2D Resistivity Survey for Placer Exploration, Livingstone Creek, Yukon

Report Prepared for:

Golden Ram Inc.

33119 Ogilvie Street

Whitehorse, Yukon, Y1A 5Y5

Whitehorse Mining Placer District

NTS MAPSHEET 105E08 (Livingstone Creek)

Location (UTM): 536790 6799206

December 31, 2020

Prepared by David Storm, **Boreal GeoSciences**

P.O. Box 31402 Stn Main, Whitehorse, YT, Y1A 6K8, 867-456-4343

Contents

1 Introduction

The 2D Resistivity survey was conducted to explore Livingstone Creek for bedrock depth, paleochannel delineation, and structural IP anomalies. The Dipole - Dipole array was used throughout the survey for its capabilities in highlighting vertical changes. The area is known to have incised channels making a Dipole – Dipole array suitable. IP measurements that are collected in tandem with apparent resistivity measurements are included in the report to support the bedrock delineation process as well as further the exploration potential.

2 Location and Access

The geophysical investigation using 2D Resistivity was performed at Livingstone Creek, YT.

The survey area is in the Whitehorse Mining District, 86 km North East of Whitehorse, YT.

The survey area was accessed by quad using historic trails running through the claims

3 List of Claims

GRANT NUM	Claim Name	OWNER
43159	ALPINE	Gail Foote - 100%
P 03016	ALPINE 1	Gail Foote - 100%
P 513215	STYRIA 18	Gail Foote - 100%
P 513216	MAX 1	Golden Ram Inc. - 100%
P 513217	MAX 2	Golden Ram Inc. - 100%
P 513218	MAX 3	Golden Ram Inc. - 100%
P 513219	MAX 4	Golden Ram Inc. - 100%
P 513220	MAX 5	Golden Ram Inc. - 100%

P 513221	MAX 6	Golden Ram Inc. - 100%
P 513222	MAX 7	Golden Ram Inc. - 100%
P 513223	MAX 8	Golden Ram Inc. - 100%
P 513224	MAX 9	Golden Ram Inc. - 100%
P 513225	MAX 10	Golden Ram Inc. - 100%

4 Crew

Resistivity crew: David Storm, Jessica Pickett, Boreal GeoSciences

Support, Documentation: Heidi Kulcheski, Boreal GeoSciences

Line planning: Boreal GeoSciences and Max Fuerstner

5 Fieldwork – Schedule

Fieldwork: The resistivity consisted of thirteen survey lines (length described on each profile), conducted from September 8th – 12th, 2020.

Processing, Interpretation and First Documentation of Resistivity data was done September 8th, 2020.

6 Geophysical Methods

6.1 Resistivity

Resistivity is a material property that measures how strongly a material opposes the flow of electric current. The purpose of resistivity surveys is to measure the subsurface resistivity distribution. The resistivity 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 to potential electrodes. The equipment used in this study is designed to measure layer interfaces in depths from 1 m to 100 m by varying the spacing between electrodes.

6.2 Induced Polarization (IP)

Induced Polarization, IP, is measured by injecting direct current into the soil. The induced polarization of the ground materials is the result of electrochemical processes. When the current is removed, induced voltage will decay in a mineralogically characterized rate. Sulfides (for example pyrite) result in a slowly decaying signal while clay-like minerals result in a very quickly decaying 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.

7 Use of Geophysical Method

7.1 Instrumentation

7.1.1 Resistivity/IP Instrumentation

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

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

“4 POINT LIGHT” EARTH RESISTIVITY METER[1]

80 ELECTRODE CONTROL MODULES[2]

80 STAINLESS STEEL ELECTRODES[2]

1 Constructed and produced by LGM (Germany)

2 Constructed and produced by GEOANALYSIS. DE (Germany)

320 m MULTICORE CABLE: CONNECTOR SPACING: 5 m[2]

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.

7.2 Data Acquisition

7.2.1 Resistivity Data Acquisition/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 DC transmitter current switches polarity every $1/30^{th}$ to $4/30^{ths}$ of a second and is amplified by the electrode control modules, up to a maximum of 100 mA and 200V. The voltage, measured at the receiver electrodes (M, N), is also amplified. In this resistivity survey the Dipole-Dipole array was used. The Dipole-Dipole array is appropriate to image vertical structures, which is ideal for identifying vertical changes in the bedrock interface.

7.3 Data Processing

7.3.1 Resistivity/IP Data Processing

The measured Resistivity data is processed with the RES2DINV inversion program[3]. Profiles are displayed as rectangular cross sections known as an extended profile. The measured data is collected in an upside-down triangle (pseudo section) due to the geometry of measuring electrical potential, but the inversion is more stable when extending the triangular boundaries to a rectangle. Therefore, the inverted profiles have a section of purely interpolated data, making them unreliable for predicting true structure.

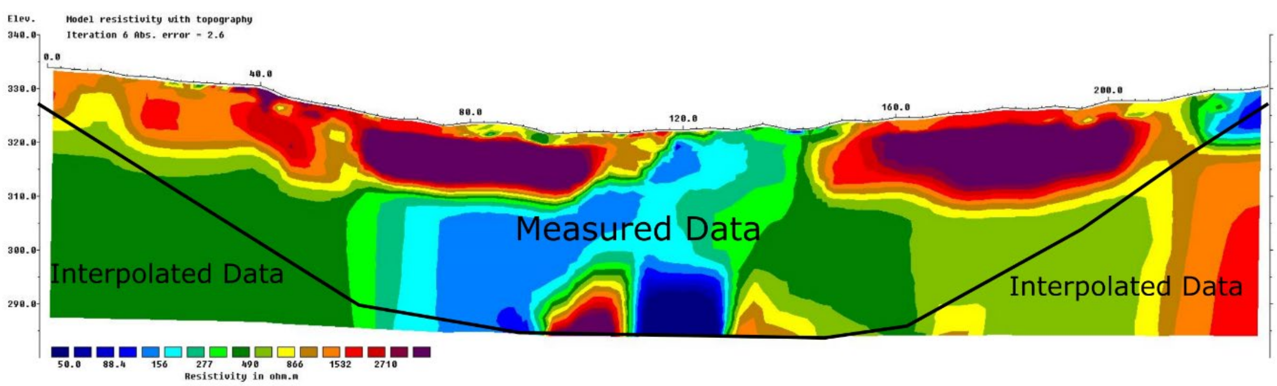

Figure 01: Measured data versus interpolated data on resistivity and IP profiles

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3 Produced by GEOTOMO SOFTWARE (Malaysia)

8 Interpretation Format

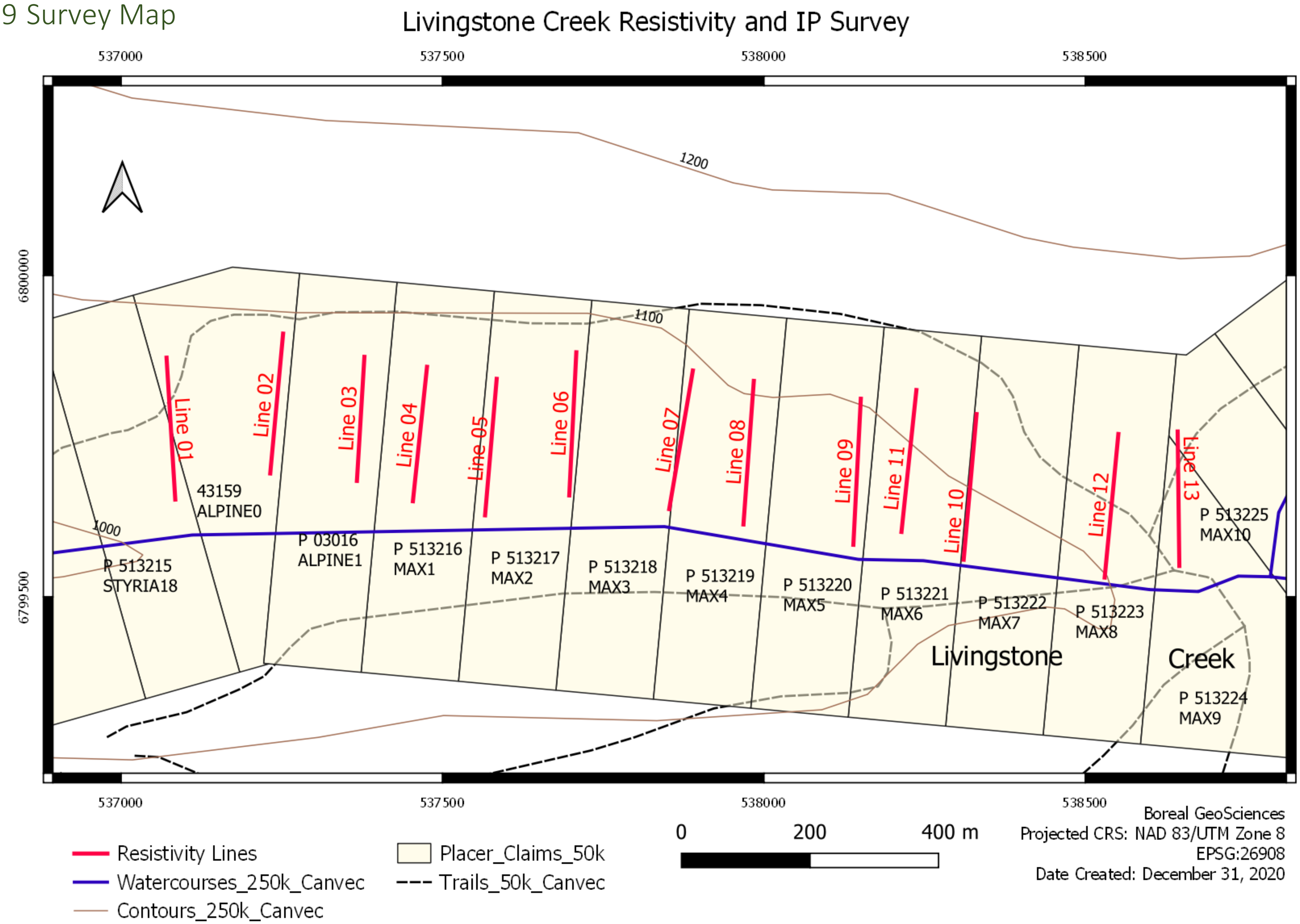
The Interpretation section will be referencing individual profiles regularly. Keep profiles on hand as a visual aid to better understand the text. Profiles will have a structural interface line presenting the most probable depth of sediment to bedrock interfaces. The use of both IP and Resistivity contribute to the interpreted interface. Recurring patterns of bedrock and surficial anomalies are seen in multiple profiles and will be explained using examples from the profiles. Beyond the examples, notable anomalies will be mentioned in the Recommendations section. Resistivity and IP contour values (scale is visible on the bottom of each profile) remain consistent throughout the profiles with occasional small changes to the max values of resistivity profiles. When comparing different profiles beyond this report's interpretation scope, remember to note the resistivity scale on the profile as they may be slightly different. The significance of IP anomalies will be explained in the Interpretation section, where relevance to placer potential is yet to be proven. Profiles are placed in sequential order traveling up valley (Take note that Line 11 and Line 10 are switched, see Survey Map). The overviews of bedrock and overburden will serve to present the inverted data and correlations that can be derived from these values.

The Discussion section will speak further to any theoretical continuity between profiles where conclusions cannot be explicitly drawn from the data but remain as plausible explanations for conclusions that can be made on the survey results. Recommendations serve as logical test locations near surface where Resistivity and IP correlations to interpreted results can be confirmed to ensure confidence in deeper exploration.

GPS locations of each electrode used in the survey exist in the GPS folder located on the USB drive provided with the report. Profiles have position numbers and tick marks along the surface denoting horizontal position along the line. Each tick mark is placed 2.5 m apart, and the location of an anomaly explained in the report (e.g 160 m) can be found in its corresponding survey lines GPS file, under the title "Position (m)".

A Garmin Import Readme file is included in the GPX folder on the USB Drive to explain the process for importing gpx files to your Garmin,

9 Survey Map


Livingstone Creek Resistivity and IP Survey
537000
537500
538000
538500
6800000
6799500
1200
1100
1000
Line 01
Line 02
Line 03
Line 04
Line 05
Line 06
Line 07
Line 08
Line 09
Line 10
Line 11
Line 12
Line 13
43159
ALPINE0
P 03016
ALPINE1
P 513215
STYRIA18
P 513216
MAX1
P 513217
MAX2
P 513218
MAX3
P 513219
MAX4
P 513220
MAX5
P 513221
MAX6
P 513222
MAX7
P 513223
MAX8
P 513224
MAX9
P 513225
MAX10
Livingstone
Creek
Resistivity Lines
Watercourses_250k_Canvec
Contours_250k_Canvec
Placer_Claims_50k
Trails_50k_Canvec
0
200
400 m
Boreal GeoSciences
Projected CRS: NAD 83/UTM Zone 8
EPSG:26908
Date Created: December 31, 2020

10 Interpretation:

10.1 Bedrock Overview

There are three different bedrock signatures seen in the Resistivity and IP profiles. The occurrence of increased mrad locations in the IP data are distinguishable on each profile. Bedrock faulting features generally appear as local resistivity lows with increased IP values due to decomposition of rock chemically and mechanically. In the Livingstone survey, clay rich material appears to be measuring in the same range as suspected fractured decomposing rock, but IP activity helps to resolve the difference between the low resistivity anomalies. There are a few other consistent anomalous IP features throughout the profiles and are explained in the Interpretation section.

