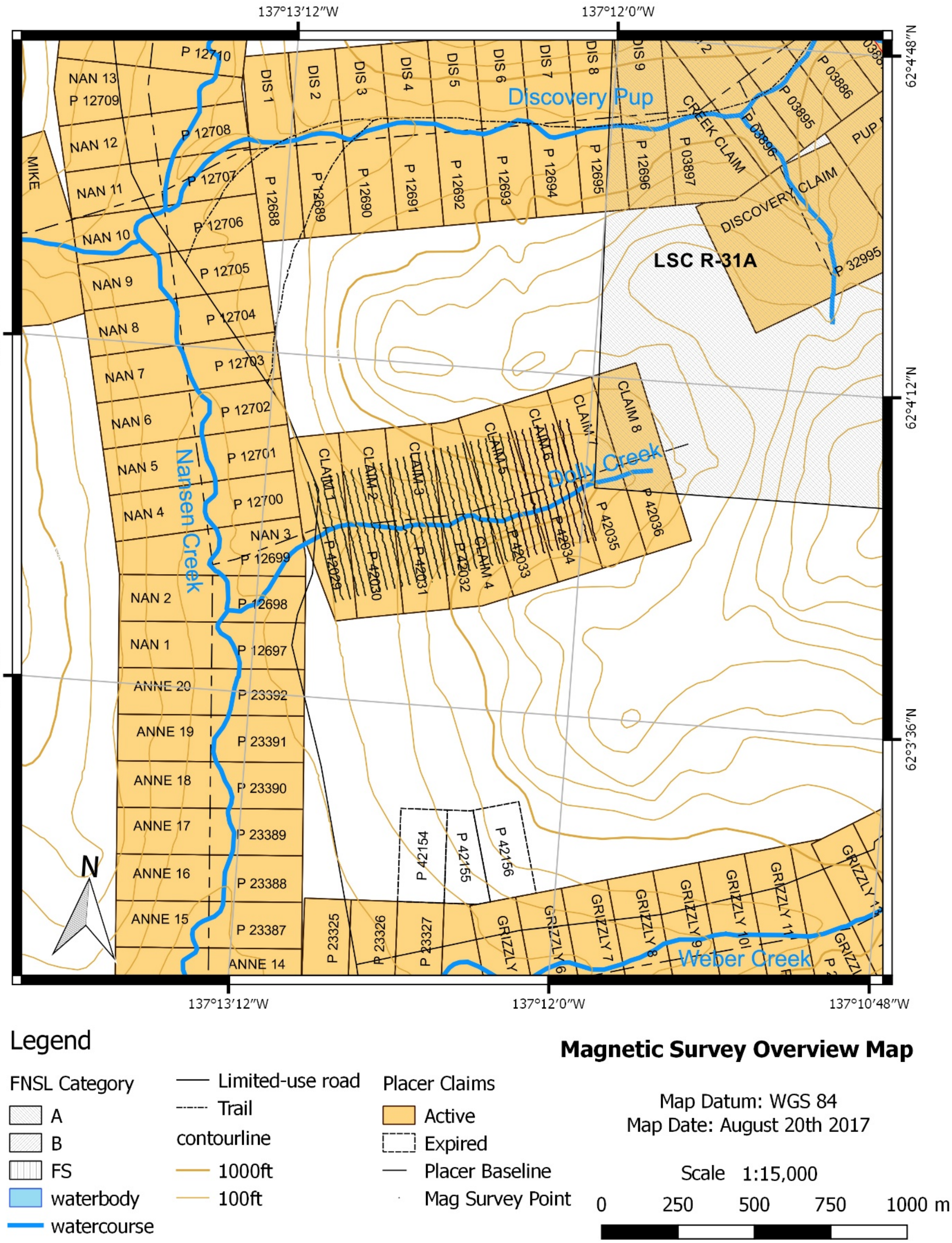
o[2] Produced by GEM Systems (Canada)

6. Survey Map Overview

6.1 Resistivity Survey Map



6.2 Magnetometer Survey Map



7. Profiles and Interpretation

Profile Information

Profile	Line 01	Line 02	Line 03
Resistivity	• 2D Resistivity, Wenner-Schlumberger array • 80 Electrodes: Spacing 5m • Horizontal and vertical measure in [meters],Iteration Error [%] • Vertical exaggeration in model section display: 1.0 • Data Acquisition: David Storm, Matthew Grant 12 August 2017 • Data Processing: David Storm 12 August 2017 • Iteration 7, Abs Error = 2.3	• 2D Resistivity, Wenner-Schlumberger array • 64 Electrodes: Spacing 5m • Horizontal and vertical measure in [meters],Iteration Error [%] • Vertical exaggeration in model section display: 1.0 • Data Acquisition: David Storm, Matthew Grant 13 August 2017 • Data Processing: David Storm 13 August 2017 • Iteration 7, Abs Error = 1.4	• 2D Resistivity, Wenner-Schlumberger array • 48 Electrodes: Spacing 5m • Horizontal and vertical measure in [meters],Iteration Error [%] • Vertical exaggeration in model section display: 0.75 • Data Acquisition: David Storm, Matthew Grant 14 August 2017 • Data Processing: David Storm 14 August 2017 • Iteration 4, Abs Error = 5.3
IP	• 2D IP, Wenner-Schlumberger array • 80 Electrodes: Spacing 5m • Horizontal and vertical measure in [meters],Iteration Error [%] • Vertical exaggeration in model section display: 1.0 • Data Acquisition: David Storm, Matthew Grant 12 August 2017 • Data Processing: David Storm 12 August 2017 • Iteration 7, Abs Error = 1.6	• 2D IP, Dipole-Dipole array • 64 Electrodes: Spacing 5m • Horizontal and vertical measure in [meters],Iteration Error [%] • Vertical exaggeration in model section display: 1.0 • Data Acquisition: David Storm, Matthew Grant 13 August 2017 • Data Processing: David Storm 13 August 2017 • Iteration 7, Abs Error = 2.8	• 2D IP, Dipole-Dipole array • 48 Electrodes: Spacing 5m • Horizontal and vertical measure in [meters],Iteration Error [%] • Vertical exaggeration in model section display: 1.0 • Data Acquisition: David Storm, Matthew Grant 14 August 2017 • Data Processing: David Storm 14 August 2017 • Iteration 7, Abs Error = 1.0

Table 7.1: The information above corresponds with each profile in the report.