1. **Low resistivity, high IP bedrock features** (20 – 80 ohm*m with greater than 9 mrad). Line 01, 06, and 10 each show an anomalous low resistivity section correlating to an anomalous high IP reading. Surveying 13 sequential lines through the valley provided a base for characterizing resistivity regimes of the bedrock. An average reading of homogenous bedrock is usually in the range of 800 – 2500 ohm*m. This is verified on the hill slope of each profile, where bedrock outcrops provide further evidence of this resistivity range. Fluvial overburden shows consistently low resistivity values throughout the survey area, where values are suspected to correlated to percentage of clay or decomposition within the rock matrix whereas colluvial overburden appears to show mid to high resistivity. A decrease in grain size will tend to decrease porosity, which in turn decreases resistivity. This leaves less space for pores/voids (infinitely resistive when not filled with water) to occur as well as increases water retention, creating percentages of water saturation. Clay is not only characterized by grain size, but also laminar structure. The laminar structure can help maximize water retention as well as minimize resistance to current flow. In an area where schist is the dominant bedrock type, decomposition or erosion of this bedrock will likely produce a large amount of clay (Experience in other schist dominant areas has shown a similar trend). Figure 02 shows a section in Line 06 where a relatively thin, extremely low resistivity feature appears at depth and is likely due to a faulting event. The faulting event mechanically breaks down the rock, causing degradation and creating voids. Fluids will then flow through the structure, further decomposing the rock while also enriching it with sulfides and causing even further chemical decomposition in newly fractured bedrock. The sulfide rich rock produces an increased polarization response compared to the less disturbed rock around it. Clay deposited by fluvial events on the other hand are usually found to have a depleted IP signal, making it differentiable from the faulted bedrock structure. Figure 03 shows Line 01, where the extreme low appears bounded by high resistivity contours right at the bottom of the profile yet appears to have a similar IP anomaly within the

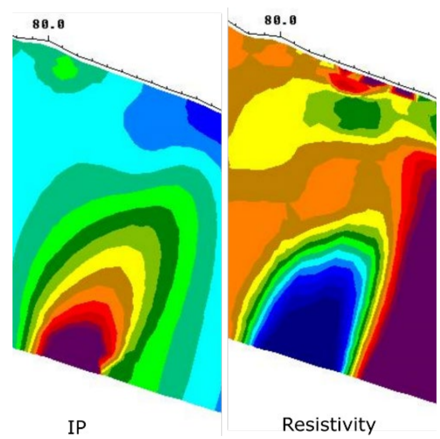


Figure 02: Line 06 - low resistivity spike

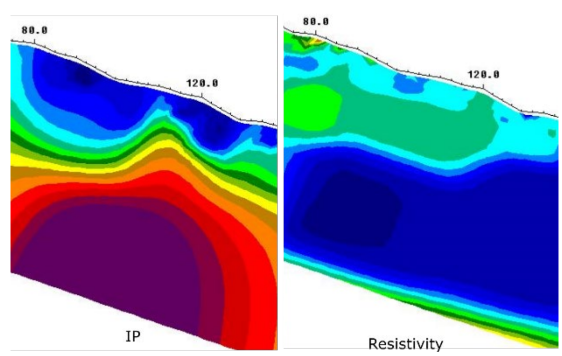


Figure 03: Line 01 low resistivity section with increased IP

low resistivity structure. The client explained that if the low resistivity were to be revealed as a clay rich fluvial sediment, then this channel would be much larger than expected to the point of being unlikely. The lack of IP response in what is known to be clay rich overburden within the survey helps to interpret this sections likelihood of being bedrock. Fault like structures will be correlated in the discussion section to help understand if structural bedrock anomalies may help to influence channel characteristics.

2. **Transitioning low to high resistivities with increased IP** (300 – 600 Ohm *m with 4 - 9 mrad). Figure 04 displays a few variations of the transition zone seen on the profiles. The vertically oriented transition zones are seen in almost every profile except for Line 01, 05, 06, and Line 10. Each profile shows a different size and value range of these, but the trend is the same. It is generally a discontinuity between high resistivity bedrock and a slight to major increase in IP. The interpreted structure is like that of Bedrock Type 1, where some faulting has created space for fluid that variably decomposed the bedrock. Alternately, this is possibly a metamorphic zone, where grain size or dominant rock type of the bedrock has changed causing a deformation signature. The survey is not particularly focused on bedrock, but a further geological follow up could help to determine the structural or lithologic origins of this repeating signature.

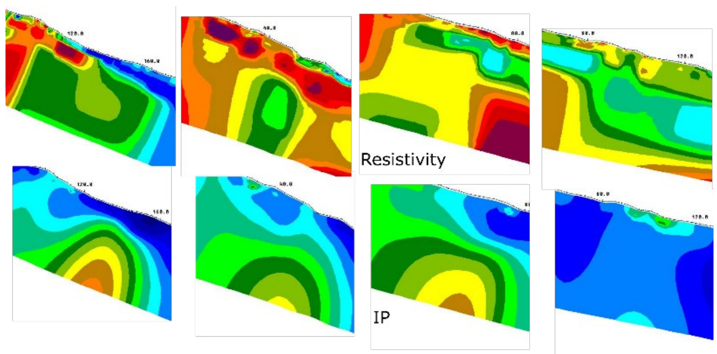


Figure 04: Line 02, 04, 07, and 11 – Transitioning resistivity section with increased IP

3. **High and medium resistivity homogeneous bedrock** (800 – 2000 ohm*m with <5 mrad). A consistent high resistivity structure appears on each profile with a more widespread base on each appearance compared to the transition and faulting signatures. The IP signature tends to be minimal in this bedrock structure, but the contrast between this and the low resistivity clay rich overburden helps to accurately map a bedrock interface.

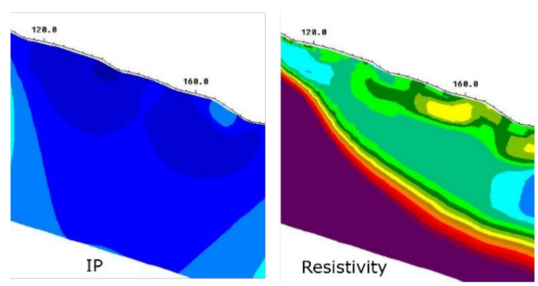


Figure 05: Line 06 – High resistivity with low IP values

10.2 Overburden Overview

Low Resistivity overburden:

The most prominent feature throughout the profiles is the low resistivity overburden. A resistivity range between 50 and 120 ohm*m in sediment material indicates a high likelihood of clay in the matrix or a silt to gravel mixture with varying degrees of water saturation. Regarding water saturation, Line 01 – Line 11 do not show any consistent water table qualities, nor is the resistivity significantly lower or higher as each profile nears Livingstone Creek. This indicates that water saturation is likely not the cause of the variations seen in the profiles, and a similar level of saturation can be assumed throughout the survey ground. Observations of virgin ground and sidewalls of previously worked ground yielded suspended exposed boulders within a clay rich material. This clay will act as a semi-permeable boundary for any local ground water coming from overland flow, yielding the interpretation that lower extents of overburden features are structural interfaces, not simply groundwater extents. Channel like shape is seen throughout these low resistivity appearances near the creek and sporadically within the hill slope. Bedrock interfaces are drawn on each profile for specific analysis of depth in areas of interest.

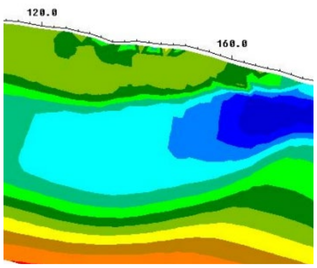


Figure 06: Line 10 showing an uncharacteristically widening low resistivity contour change.

Lines 01 – 06, excluding Line 02, show a prominent high resistivity bounding contour on the right most extent of each, where overburden appears to be 30 m deep on average. Conductive material tends to create a large area of influence in measurements at depth, making features a little less defined in low resistivity regions unless a large contrast in resistivity exists at the conductive layer's extent. This would mean that a thin, diagonal cutting, low resistivity feature, may be distorted and appear as a wider cross cutting feature. An indicator of capturing structure at an angle is an uncharacteristic widening of contours, which can be seen in Figure 6.

The right bounding high resistivity feature starts to disappear around Line 07, which also begins a widening shallower trend of the clay rich overburden higher up on the hill slope where downslope profiles show shallow bedrock (Figure 07). Line 07 shows a small localized low resistivity that appears to begin a widening trend up valley. In Line 08 – 09 The feature becomes more distinguished with lower resistivity while also appearing to represent significant downcutting in the bedrock.

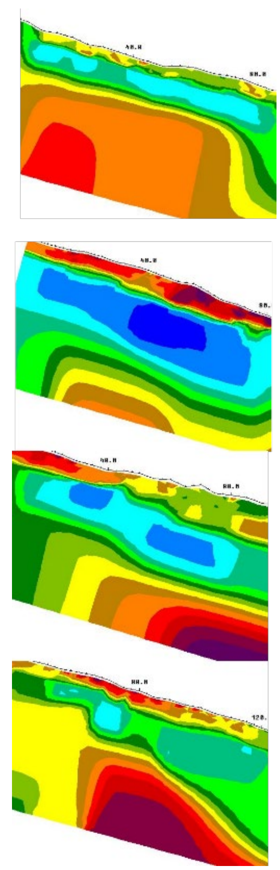


Figure 07: Line 07 – 11 (in sequential order traveling up valley from text), Showing a similarly shaped channel feature on a bench like elevated feature.

Line 11, 10, and 12 show a large shift in channel structure concerning the trend seen in Figure 07. Line 11 shows a relatively thin layer of consistent thickness on the hill slope, while Line 10 shows an overburden structure that is 3 times as thick with a channel like down cut at its lower extent. This lower extent is almost 10m lower in elevation than the thin clay structure in Line 11, making it very unlikely that they are a similar fluvial event. This leads to an interpretation that a side moraine glacial lake formed near Line 11, increasing in depth and sediment deposition down valley to Line 08, then pinching out on Line 07, and then more so on Line 06, where the feature begins to disperse toward the center of the valley. An alternative is that the large resistivity low seen on Line 10 near the creek had enough energy during this deposition to work into the bench that far. This could explain the anomaly seen in Figure 6, where the resistivity line crosscut a skinnier, energetic channel at an angle that was directed into the hill slope. When considering the 20 m elevation increase between the two features lower extent while traveling down valley, a deposition model would need more support. Although, there is a correlation that could be made with the top of the deep cutting feature on Line 11 and the bottom of the feature seen on the hill slope of Line 09. In support of the glacial moraine lake theory, there is a prominent increase in resistivity interpreted as overburden structure separating the two low resistivity features on Lines 08 - 11, indicating either a peculiar, clay poor deposition event, or an increased amount of gravel/sand/silt that has not yet been reworked by a fluvial event. Although this may belong in the Discussion section, it is important to understand that without that sedimentary resistivity high and elevation correlation, the interpretation of a bedrock interface and fluvial events creating the features would lack support.

The amount of change between Line 11 and Line 10 over such a small distance up valley remains difficult to explain in terms of fluvial deposition. Line 10 appears to have increased IP activity near the large low resistivity on the right extent of the profile, making the possibility of the extreme low resistivity as being a fault more likely. In support of that, the inferred major fault traveling through the valley also maps to this location (See Map 02). A major fault running North East to South West could help to explain the sudden change in deposition environment, as it would create weakness in the bedrock where fluvial events or glacial gouge features could take advantage. A more logical direction for this to cause significant influence would be in the South West direction traveling down valley.

Line 10 also has a significantly deep low resistivity structure centered at the 40 m electrode position. Elevation of the lower extent of this feature does not line up with the Line 10 hillslope feature referred to in Figure 7, nor does it have an up-valley continuation to Line 12. This makes it a unique overburden feature but lacking in continuity.

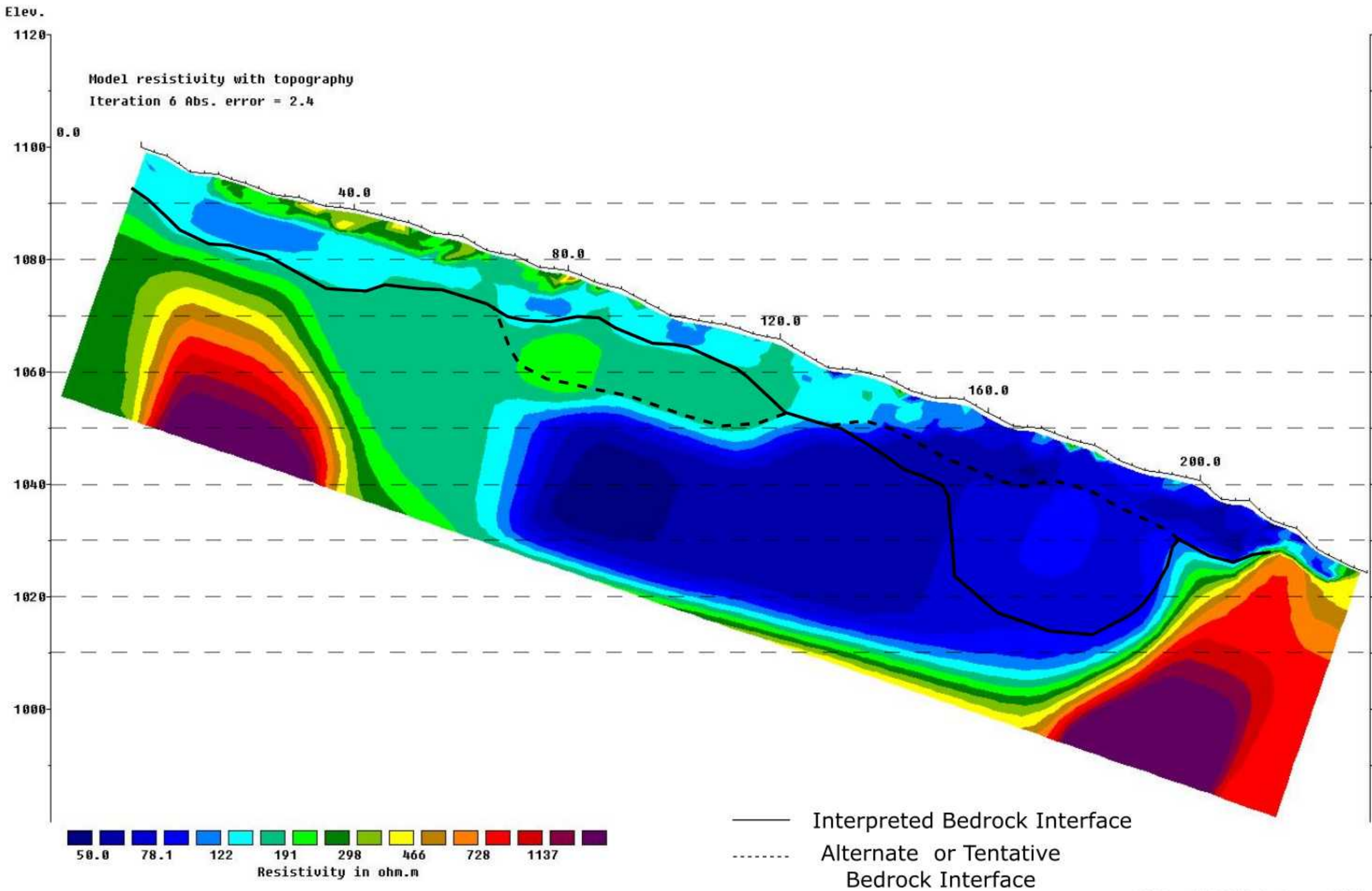
Lines 12 and 13 have a more water table like elevation consistency. The worm shaped low resistivity coming to the surface at the right extent of the profile shows two water table like features. First, the upper extent of the low resistivity rises at a consistent angle as the surface rises at a different angle (hydraulic head like consistency) Secondly, the lower extent appears at a consistent elevation (1110 m on Line 11, 1115 m on Line 12). Significant IP lows occur in locations on each profile that may indicate paleochannel beyond the horizontally consistent resistivity anomalies seen on the two profiles. The interpreted bedrock interface follows these IP lows and are suspected to be more likely because of depths of overburden seen down valley. The migrating low resistivity towards the hill slope may also help explain the appearance of a second channel in Line 11. Furthermore, the high resistivity overburden on the hill slope appears to have much less vertical consistency than seen in other profiles with no IP spikes to the surface to help distinguish between bedrock and overburden. The interpreted interface remains that much of the high resistivity is a sandier overburden due to the shape of contours, the location proximal to the fork in the creek, and abrupt shallowing of hill slope angle.

<u>High Resistivity overburden:</u>

Localized high resistivity overburden (300 – 1800 ohm*m) is seen in throughout the survey, mostly occurring from the surface to 3 m in depth. Some areas contain up to 10 m of high resistivity material, which is interpreted as either colluvial deposition (in areas of steeper terrain), or reworked till/channel material, washing any finer clay sediment out of the matrix. Evidence of this was seen in locations where electrode placement was noticeably gritty during insertion, as well as areas with increased boulders seen at the surface. Whether any of these reworked areas are worth exploring is hard to say, but any historical information on reworked material (interpreted as larger grain material and boulders overtop of a clay rich layer) would be useful for exploration potential. Areas showing potential for significant reworked channels will be outlined in the Recommendations section.

11.1.1 Line 01 Resistivity

2D Resistivity, Dipole-Dipoearray
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 8 2020

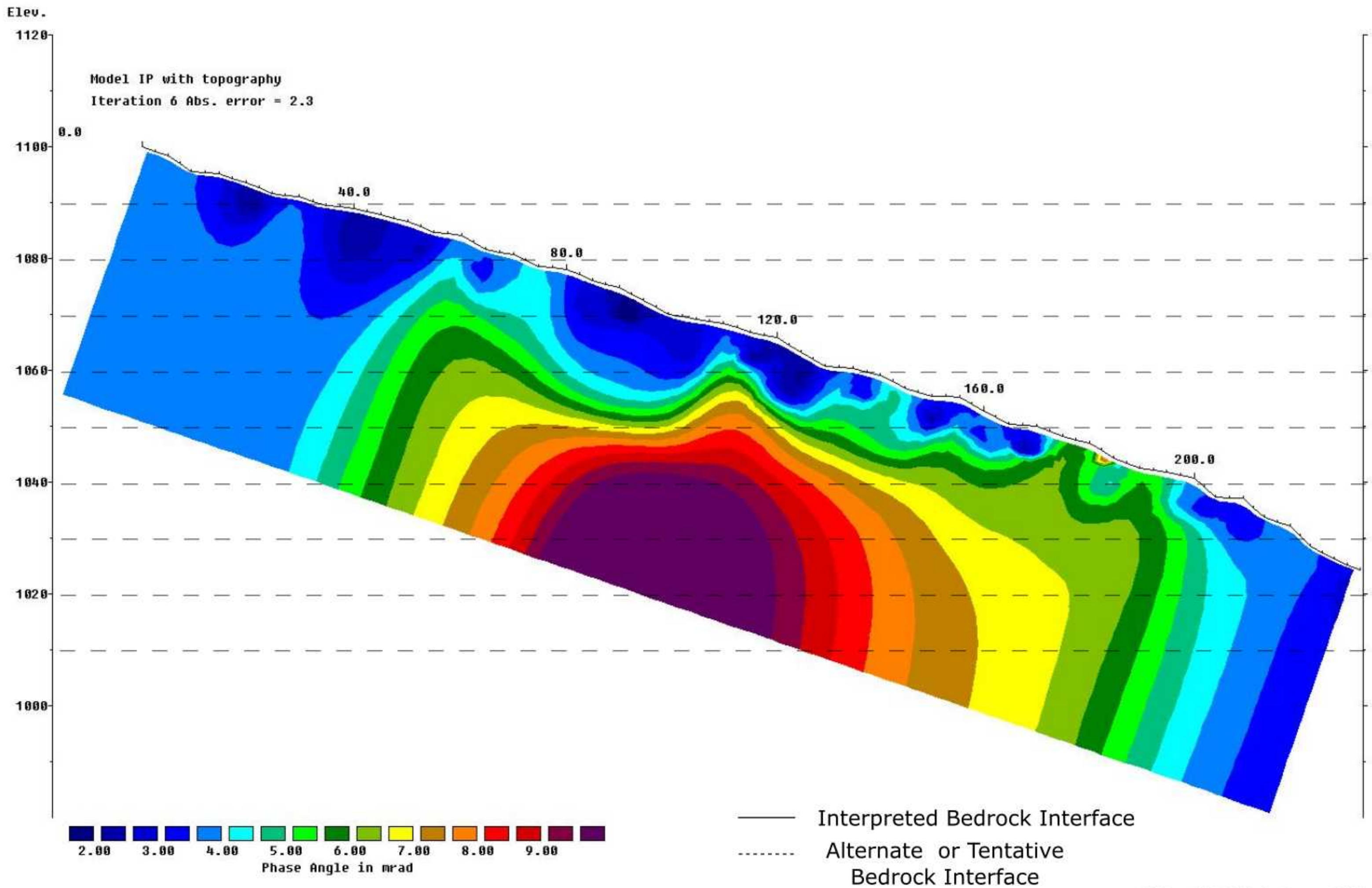


This 2D Resistivity measuring result is an interpretation of geophysics data.We recommend the verification of the profile interpretation with test pits, drilling, or shafting

PO Box 31402 Main Street, Whitehorse, YT, Y1A 6K8
Phone 867 456 4343 (Office)
info@borealgeosciences.ca / www.borealgeosciences.ca

11.1.2 Line 01 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoearray
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 8 2020



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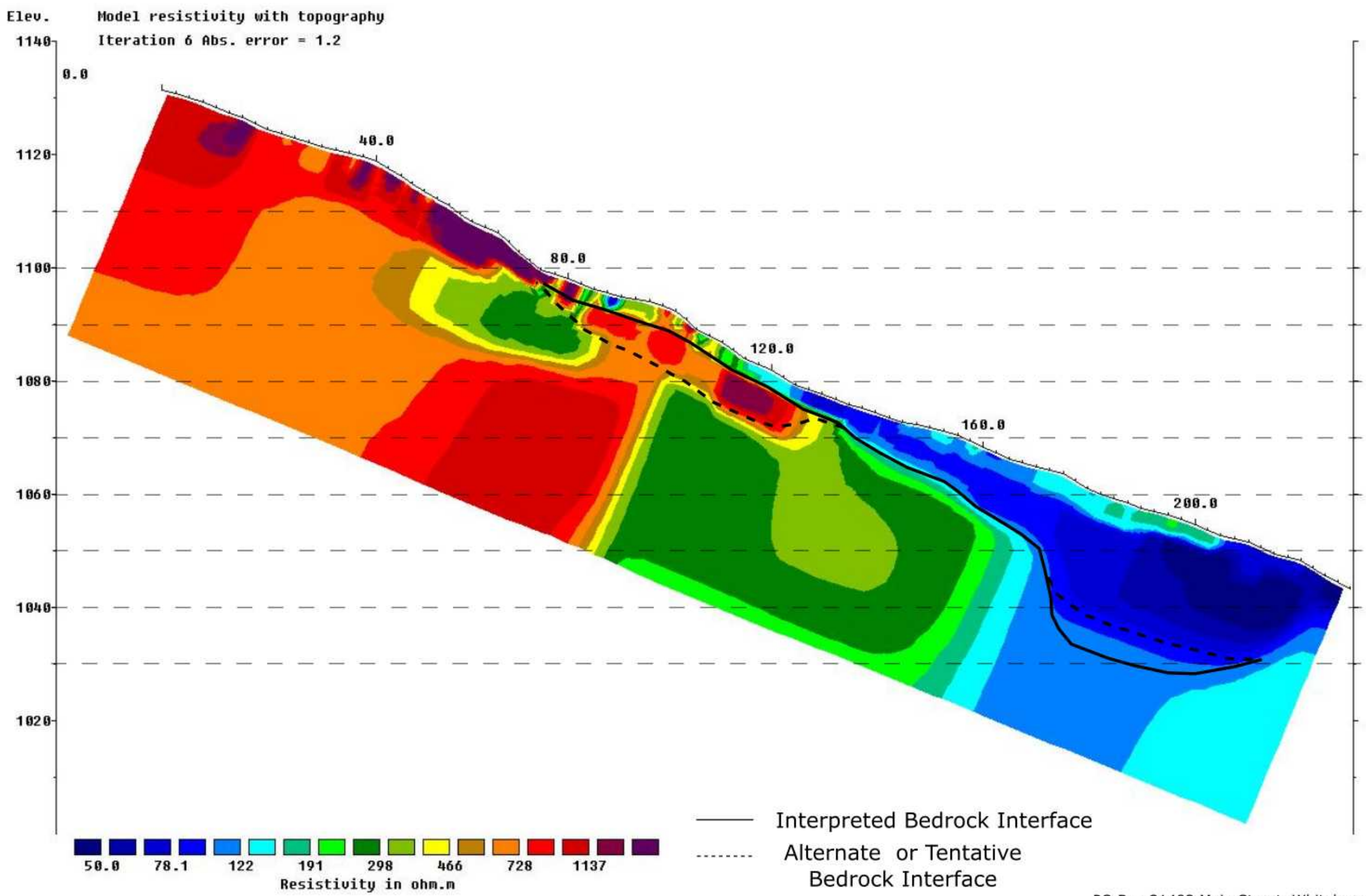
11.2.1 Line 02 Resistivity

2D Resistivity, Dipole-Dipoearray
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 9 2020