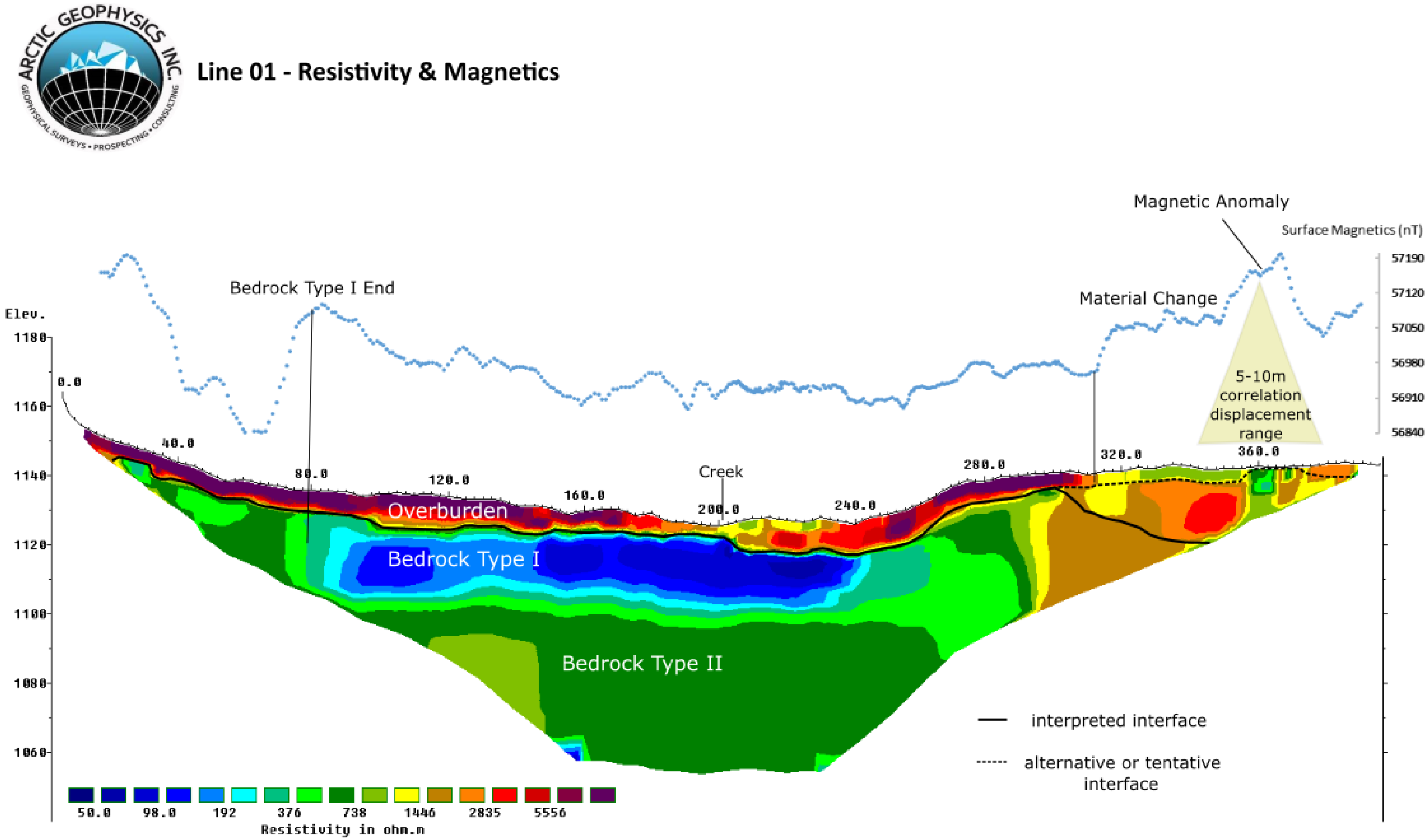
Notes concerning bedrock

Type	Resistivity	IP
Type I	Very low resistivity (blue) with slab like layering, localized north of Dolly Creek	Weak signal usually reading 6-8 mrad(green shades)
Type II	Higher resistivity (light - dark green) underlaying Type I and appears as more of a regional bedrock.	Strong IP Signal, Reading in the 10-15 range(yellow - red).

Table 7.2: There are two types of bedrock in the dolly creek area. The table explains the resistivity and IP signature for each.

Taking Resistivity measurements - Dolly Creek 2017

7.1.1 Resistivity Profile Line 01



This 2D Resistivity measuring result is an interpretation of geophysics data.We recommend the verification of the profile interpretation with test pits, drilling, or shafting

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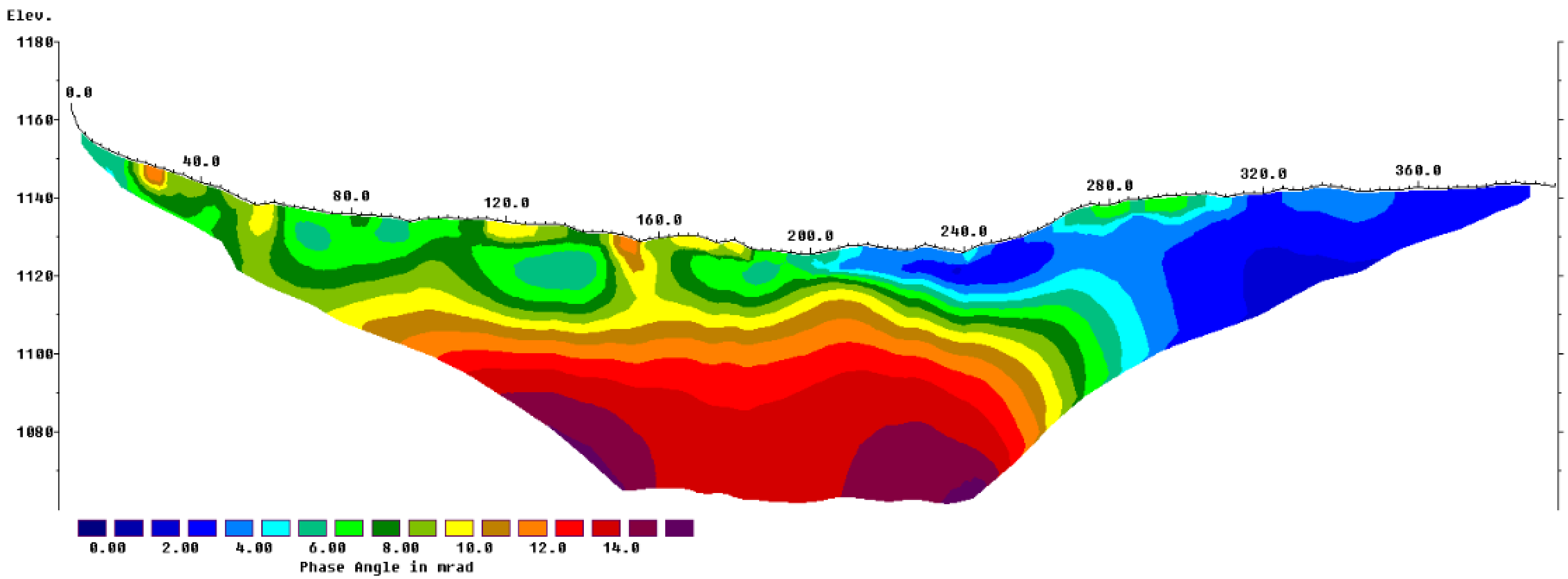
7.1.2 IP Survey Line 01

Line 01 - Induced Polarization



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7.1.2 Interpretation: Line 01

The Line 01 Resistivity Survey has an overburden layer across most of the profile with a thickness ranging from 5-10m. There is 20m thick layer of Type I bedrock from 80 – 240m at a depth of 10m overlaying the Type II bedrock (see Table 7.2). The IP profile is used to help distinguish between overburden (darker blues - greens) and bedrock(green – red). This came in handy on the south slope (right side) where possible bedrock resistivity values rise close to that of the overburden.

From 10 – 175m there is a high resistivity layer 3 - 5m thick. The resistivity values are upwards of 10,000 ohm*m (dark red) which correspond with a dry sand and or permafrost. The geology observed in the surrounding area shows very high sand content as well as no permafrost near the surface. This leads us to believe this layer is a dry sand matrix mixed with talus from the slope.

From 175 – 200m the depth of overburden tapers from 7 – 3m, with the low resistivity structure almost outcropping at the current creek. This either suggests that this structure is a ground water saturated sand outcropping at the creek, or more likely bedrock due to observations of jagged eroded bedrock clasts in the creek. This structure is seen in each profile, retaining a higher IP signal (green-yellow) leading us to believe it is bedrock.

From 200 – 240m the overburden becomes 8-10m thick and more heterogeneous. The lower resistivity values (green) imply a change in material, containing more gravels in a silty material as well as higher conducting organic material. The brown and orange structure at 220m is likely to be alluvial gravels in a silt possibly sand matrix overlaying a local dip in bedrock. The channel begins at a depth of 3-5 m and is

about 5-7m thick. A second dip in bedrock at 240 with similar resistivity suggests another alluvial feature extending from the surface to a depth of 10m. Due to the features proximity to the hillside, it is possible to have the predominant high sand content with talus from the hill slope.

The hill slope from 240m-300m has a 5m-7m thick layer of high resistivity overburden. During data acquisition, talus boulders in a sand matrix was felt just beneath the surface. This material is likely to produce the higher resistivity values (reds) displayed in the resistivity profile.

From 300m-395m, the overburden remains 3-5m meters thick. When inserting the electrodes, the material had a more silty clay feel with minimal boulders resulting in the low resistivity values (green).

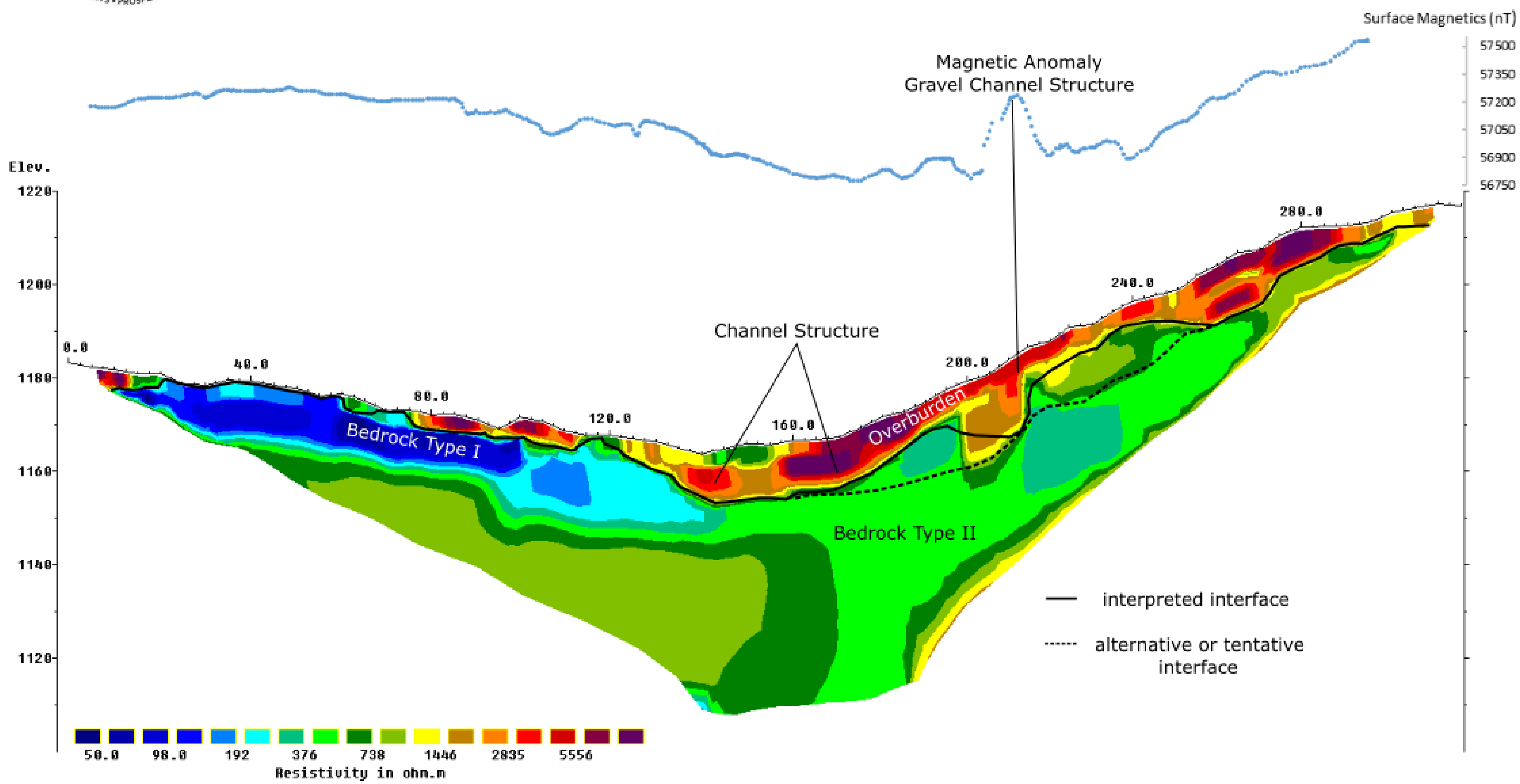
The abrupt vertical change of the low resistive bedrock structure at 240m(change from green-brown), along with a decrease in IP signal(green-blue), explains a drastic change in geologic material. In support of this, trenches dug 100m downstream of the line contained a more clay rich material mixed with cobbles. The resistivity does not show any clear sign of bedrock on or further south of the topographical bench. There is an area of higher resistivity (brown/yellow) at 350m starting at a depth of 3-5m that is about 15m thick. This area has a channel like structure and has a resistivity corresponding to gravels in a clayey silt matrix. This is an area of interest for further exploration.

The magnetic survey results lain overtop of the resistivity profile show two separate anomalies. From 40m-80m there is localized low magnetic readings. This may have to do with Type I bedrock (see Table 7.2) abruptly ending (blue structure at 80m) and possibly having accumulated sediment post erosion. From 320m-395, there is a local high magnetic signature and a shift toward higher resistivity values. This is due to the change in material near the surface. The spike in magnetic values at 365 has few different possible explanations. Due to the slight misalignment of resistivity and magnetic surveys, the readings of magnetic anomalies could be reading the previously described channel structure. The error of magnetic alignment with the resistivity profile is in the range of 5-10m making this structure a plausible cause for the magnetic anomaly. A second interpretation is that Type II bedrock becomes very close to the surface, with an outcrop at 360m. As we will see in following profiles, Type II bedrock tends to have a higher magnetic reading when close to the surface.

Dolly Creek, getting ready for mag survey in cabin

7.2.1 Resistivity Profile Line 02

Line 02 - Resistivity & Magnetics



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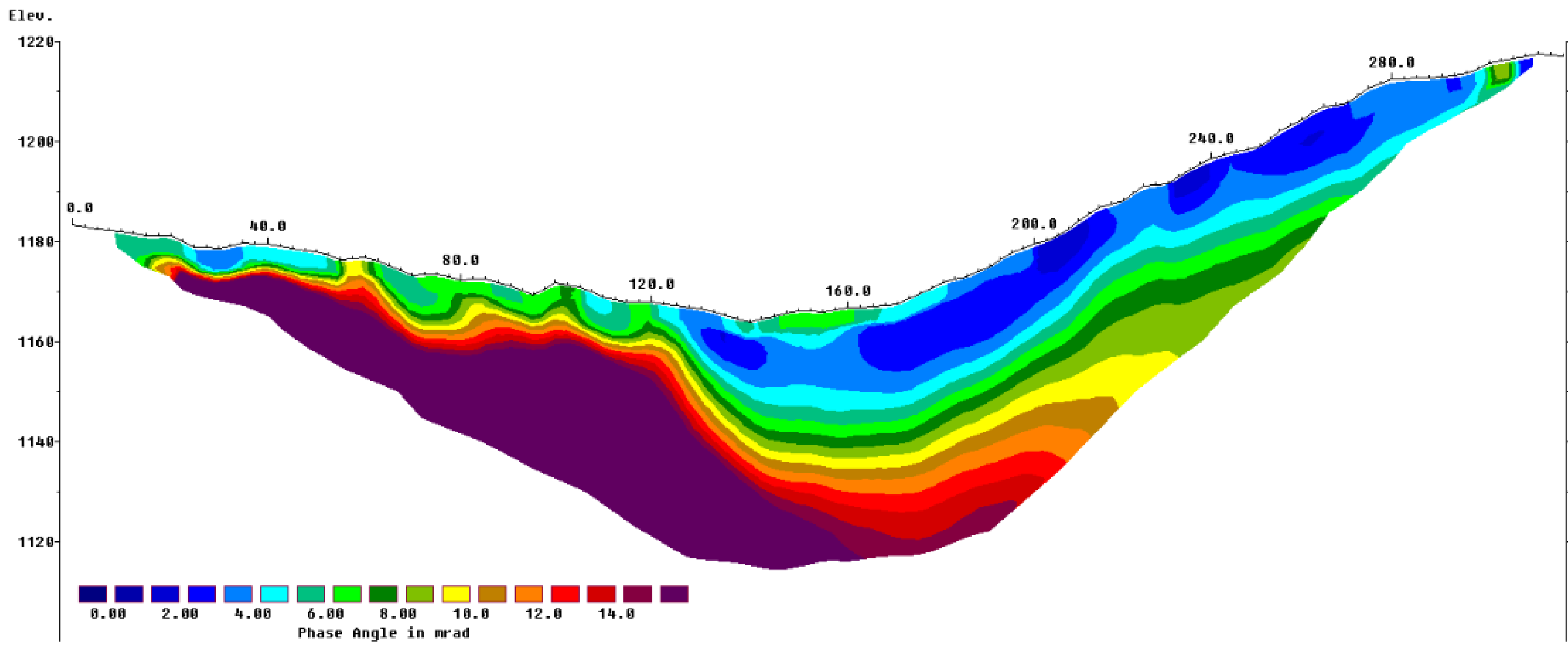
7.2.2 IP Profile Line 02

Line 02 - Induced Polarization



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7.2.3 Interpretation: Line 02

In this profile we have a similar shallow bedrock north of the creek with a change in material and deeper bedrock south of the creek.