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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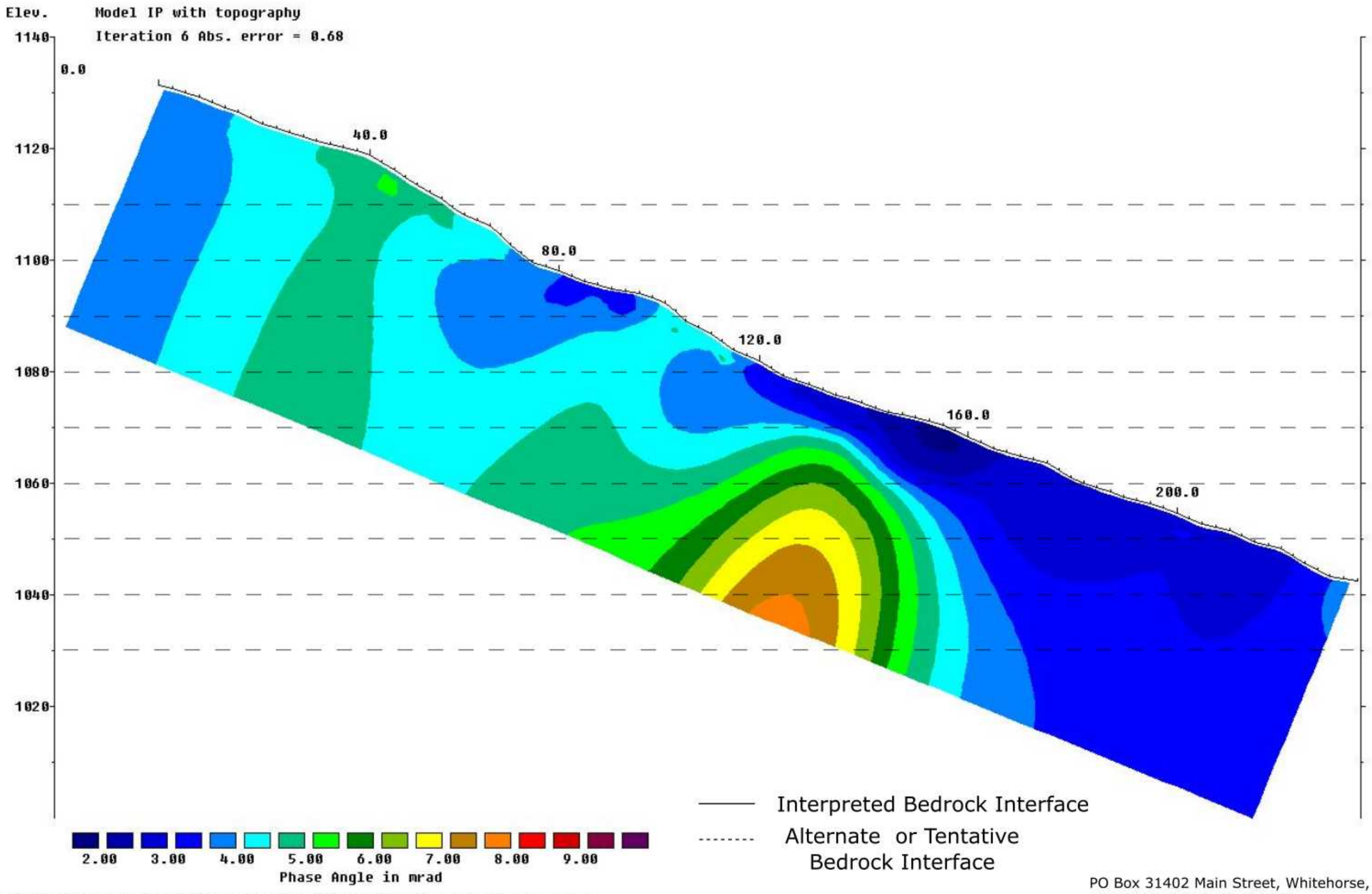
11.2.2 Line 02 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoearray
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 9 2020



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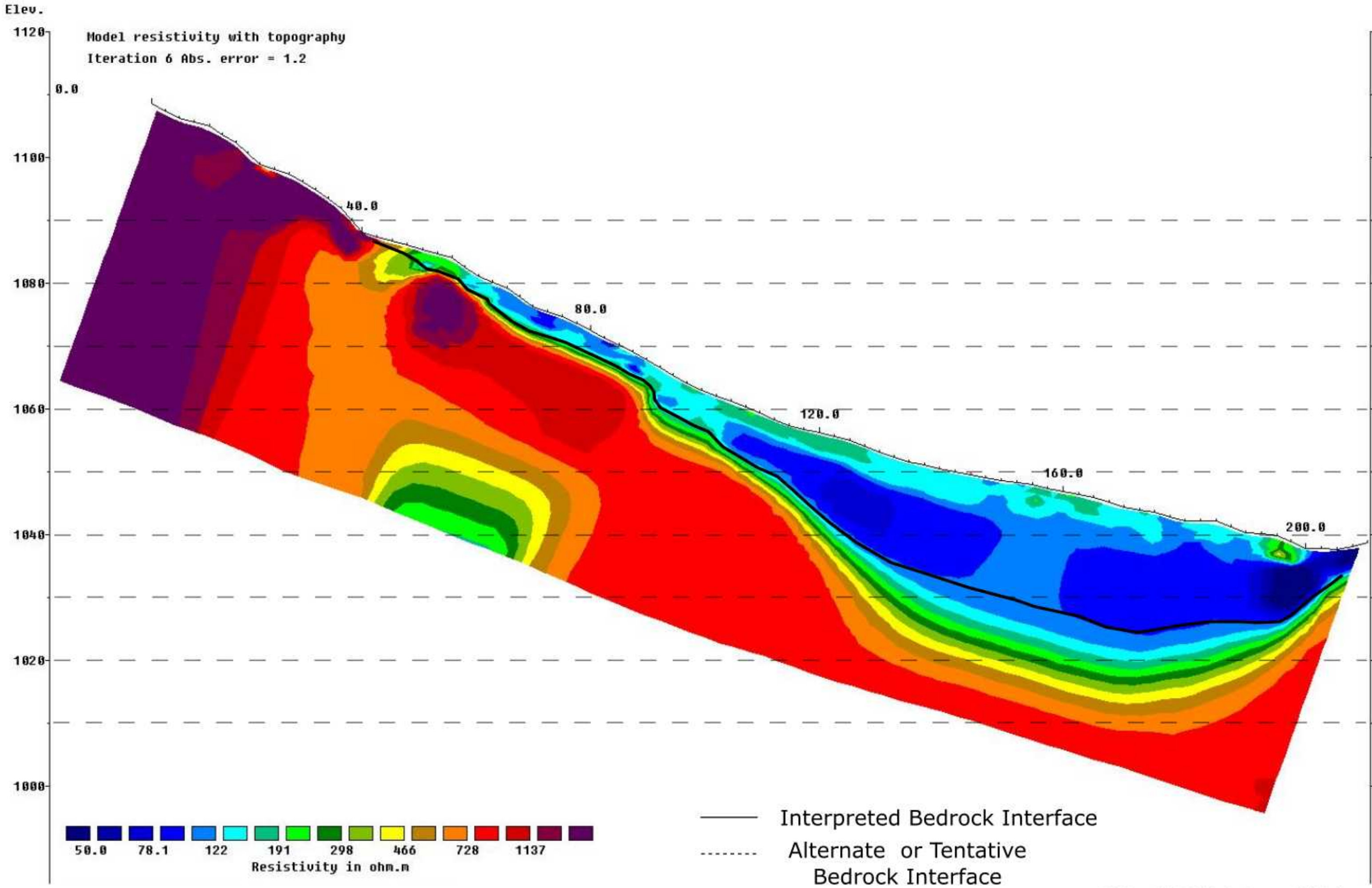
11.3.1 Line 03 Resistivity

2D Resistivity, Dipole-Dipoe array
42 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 9 2020



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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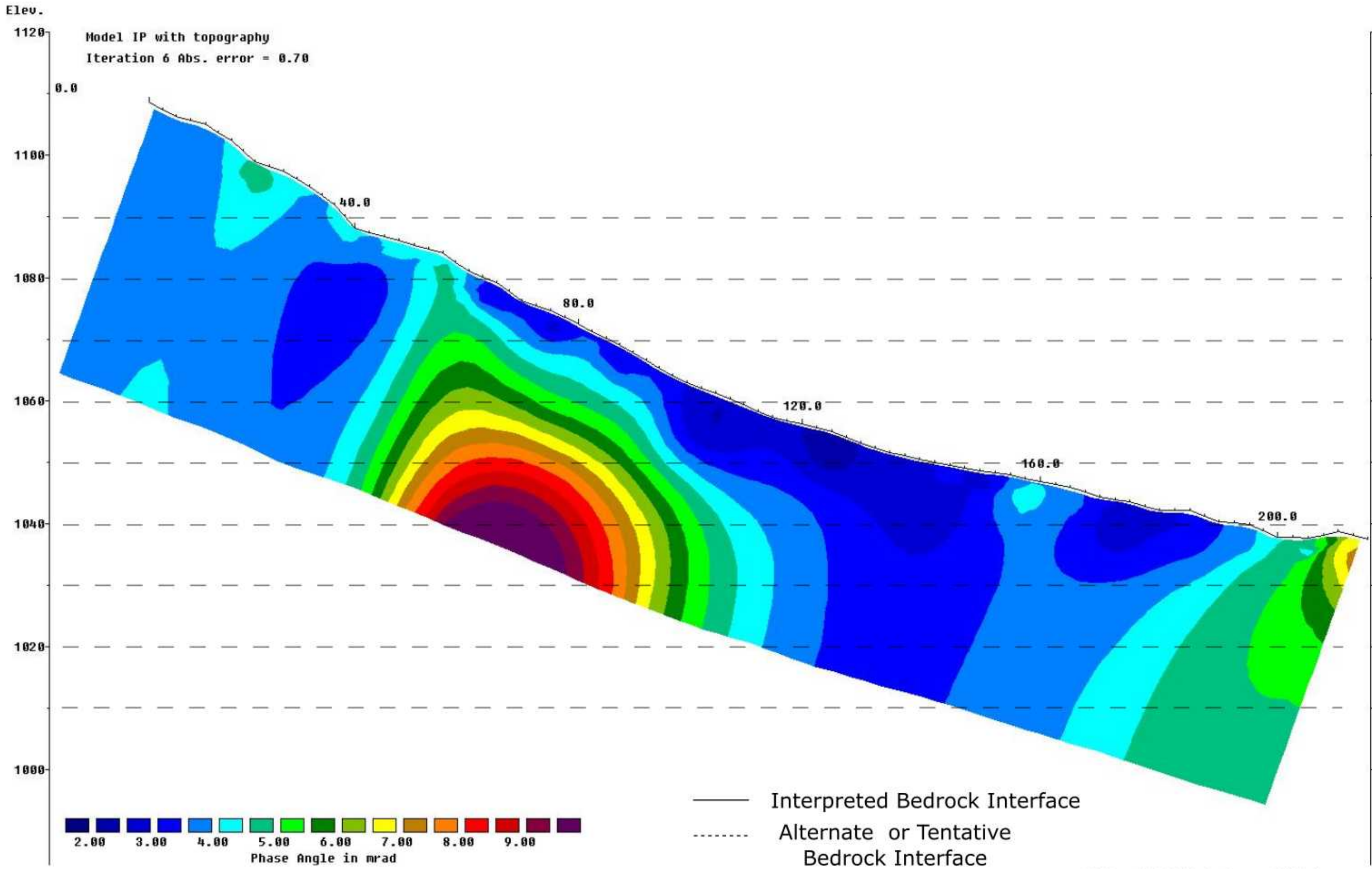
11.3.2 Line 03 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
42 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 9 2020