From 5m – 75m the previously described low resistivity structure appears at the surface to a depth of about 20m. Observations of the surficial material along the low resistivity structure showed bedrock outcrops along the line. This helps confirm that the low resistivity structure in Line 01 is similarly bedrock versus the alternate interpretation of ground water saturated material.

From 75-130m, the bedrock is very shallow with a 2m-3m sandy overburden (brown – red).

From 130 – 160m, the overburden becomes less resistive and the bedrock layer changes material. We can see the change in resistivity, IP signal and in a decreasing magnetic signature. This material is interpreted as a higher gravel content in a finer sediment matrix. The surface vegetation becomes much thicker near the creek, which also implies a water saturated rich organic layer at the surface attributing to the low resistivity. An interesting high gravel content channel like structure appears at 145m, underneath the current creek, starting at a depth of 5m, continuing to bedrock at a depth of 15m. In the same bedrock dip, a second higher resistivity values is apparent at 165, which could be either filled with hill slope talus, or a mix of boulders, sand, and river gravels. The channel like structure appears at 5m depth, and continues to bedrock at 15m.

From 160m-300m, there is a high resistivity layer 5-10 m thick. This is thought to be similar to Line 01, talus boulders in a sandy matrix.

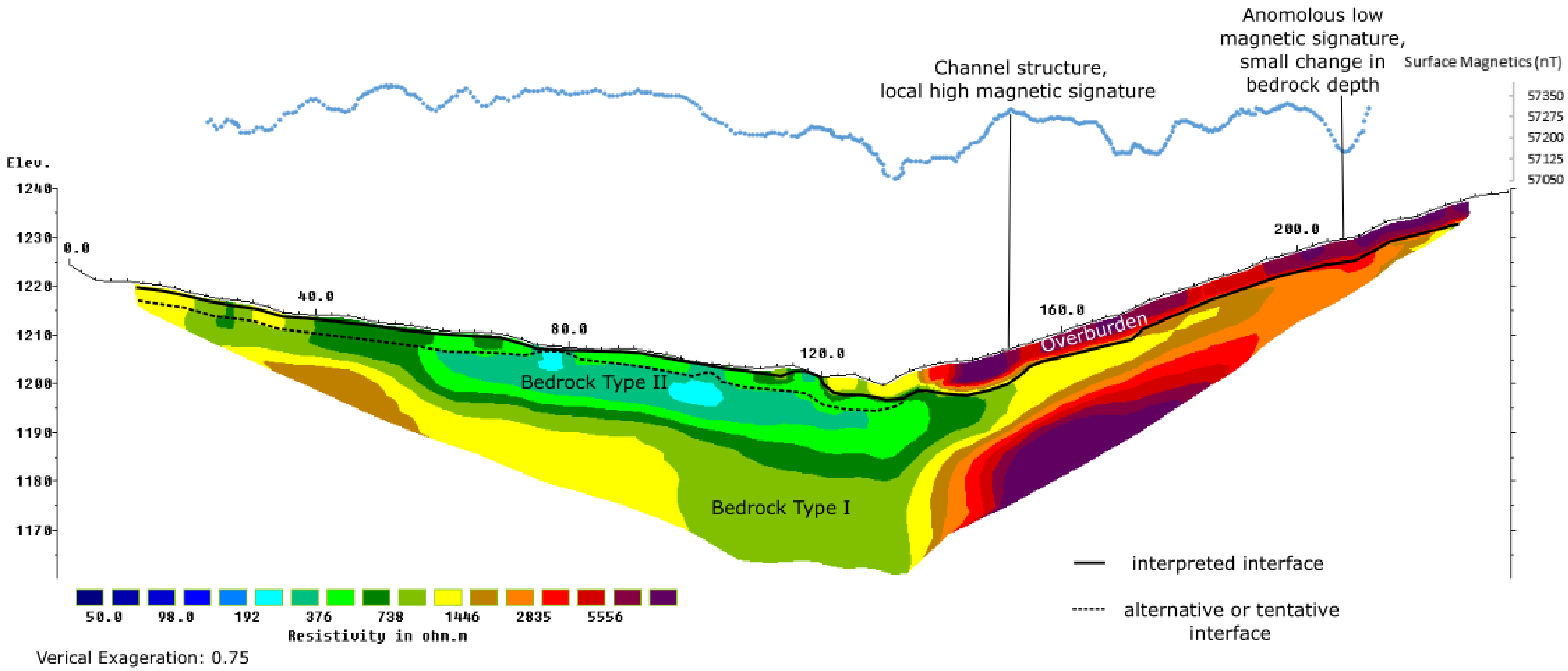
At 210m there is a high resistivity structure starting at 5m depth, extending to bedrock at 15m . There are two possible interpretations for this structure. This could be an old river channel that cross cut the current valley. In support of this we see a similar channel feature in Line 01 at 340m. The magnetic anomaly over the feature helps to suggest that these are areas of interest. From observations we found that the feature in Line 01 is located below one of two subtle benches running southwest off the base of the southern peak. This could be a remnant outwash area during glacial retreat.

A channel like structure is seen at 270m starting at a depth of 8m. This structure is located on top of a second bench outwash feature also running southwest. These bench features along with the structures found in the profile suggest that an old flow system cross cut this valley. Unfortunately the topographic contours are not high enough resolution to confirm these benches on the map, but are visible when on top of the southern slope.

The IP survey from 15m-120m at a depth of 10m-15m has a relatively high IP (10-14mrad). This corresponds to Type II bedrock (see Table 7.2) as seen at a similar depth on the resistivity profile. The lower IP values from the surface to 10m depth are thought to be the result of Type I bedrock overlaying the Type II. The 1-3mrad values (blues) indicate less consolidated material (overburden) along the south slope. These low values are the basis for the alternative interpretation line on the south slope.

7.3.1 Resistivity Profile Line 03

Line 03 - Resistivity & Magnetics



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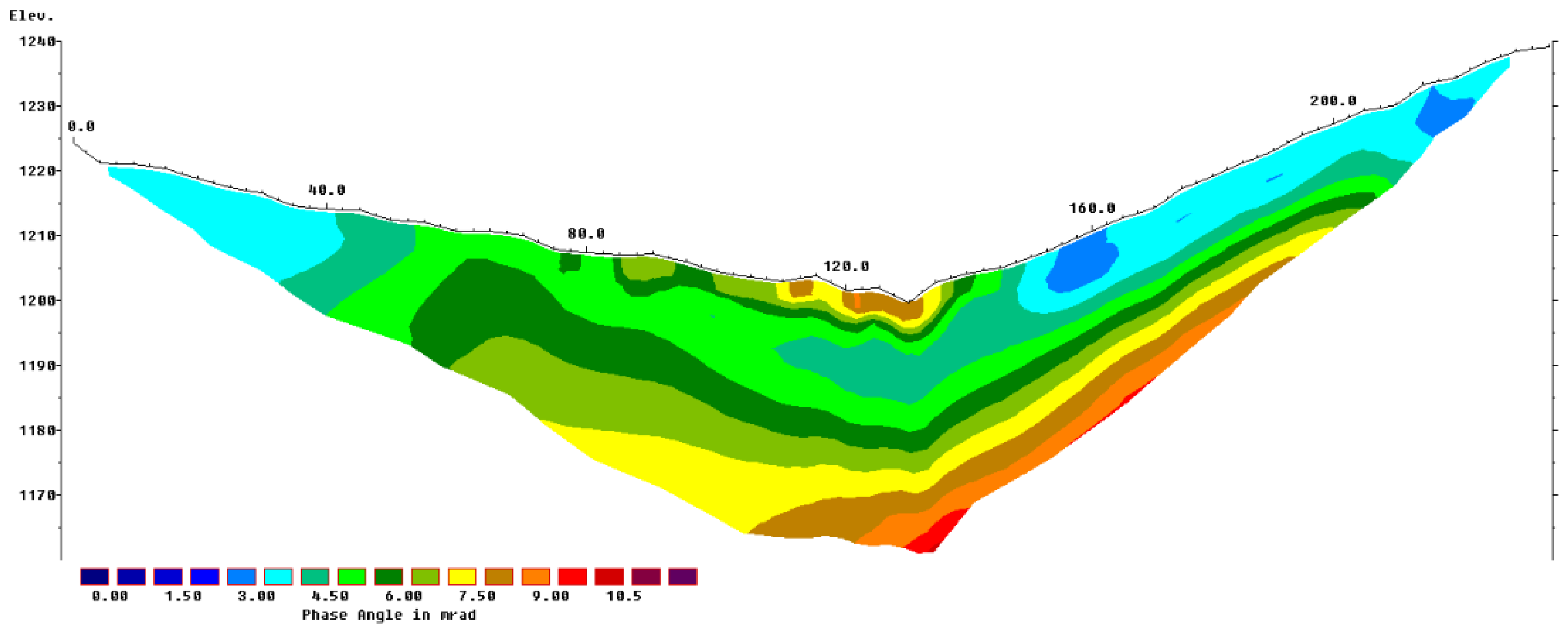
7.3.2 IP Profile Line 03

Line 03 - Induced Polarization



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7.3.3 Interpretation: Line 03

Line 03 starts to show a change in material on the northern slope as well as a better indication of Type II bedrock layer on the southern slope. Type I bedrock (see Table 7.2) appears to be visible in the centre of the profile. The magnetic profile was trimmed at the edges due to very high and very low values affecting the scale and visual representation near the areas of interest (Creek)

From 0-40m there is 5m thick heterogeneous overburden with pockets of high sand content (Yellow/brown). Due to the lower IP values (blues), the overburden could become substantially thicker at this point. There are no signs of channel like features in this area where bedrock possibly drops out.

From 40-70m there is 3m-5m of overburden, less resistive than previous profiles (green). This is interpreted as either bedrock Type I just below the surface or a clayey silt overburden (alternative interface line).

From 70m-110m Type I bedrock appears to raise up close to the surface where visual outcrops were observed.

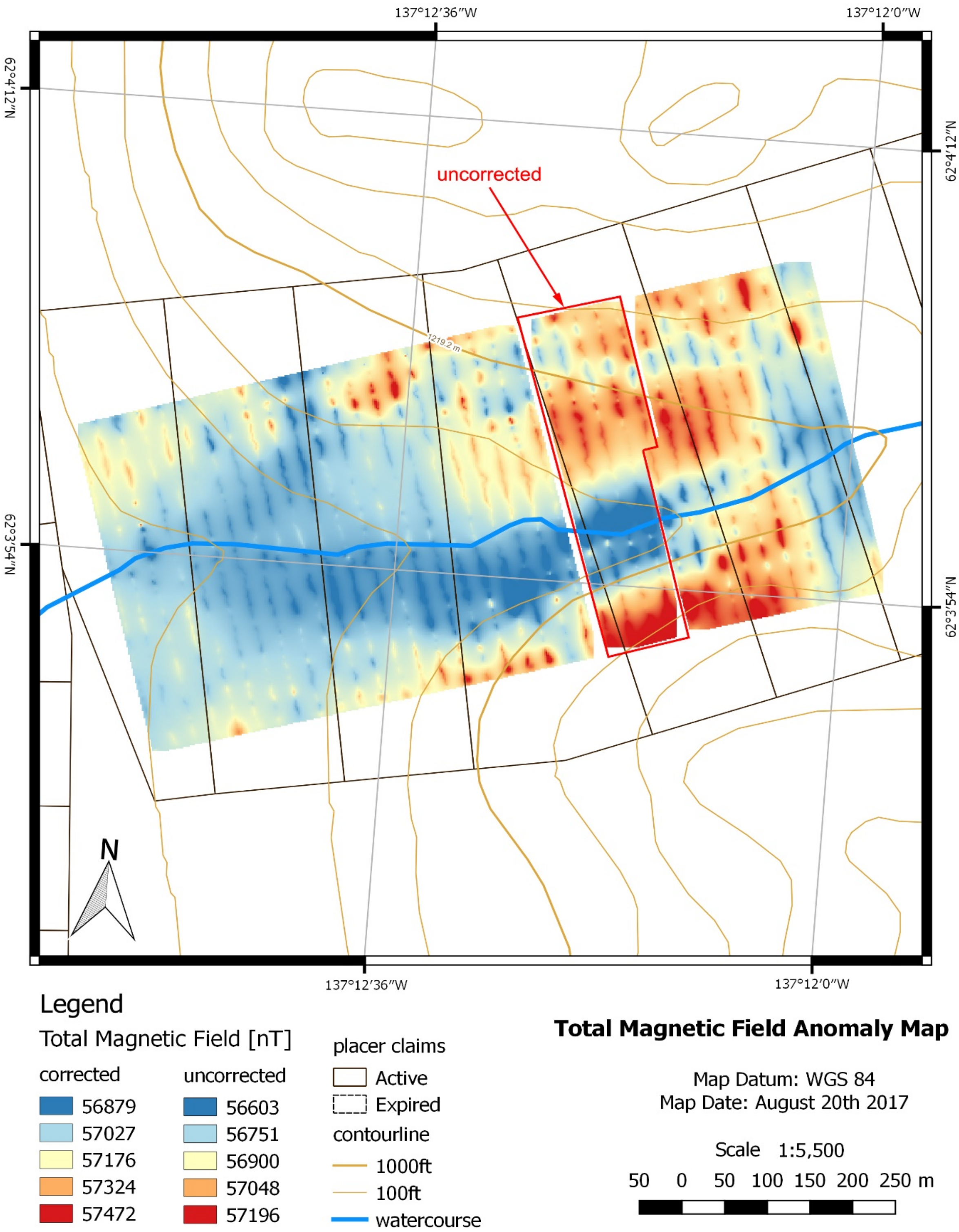
From 110m-135m the overburden becomes 5m-7m around the creek with lower resistivity indicating a higher gravel content. The bedrock dips at the creek with a slightly higher resistivity (yellow) possibly indicating gravels in a clayey silt matrix.

From 135m – 235 the overburden returns to high resistivity similar to Line 01 and Line 02. Observation of surface material is talus boulders in a sand matrix with a thin cover of moss. Type II bedrock appears to raise up closer to the surface seen as the high resistivity values(brown-red). Bedrock depth appears to remain at about 3-5m for the entire slope.

Unlike the previous profiles, there does not appear to be any channel structures on the southern slope. The areas of interest would be the dip in bedrock at 130m at a depth of 5-7m and the second dip in bedrock at 145m to a depth of 7-10m. The resistivity values are not consistent with each other in these two structure, indicating two different materials. The magnetic survey shows a local high near at the structure at 145m.

8. Magnetic Survey

8.1.1 Magnetic Survey Results



8.1.2 Interpretation: Ground Magnetics

The ground Magnetics overview does not display any particular features but gives an idea of the ground material trends around the area. The magnetometer measures an absolute value of residual magnetics, and is not associated with a depth. This means that the readings are most influenced by surface geology and exponentially less so with depth.

The low magnetic readings (darker blue) are interpreted as areas with thicker layers of overburden. From the resistivity profiles we see that a shallow bedrock tends to positively affect the magnetic values. This is not the case for the magnetic anomalies described in the resistivity profiles. This would mean that overburden is generally deeper around the creek, as well as a section on the south side of the northern slope. This could be a previous outwash plain depositing the sand seen just below the surface and in the pit located in Claim 1. This is not thought as the only source of sand but due to the magnetic low and abundance of sand, is a possible explanation.