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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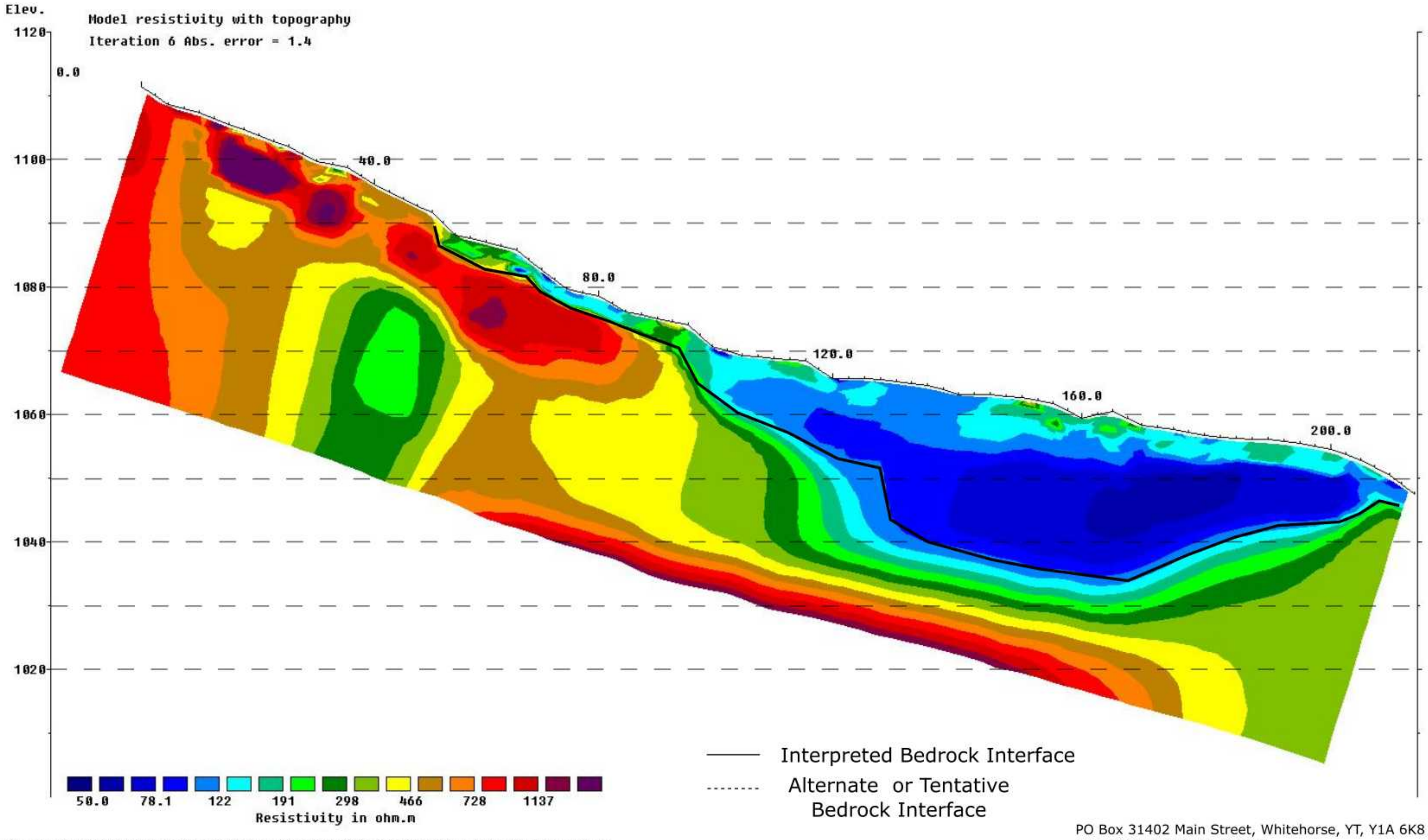
11.4.1 Line 04 Resistivity

2D Resistivity, Dipole-Dipoe array
42 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 10, 2020



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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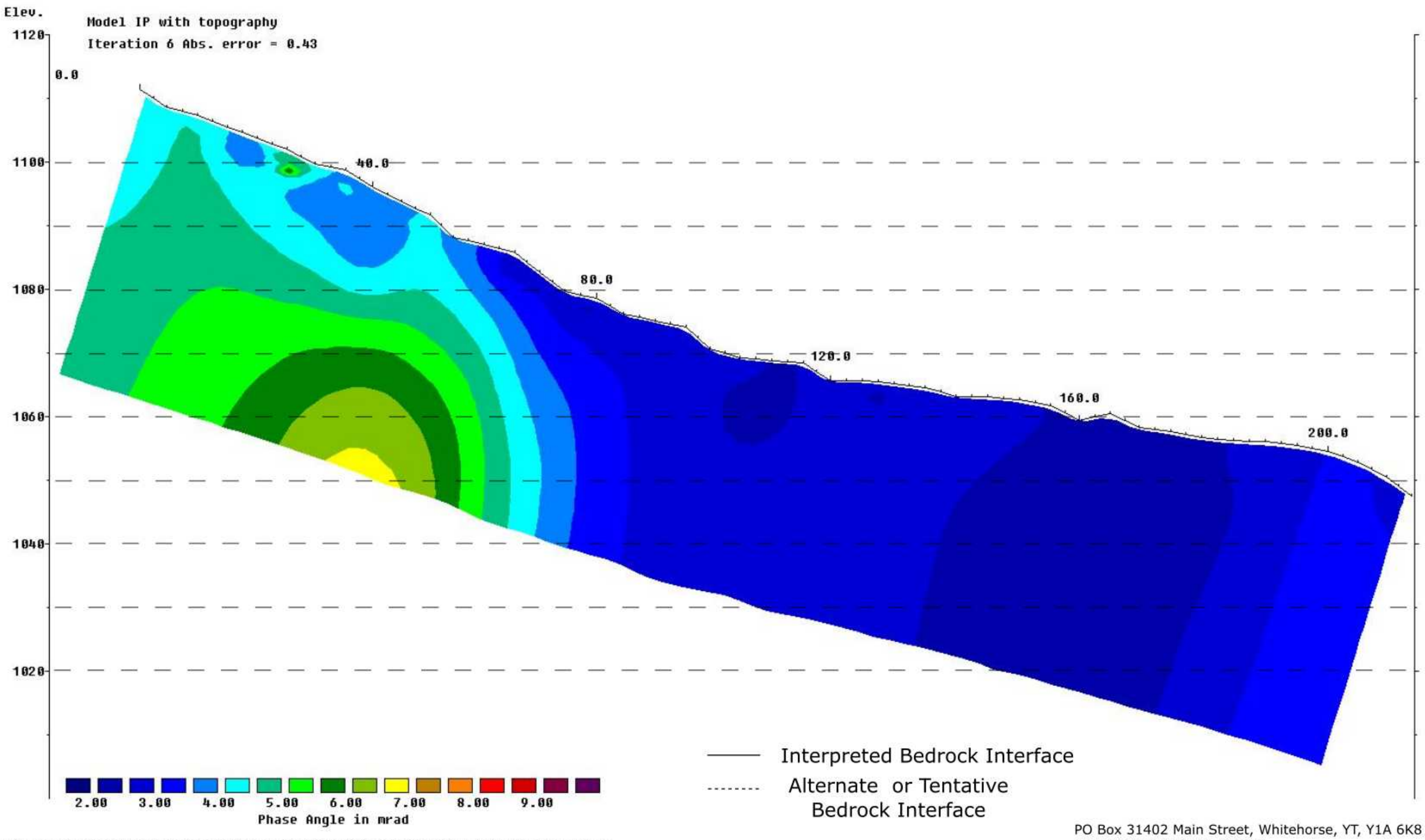
11.4.2 Line 04 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
42 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 09, 2020



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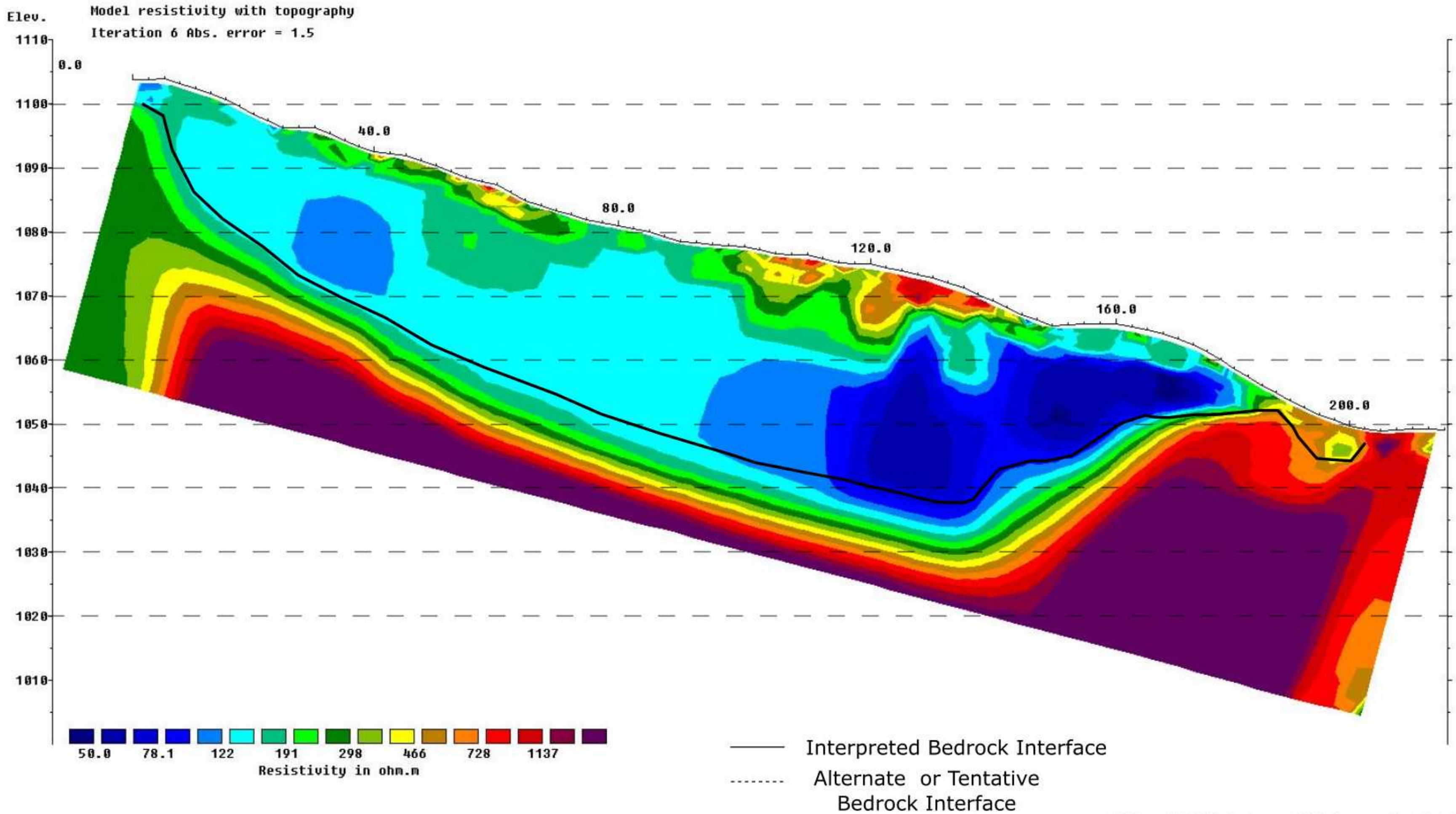
11.5.1 Line 05 Resistivity

2D Resistivity, Dipole-Dipoe array
43 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 10, 2020



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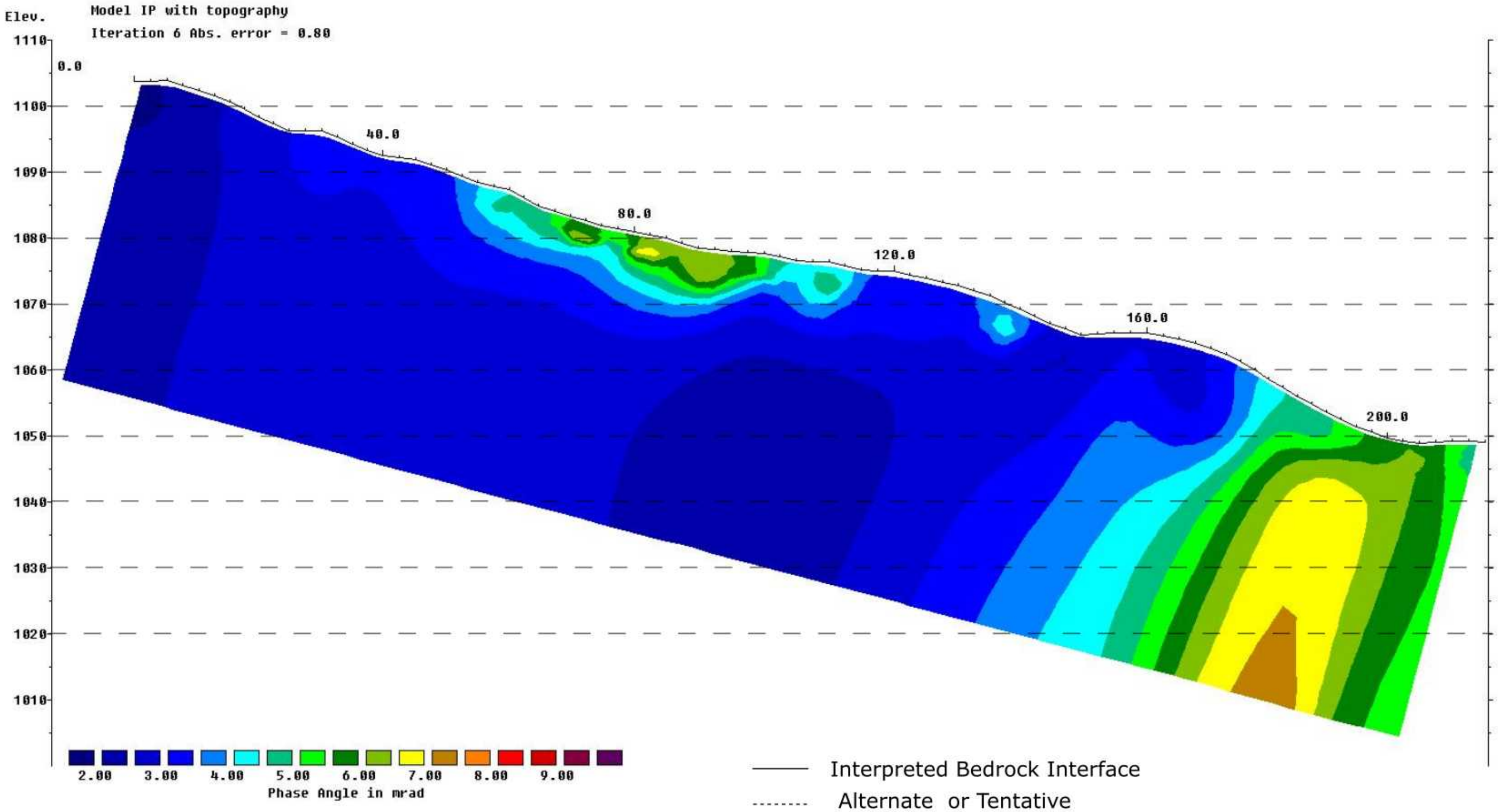
info@borealgeosciences.ca / www.borealgeosciences.ca