The values become relatively higher as you go upstream. This explains a narrowing of the creek channel and rise of bedrock along the hill sides. This was confirmed by resistivity and IP profiles, with a few anomalies found on the south slope. These anomalies are not prevalent in the overall map due to effects of very high magnetic values along the ends. This is the basis for doing a separate magnetic profile overtop of each resistivity line.

9. Recommendations

Line 01 : testing at 220m, 240m, and possibly drilling at 350m due to its depth. A test pit could suffice in confirmation of material change

Line 02 : testing at 145m and 165m. The structure at 210m is very interesting but also a good ways up the hill slope. It is definitely worth investigating if there is a way to dig a test pit there.

Line 03 : testing at 145m.

We would recommend testing at an area where the blue structure comes close to the surface to confirm it is a bedrock layer.

10. Conclusion

Dolly Creek has a potential gravel channel 5-10m deep running along the current creek. There is also the possibility of a cross cutting channel running southwest along the southern slope and hill worth investigating. The claim 6 (Line 3)shows less evidence for channel features, due to the shallow bedrock depth and lack of substantial dips in bedrock near overburden interface.

11. Qualifications

Stefan Ostermaier, Geophysical Surveyor, Managing Partner, Arctic Geophysics Inc.
stefan.ostermaier@arctic-geophysics.com

Work Experience

Founded and employed at Arctic Geophysics Inc. since June 2007

Geophysical Surveying for Mining Exploration in the Yukon since 2005

Geological prospecting for precious metals and minerals in the Yukon and Alaska since 2001

Publications:

Numerous Assessment Reports BC & YT including:

2008	Dredge Master Gold Ltd.	Dawson Mining District	Yukon	Sixty Mile Area
2009	10796 Yukon Ltd.	Dawson Mining District	Yukon	Scroggie Creek
2010	Mel Zeiler	Mayo Mining District	Yukon	Duncan Creek
2010	YGS	Dawson Mining District	Yukon	White River
2011	Gold Miners Group Inc.	Whitehorse Mining District	Yukon	Kluane Lake
2011	Al Dendys	Atlin Mining Division	BC	Atlin
2012	Stephen Swaim	Whitehorse Mining District	Yukon	Livingston Area
2012	Bonnyville Oilfield Supply Ltd	Whitehorse Mining District	Yukon	Carmacks
2013	Victor Casavant	Atlin Mining Division	BC	Atlin
2014	Bens Contracting & Rental	Whitehorse Mining District	Yukon	Kluane Lake
2014	Angel Jade Mines Ltd.	Liard Mining Division	BC	Liard area
2014	Ron Berdahl	Whitehorse Mining District	Yukon	Carmacks
2014	Zenith Mineral Resources Ltd.	Cariboo Mining Division	BC	Likely
2015	44236 Yukon Inc.	Whitehorse Mining District	Yukon	Whitehorse
2015	Constellation Mines Ltd	Whitehorse Mining District	Yukon	Livingstone Area
2015	Rod G. Smith	Dawson Mining District	Yukon	Black Hills Creek
2015	Zenith Mineral Resources Ltd.	Cariboo Mining Division	BC	Wells
2015	Alex Loo	Cariboo Mining Division	BC	Wells
2016	Constellation Mines Ltd.	Whitehorse Mining District	Yukon	Livingston Area
2016	Bonnyville Oilfield Supply Ltd	Whitehorse Mining District	Yukon	Carmacks
2016	Chimlar, Leonard	Cariboo Mining Division	BC	Wells

2016	Tic Exploration Ltd.	Whitehorse Mining District	Yukon	Kluane Lake
2016	Paydirt Holdings	Dawson Mining District	Yukon	Black Hills Creek

Geophysical survey (45 field days) for Yukon Government: Yukon Geological Survey, 2D Resistivity/IP Data Release for Placer Mining & shallow Quartz Mining-Yukon 2010

http://virtua.gov.yk.ca:8080/lib/item?id=chamo:164867&theme=emr "2D resistivity / IP data release for placer mining and shallow quartz mining - Yukon 2010 : Los Angeles Creek, Wolf Creek, Ladue River, and Rice Creek ; Philipp Moll and Stefan Ostermaier"

Education

Study of Geology, University of Tübingen, Germany

Geophysical field courses, University of Karlsruhe and University of Stuttgart, Germany

Study of Computer Science, University of Stuttgart, Germany

David Storm, Geophysical Surveyor, Arctic Geophysics Inc.
david.storm@arctic-geophysics.com

Work Experience

Geophysical Surveying with Arctic Geophysics Inc. since June 2017
Hydrogeological Research Assistant for University of Alberta, May-August 2016

Education

B.Sc. in Geophysics at University of British Columbia, May 2017

Relevant Studies

Environmental, Geotechnical, and Exploration Geophysics I, Applied Geophysics, Geographic Information Science, Data Analysis and Machine Learning in Earth, Ocean, and Atmospheric Sciences

Assessment Reporting

2017	Taiga Mining Co	Alaska Mining Division	AK	
2017	L&M Mining Co	Dawson Mining District	YT	Dawson area
2017	Buckeye Land & Mineral	Atlin Mining Division	BC	Atlin area
2017	Buckeye Land & Mineral	Alaska Mining Division	AK	Alaska
2017	M Marteshev	Mayo Mining District	YT	Mayo area

Confirmation

We have interpreted the data and prepared this report entitled **2D Resistivity and Magnetometer Geophysical Surveys for Placer Prospecting at Dolly Creek, Yukon** for assessment credit, the surveys were carried out by Arctic Geophysics Inc. of Whitehorse, Yukon Territory

Stefan Ostermaier

David Storm

Costs

INVOICE

PO Box 31441 RPO Main Street,
Whitehorse, YT, Y1A 6K8
Ph: (867) 456-4343
info@arctic-geophysics.com
www.arctic-geophysics.com

Marlene Crawford

Invoice No: 2017YT-C(08)-0114
Date: 2017-11-14

Job:	Payment Terms
2D Resistivity/Mag Survey	**Invoices are due & payable upon receipt**
Dolly Creek	

Quantity	Description	Amount
	Mob/Demob	
2 days	Ford F350 Diesel Pickup @ $130.00/day	$260.00
706 kms	Total Mileage for Dolly Creek job @ .55/km.	$388.30
2 days	Travel time @ 30% of Survey Rate	$1,140.00
1.5 days	Meals 2 persons @ $75.00/day /person	$225.00
	Total Mob/Demob Costs	**$2,013.30**
	2D Resistivity/Mag Survey	
2 days	Geoelectrical 2D Resistivity Imaging System:	
	96 electrodes, 6 Electrode Control Modules, 475m multi-core cable, PC,	
	cable, PC, software, GPS, altimeter & Crew @ $1900.00/day	$3,800.00
3 days	GEM GSM-19 High Precision Over Hauser Magnetometer	
	Equip & Crew @ $1100.00/day	$3,300.00
5 days	Meals & Accomodation (on site)	$500.00
5 days	Ford F350 Diesel Pickup @ $130.00/day	$650.00
1.75 days	On site Data Analysis, Intepretation, Processing, Formal Report @ 75% of survey rate	$2,493.75
	Total Survey Costs	**$10,743.75**

Subtotal	$ **12,757.05**
G.S.T. (5%) #846363216RT0001	637.85
TOTAL	**$ 13,394.90**

Payment is expected within 10 days of the Invoice date

Late payment charges will apply - Interest is charged at 3% monthly (42.58% per annum)

Please contact the office (867)456-4343 for Banking Information

Thank you, we appreciate your business

Appendix

<u>Work Cited</u>

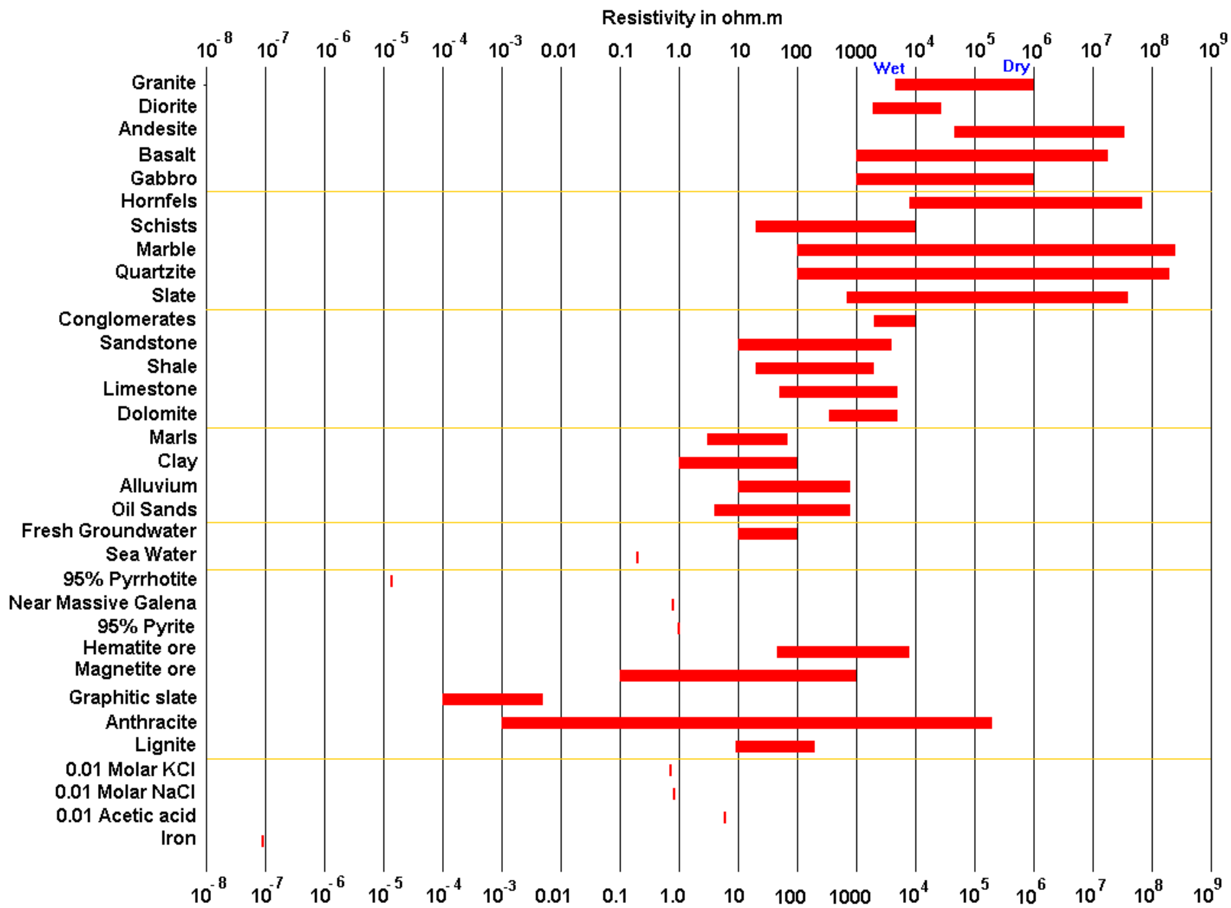
Loke , M.H., 2015. Tutorial : 2-D and 3-D electrical imaging surveys

<u>Map Layers</u>

Energy, Mines and Resources, Yukon 2017

Geomatics Yukon, 2017

<u>Resistivity of Common Earth Materials</u>



From Loke (2015).

GPS Data

Line01

Electrode No.	Location in Profile [m]	GPS-Coordinates WGS 84 [ddd° mm' ss.s'']	GPS-Accuracy [m]	Post [*]
1	0	N62 04 00.1 W137 12 51.7	3	*
2	5	N62 04 00.0 W137 12 51.6	3	
3	10	N62 03 59.8 W137 12 51.5	3	
4	15	N62 03 59.7 W137 12 51.4	3	
5	20	N62 03 59.6 W137 12 51.3	3	
6	25	N62 03 59.4 W137 12 51.2	3	
7	30	N62 03 59.3 W137 12 51.1	3	
8	35	N62 03 59.1 W137 12 51.0	3	
9	40	N62 03 59.0 W137 12 50.9	3	
10	45	N62 03 58.8 W137 12 50.9	3	
11	50	N62 03 58.7 W137 12 50.8	3	
12	55	N62 03 58.5 W137 12 50.6	3	
13	60	N62 03 58.4 W137 12 50.5	3	
14	65	N62 03 58.3 W137 12 50.4	3	
15	70	N62 03 58.1 W137 12 50.3	3	
16	75	N62 03 58.0 W137 12 50.2	3	
17	80	N62 03 57.8 W137 12 50.1	3	
18	85	N62 03 57.7 W137 12 50.0	3	
19	90	N62 03 57.5 W137 12 49.8	3	
20	95	N62 03 57.4 W137 12 49.8	3	
21	100	N62 03 57.2 W137 12 49.6	3	
22	105	N62 03 57.1 W137 12 49.6	3	
23	110	N62 03 56.9 W137 12 49.6	3	
24	115	N62 03 56.7 W137 12 49.5	3	
25	120	N62 03 56.5 W137 12 49.4	3	
26	125	N62 03 56.4 W137 12 49.3	3	
27	130	N62 03 56.3 W137 12 49.2	3	
28	135	N62 03 56.1 W137 12 49.1	3	
29	140	N62 03 56.0 W137 12 49.1	3	
30	145	N62 03 55.8 W137 12 49.0	3	
31	150	N62 03 55.7 W137 12 48.9	3	
32	155	N62 03 55.5 W137 12 48.9	3	
33	160	N62 03 55.4 W137 12 48.8	3	
34	165	N62 03 55.2 W137 12 48.7	3	
35	170	N62 03 55.1 W137 12 48.6	3	
36	175	N62 03 54.9 W137 12 48.5	3	
37	180	N62 03 54.7 W137 12 48.4	3	
38	185	N62 03 54.6 W137 12 48.3	3	
39	190	N62 03 54.4 W137 12 48.2	3	
40	195	N62 03 54.3 W137 12 48.1	3	
41	200	N62 03 54.1 W137 12 48.1	3	
42	205	N62 03 53.9 W137 12 47.7	3	

Electrode No.	Location in Profile [m]	GPS-Coordinates WGS 84 [ddd° mm’ ss.s’’]	GPS-Accuracy [m]	Post [*]
43	210	N62 03 53.8 W137 12 47.7	3	
44	215	N62 03 53.5 W137 12 47.6	3	
45	220	N62 03 53.4 W137 12 47.6	3	
46	225	N62 03 53.2 W137 12 47.5	3	
47	230	N62 03 53.1 W137 12 47.2	3	
48	235	N62 03 52.9 W137 12 47.2	3	
49	240	N62 03 52.8 W137 12 47.0	3	
50	245	N62 03 52.6 W137 12 46.9	3	
51	250	N62 03 52.5 W137 12 47.0	3	
52	255	N62 03 52.3 W137 12 46.9	3	
53	260	N62 03 52.2 W137 12 46.8	3	
54	265	N62 03 52.1 W137 12 46.7	3	
55	270	N62 03 51.9 W137 12 46.7	3	
56	275	N62 03 51.8 W137 12 46.6	3	
57	280	N62 03 51.6 W137 12 46.5	3	
58	285	N62 03 51.5 W137 12 46.3	3	
59	290	N62 03 51.3 W137 12 46.3	3	
60	295	N62 03 51.1 W137 12 46.2	3	
61	300	N62 03 51.0 W137 12 46.2	3	
62	305	N62 03 50.8 W137 12 46.0	3	
63	310	N62 03 50.7 W137 12 45.8	3	
64	315	N62 03 50.5 W137 12 45.8	3	
65	320	N62 03 50.4 W137 12 45.7	3	
66	325	N62 03 50.2 W137 12 45.7	3	
67	330	N62 03 50.1 W137 12 45.6	3	
68	335	N62 03 49.9 W137 12 45.6	3	
69	340	N62 03 49.7 W137 12 45.6	3	
70	345	N62 03 49.6 W137 12 45.5	3	
71	350	N62 03 49.4 W137 12 45.4	3	
72	355	N62 03 49.3 W137 12 45.4	3	
73	360	N62 03 49.1 W137 12 45.3	3	
74	365	N62 03 48.9 W137 12 45.2	3	
75	370	N62 03 48.8 W137 12 45.2	3	
76	375	N62 03 48.6 W137 12 45.0	3	
77	380	N62 03 48.5 W137 12 45.0	3	
78	385	N62 03 48.3 W137 12 44.9	3	
79	390	N62 03 48.2 W137 12 44.9	3	
80	395	N62 03 48.0 W137 12 44.8	3	*