11.5.2 Line 05 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
43 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 10, 2020



Interpreted Bedrock Interface

Alternate or Tentative Bedrock Interface

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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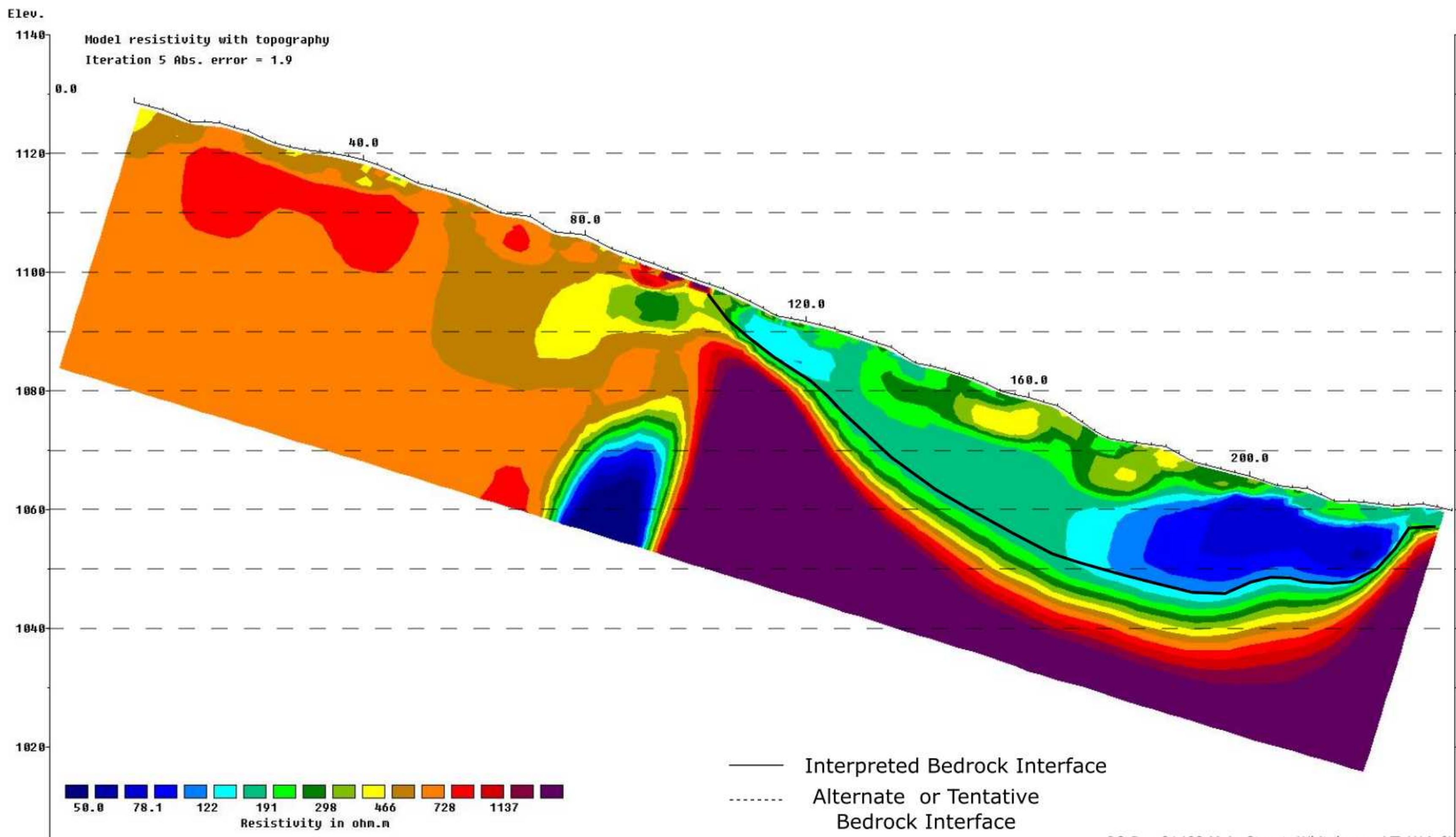
11.6.1 Line 06 Resistivity

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 10, 2020



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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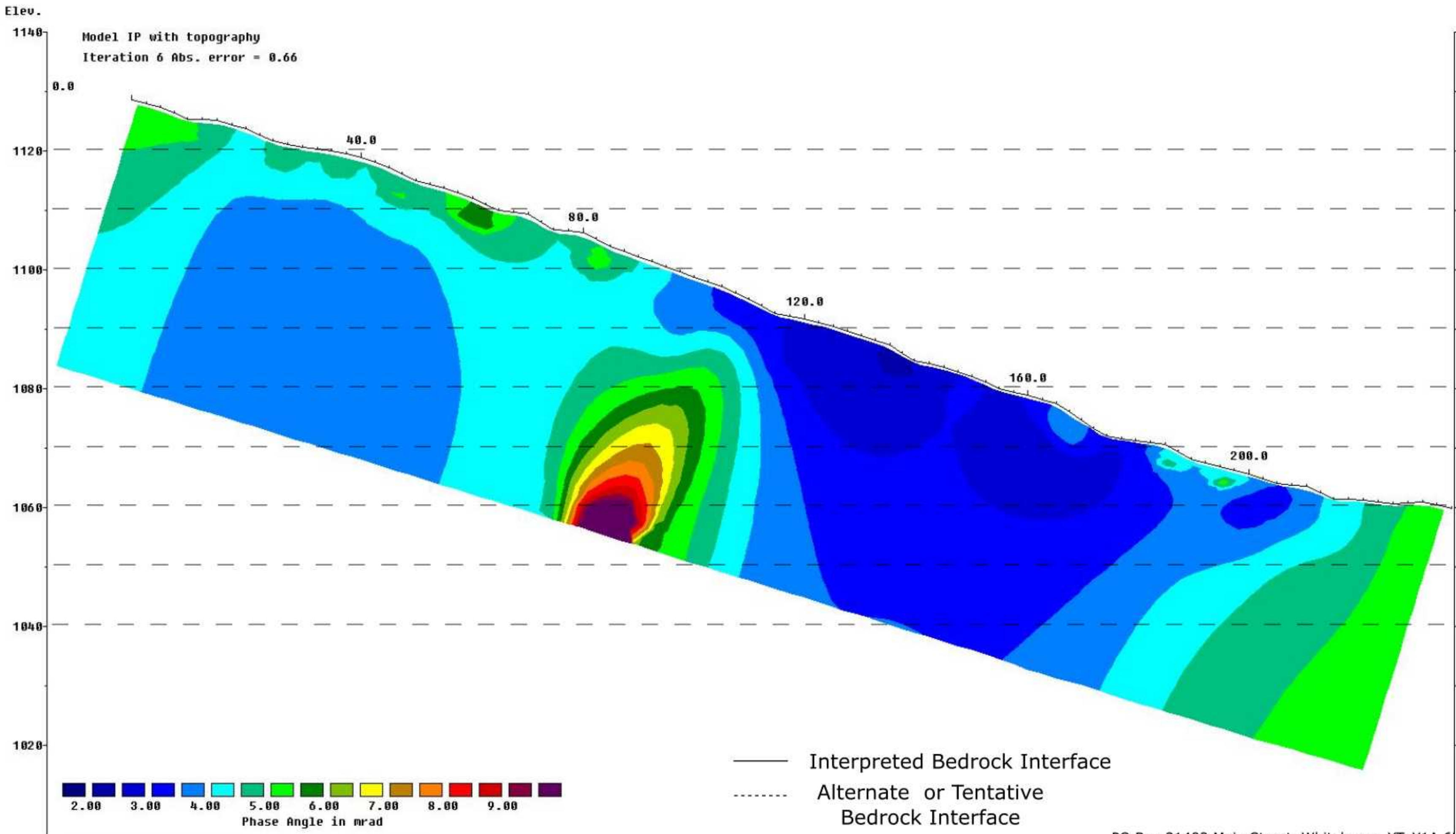
11.6.2 Line 06 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 10, 2020



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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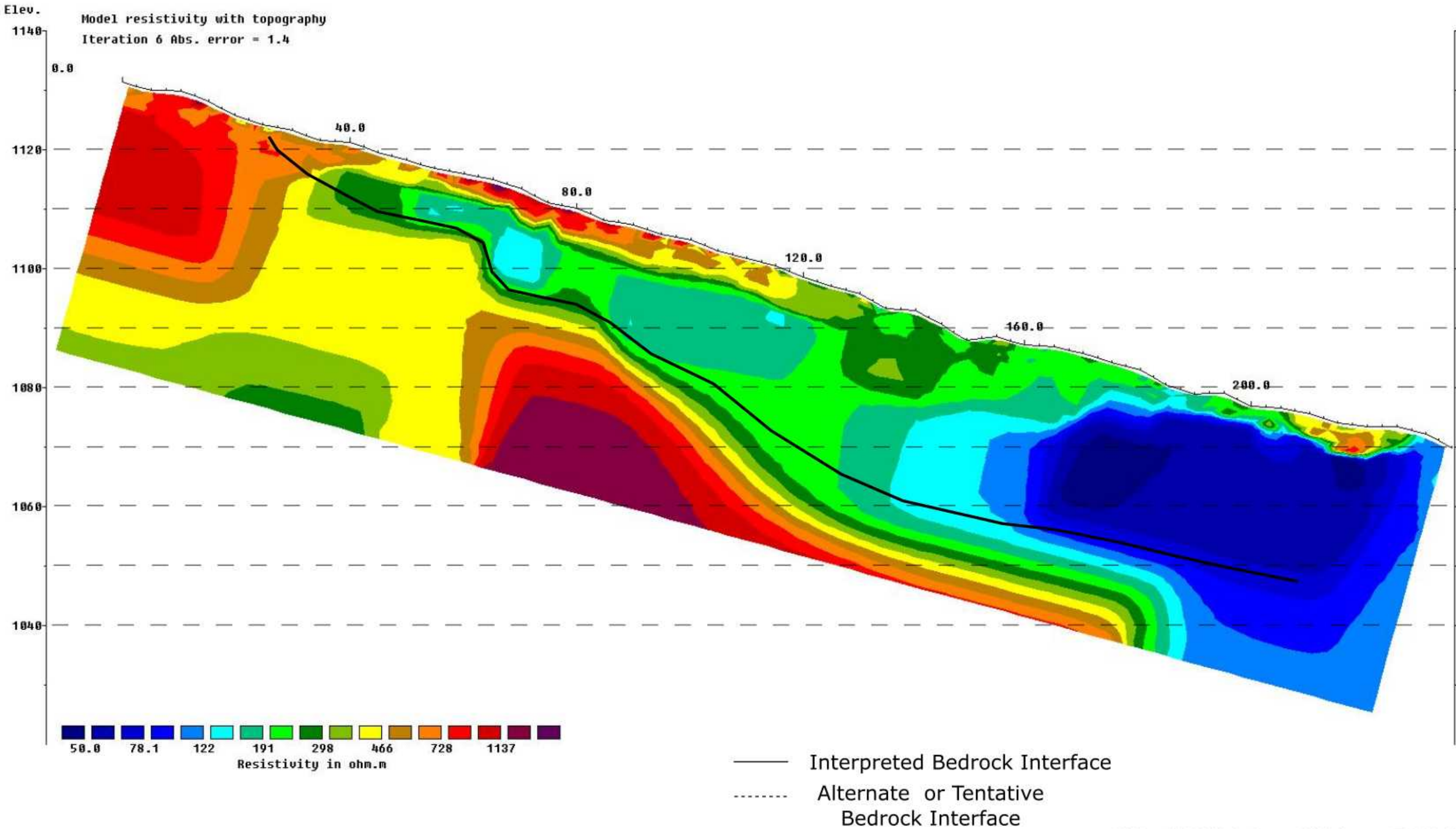
11.7.1 Line 07 Resistivity