Line02

Electrode No.	Location in Profile [m]	GPS-Coordinates WGS 84 [ddd° mm' ss.s'']	GPS-Accuracy [m]	Post [*]
1	0	N62 03 59.4 W137 12 30.9	3	*
2	5	N62 03 59.3 W137 12 30.8	3	
3	10	N62 03 59.1 W137 12 30.7	3	
4	15	N62 03 59.0 W137 12 30.6	3	
5	20	N62 03 58.8 W137 12 30.6	3	
6	25	N62 03 58.7 W137 12 30.5	3	
7	30	N62 03 58.5 W137 12 30.4	3	
8	35	N62 03 58.3 W137 12 30.4	3	
9	40	N62 03 58.2 W137 12 30.3	3	
10	45	N62 03 58.0 W137 12 30.2	3	
11	50	N62 03 57.9 W137 12 30.2	3	
12	55	N62 03 57.7 W137 12 30.1	3	
13	60	N62 03 57.6 W137 12 30.1	3	
14	65	N62 03 57.4 W137 12 30.1	3	
15	70	N62 03 57.2 W137 12 29.9	3	
16	75	N62 03 57.1 W137 12 29.8	3	
17	80	N62 03 56.9 W137 12 29.8	3	
18	85	N62 03 56.8 W137 12 29.8	3	
19	90	N62 03 56.6 W137 12 29.8	3	
20	95	N62 03 56.4 W137 12 29.7	3	
21	100	N62 03 56.3 W137 12 29.6	3	
22	105	N62 03 56.1 W137 12 29.5	3	
23	110	N62 03 56.0 W137 12 29.5	3	
24	115	N62 03 55.8 W137 12 29.3	3	
25	120	N62 03 55.7 W137 12 29.2	3	
26	125	N62 03 55.5 W137 12 29.1	3	
27	130	N62 03 55.3 W137 12 29.0	3	
28	135	N62 03 55.2 W137 12 28.9	3	
29	140	N62 03 55.0 W137 12 28.8	3	
30	145	N62 03 54.9 W137 12 28.8	3	
31	150	N62 03 54.8 W137 12 28.7	3	
32	155	N62 03 54.6 W137 12 28.7	3	
33	160	N62 03 54.4 W137 12 28.7	3	
34	165	N62 03 54.3 W137 12 28.5	3	
35	170	N62 03 54.1 W137 12 28.5	3	
36	175	N62 03 53.9 W137 12 28.4	3	
37	180	N62 03 53.8 W137 12 28.4	3	
38	185	N62 03 53.7 W137 12 28.4	3	
39	190	N62 03 53.5 W137 12 28.3	3	
40	195	N62 03 53.3 W137 12 28.2	3	
41	200	N62 03 53.2 W137 12 28.2	3	
42	205	N62 03 53.1 W137 12 28.1	3	
43	210	N62 03 53.0 W137 12 28.1	3	
44	215	N62 03 52.8 W137 12 28.0	3	

Electrode No.	Location in Profile [m]	GPS-Coordinates WGS 84 [ddd° mm' ss.s'']	GPS-Accuracy [m]	Post [*]
45	220	N62 03 52.7 W137 12 27.9	3	
46	225	N62 03 52.5 W137 12 27.9	3	
47	230	N62 03 52.4 W137 12 27.9	3	
48	235	N62 03 52.2 W137 12 27.8	3	
49	240	N62 03 52.1 W137 12 27.7	3	
50	245	N62 03 52.0 W137 12 27.7	3	
51	250	N62 03 51.8 W137 12 27.7	3	
52	255	N62 03 51.7 W137 12 27.6	3	
53	260	N62 03 51.5 W137 12 27.5	3	
54	265	N62 03 51.4 W137 12 27.4	3	
55	270	N62 03 51.3 W137 12 27.3	3	
56	275	N62 03 51.1 W137 12 27.2	3	
57	280	N62 03 51.0 W137 12 27.1	3	
58	285	N62 03 50.8 W137 12 27.1	3	
59	290	N62 03 50.7 W137 12 27.0	3	
60	295	N62 03 50.5 W137 12 26.9	3	
61	300	N62 03 50.4 W137 12 26.8	3	
62	305	N62 03 50.2 W137 12 26.8	3	
63	310	N62 03 50.1 W137 12 26.7	3	
64	315	N62 03 49.9 W137 12 26.7	3	*

Line03

Electrode No.	Location in Profile [m]	GPS-Coordinates WGS 84 [ddd° mm’ ss.s’’]	GPS-Accuracy [m]	Post [*]
1	0	N62 04 02.7 W137 12 12.2	3	*
2	5	N62 04 02.5 W137 12 12.0	3	
3	10	N62 04 02.4 W137 12 11.9	3	
4	15	N62 04 02.2 W137 12 11.8	3	
5	20	N62 04 02.0 W137 12 11.7	3	
6	25	N62 04 01.9 W137 12 11.6	3	
7	30	N62 04 01.7 W137 12 11.5	3	
8	35	N62 04 01.5 W137 12 11.4	3	
9	40	N62 04 01.4 W137 12 11.3	3	
10	45	N62 04 01.2 W137 12 11.2	3	
11	50	N62 04 01.1 W137 12 11.0	3	
12	55	N62 04 01.0 W137 12 10.9	3	
13	60	N62 04 00.8 W137 12 10.7	3	
14	65	N62 04 00.7 W137 12 10.7	3	
15	70	N62 04 00.5 W137 12 10.5	3	
16	75	N62 04 00.4 W137 12 10.4	3	
17	80	N62 04 00.2 W137 12 10.3	3	
18	85	N62 04 00.1 W137 12 10.2	3	
19	90	N62 03 59.9 W137 12 10.1	3	
20	95	N62 03 59.8 W137 12 09.9	3	
21	100	N62 03 59.7 W137 12 09.8	3	
22	105	N62 03 59.5 W137 12 09.7	3	
23	110	N62 03 59.4 W137 12 09.6	3	
24	115	N62 03 59.2 W137 12 09.5	3	
25	120	N62 03 59.0 W137 12 09.4	3	
26	125	N62 03 58.9 W137 12 09.3	3	
27	130	N62 03 58.7 W137 12 09.3	3	
28	135	N62 03 58.6 W137 12 09.2	3	
29	140	N62 03 58.4 W137 12 09.1	3	
30	145	N62 03 58.3 W137 12 08.9	3	
31	150	N62 03 58.1 W137 12 08.8	3	
32	155	N62 03 58.0 W137 12 08.7	3	
33	160	N62 03 57.9 W137 12 08.6	3	
34	165	N62 03 57.7 W137 12 08.5	3	
35	170	N62 03 57.6 W137 12 08.4	3	
36	175	N62 03 57.5 W137 12 08.3	3	
37	180	N62 03 57.3 W137 12 08.1	3	
38	185	N62 03 57.2 W137 12 08.0	3	
39	190	N62 03 57.1 W137 12 07.9	3	
40	195	N62 03 56.9 W137 12 07.8	3	
41	200	N62 03 56.8 W137 12 07.7	3	
42	205	N62 03 56.7 W137 12 07.5	3	
43	210	N62 03 56.5 W137 12 07.4	3	
44	215	N62 03 56.4 W137 12 07.4	3	

45	220	N62 03 56.2 W137 12 07.3	3	
46	225	N62 03 56.1 W137 12 07.2	3	
47	230	N62 03 55.9 W137 12 07.1	3	
48	235	N62 03 55.8 W137 12 06.9	3	*