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 10, 2020



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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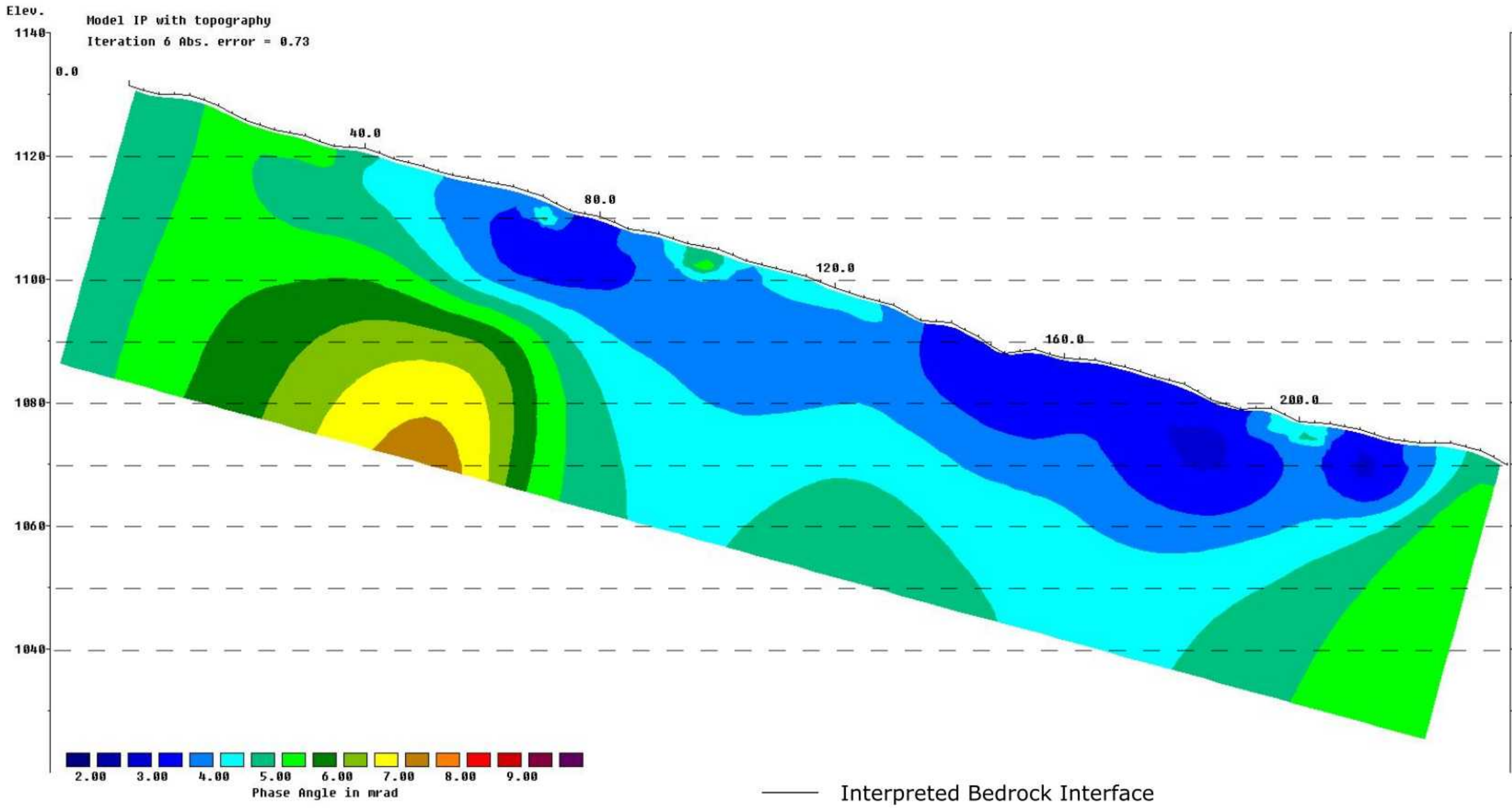
11.7.2 Line 07 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 10, 2020



——— Interpreted Bedrock Interface

-------- Alternate or Tentative Bedrock Interface

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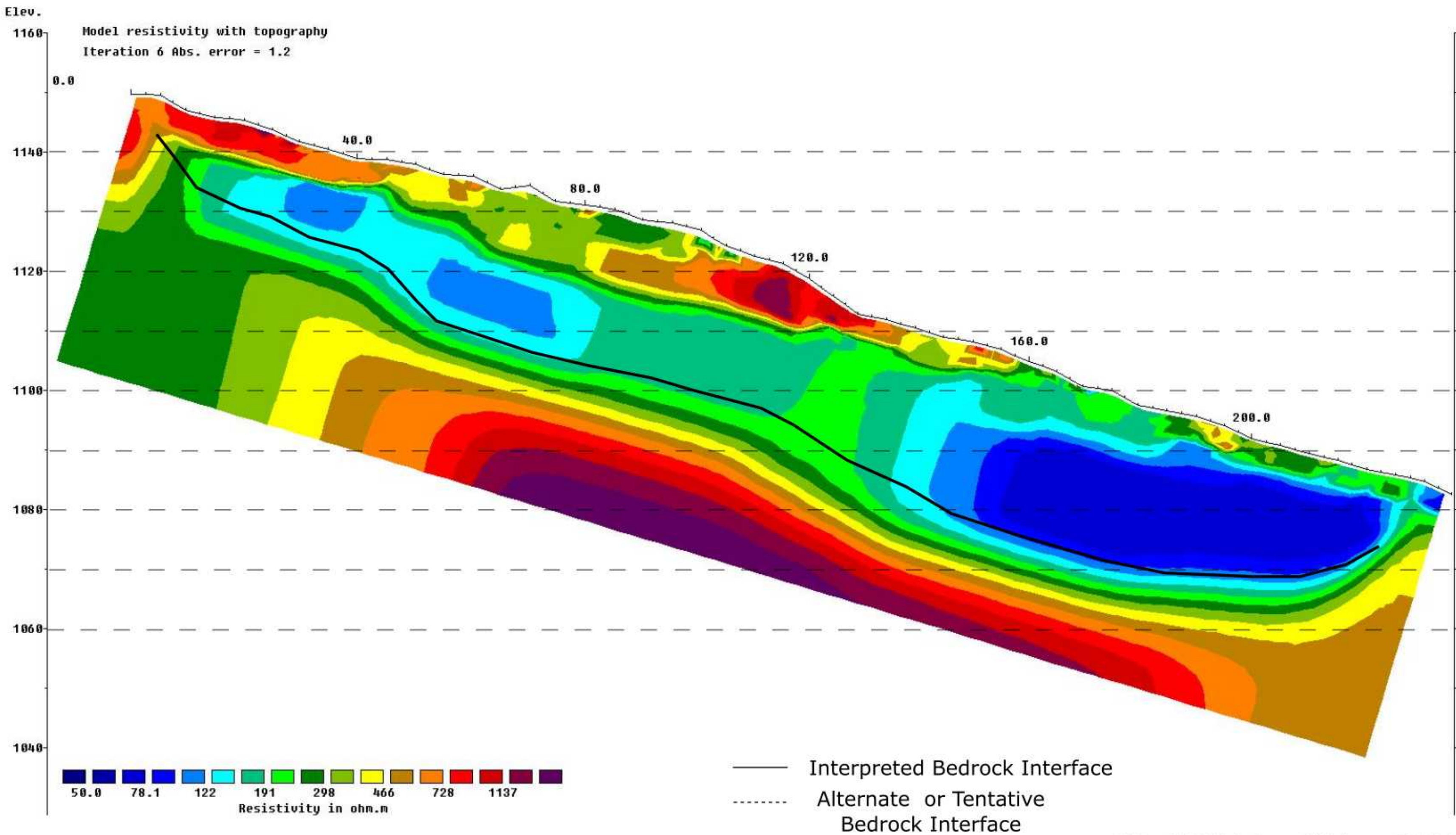
11.8.1 Line 08 Resistivity

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 11, 2020



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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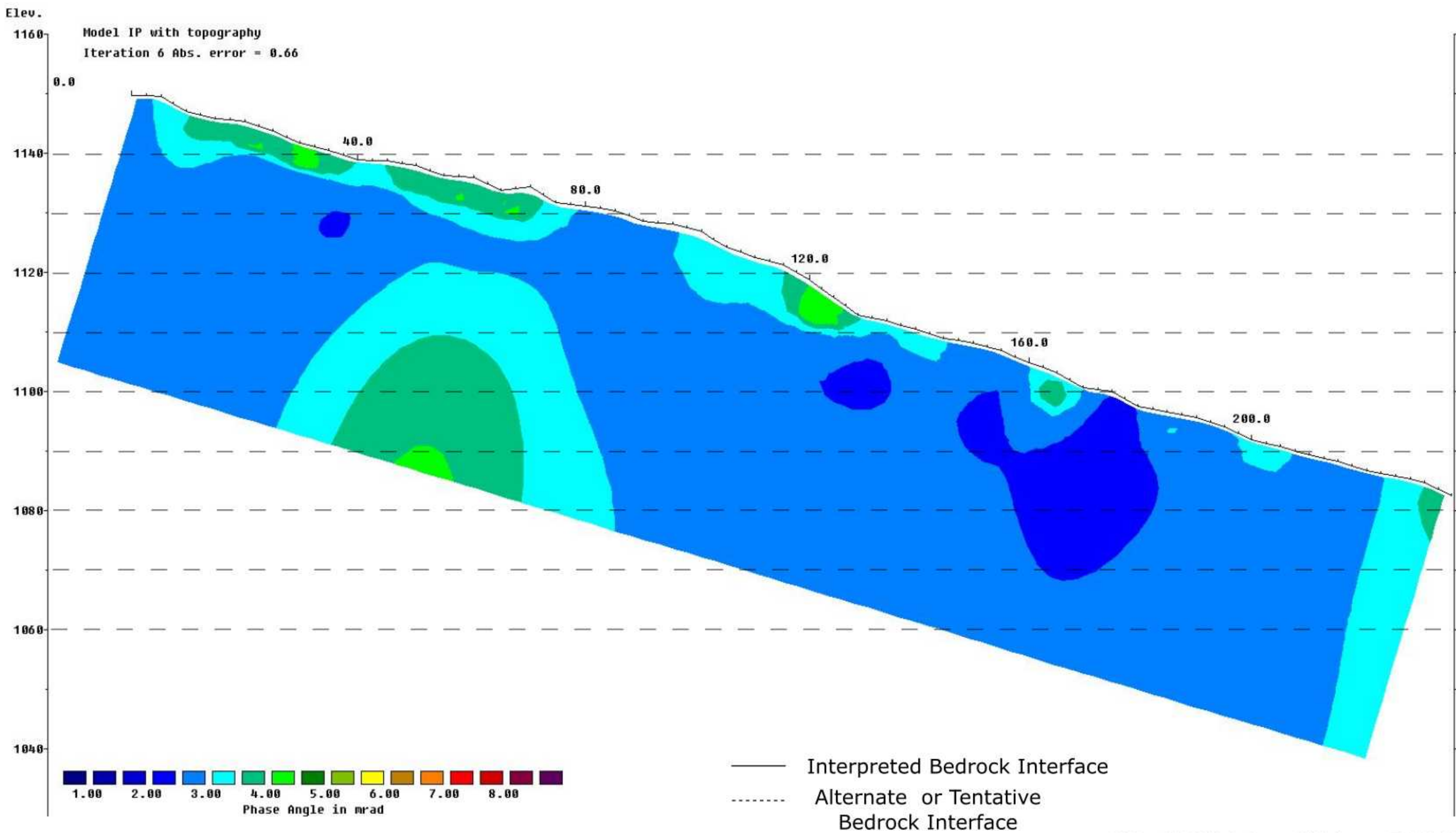
11.8.2 Line 08 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 11, 2020



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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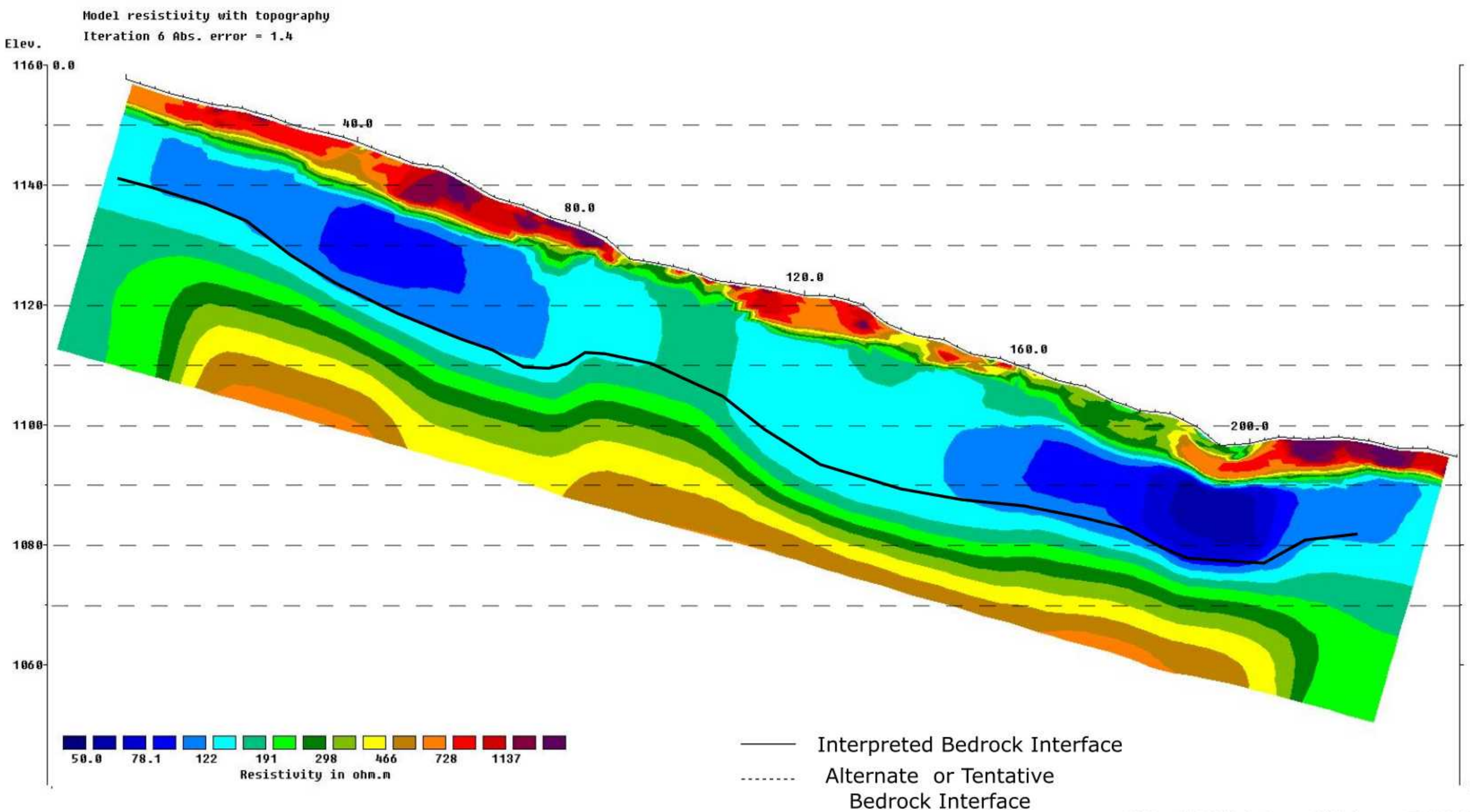
11.9.1 Line 09 Resistivity

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 11, 2020



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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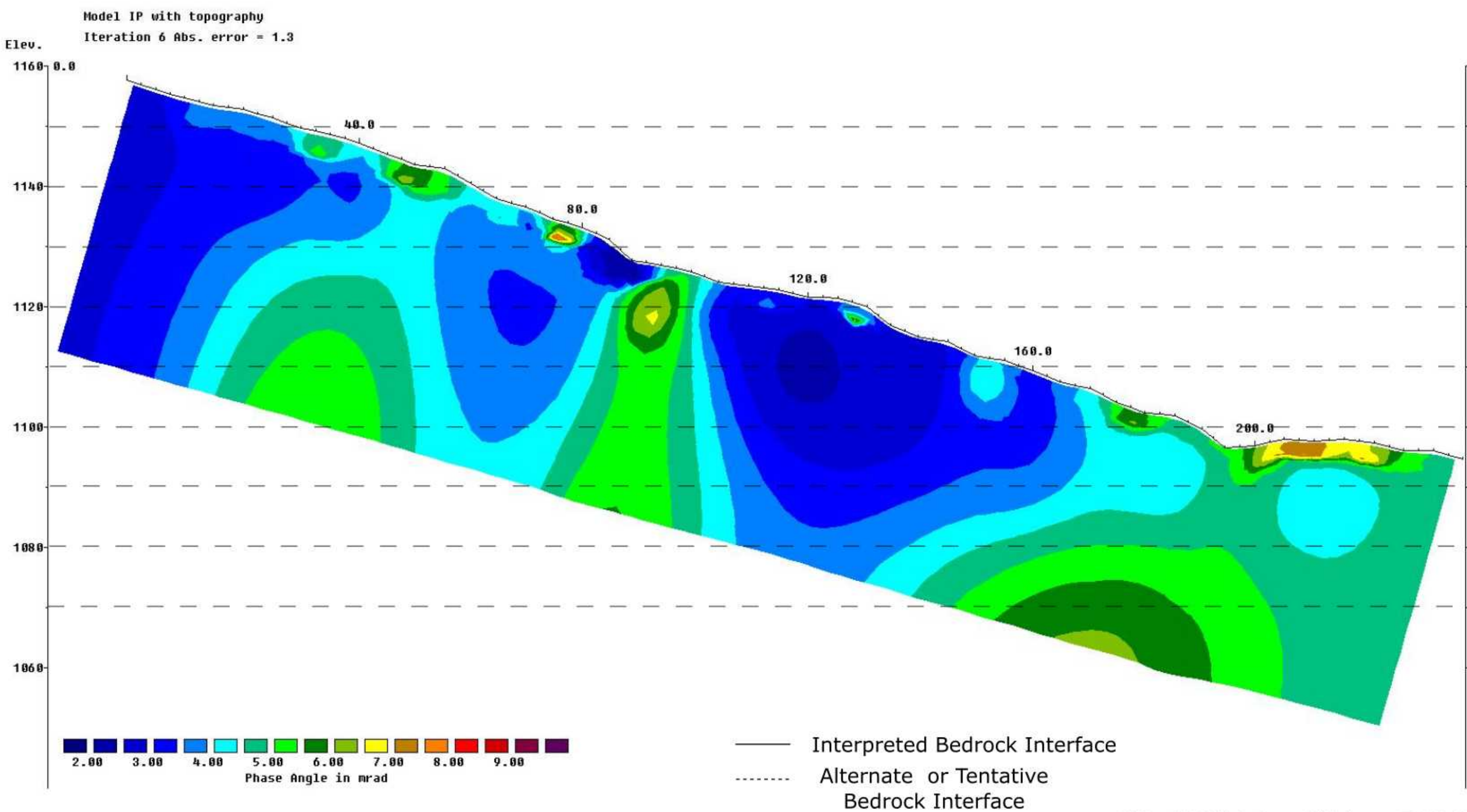
11.9.2 Line 09 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 11, 2020



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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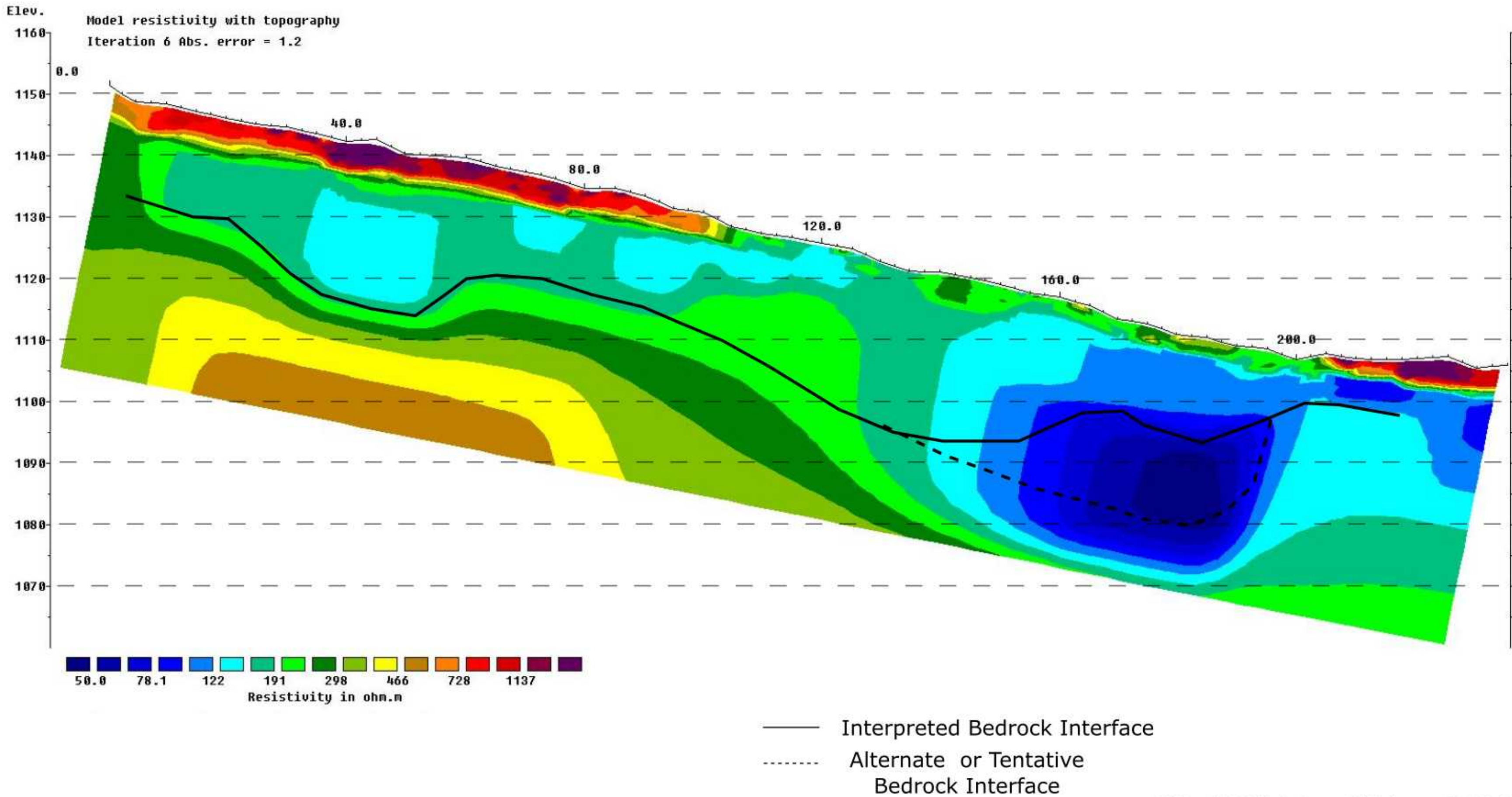
11.10.1 Line 10 Resistivity

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 11, 2020



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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11.10.2 Line 10 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 11, 2020

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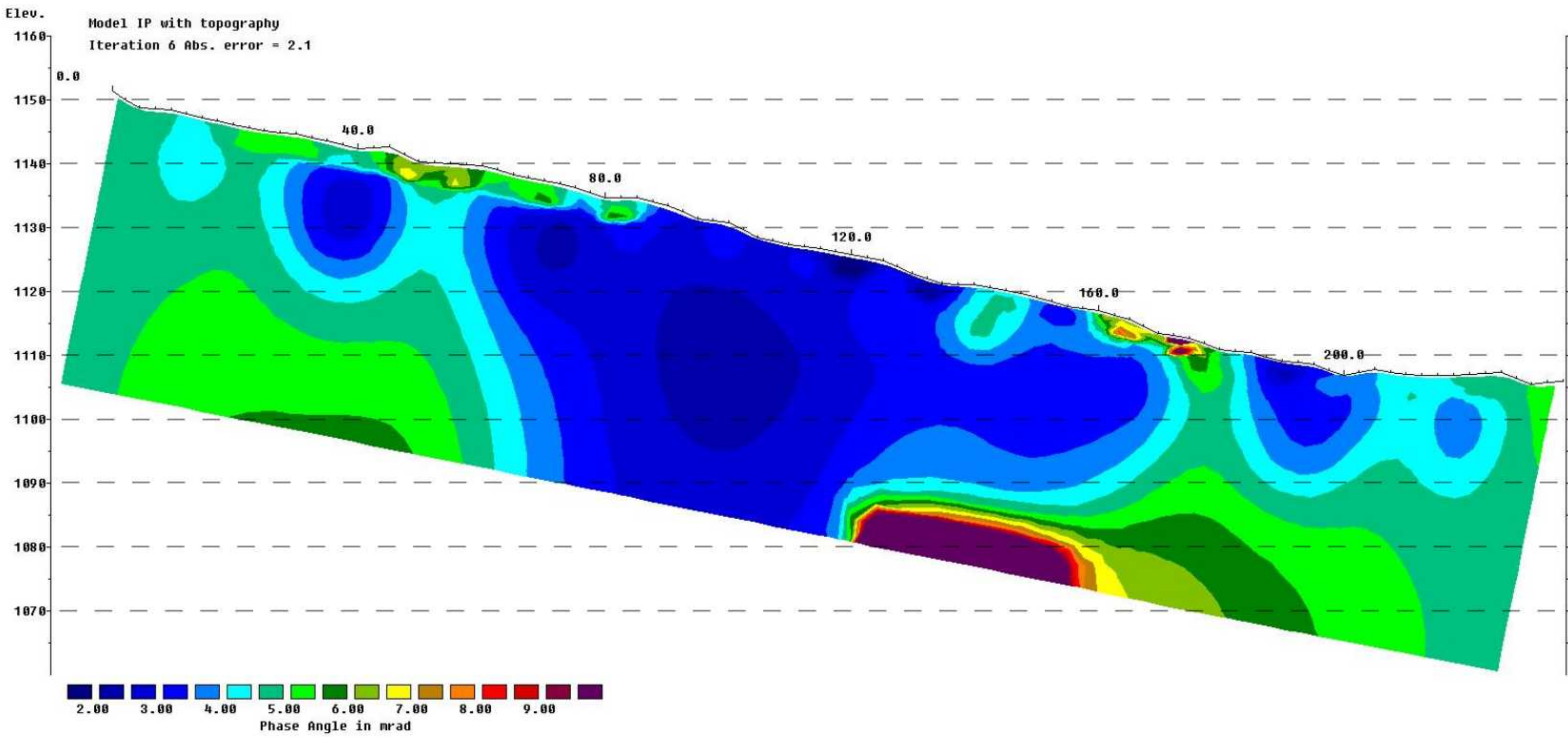

——— Interpreted Bedrock Interface

-------- Alternate or Tentative Bedrock Interface

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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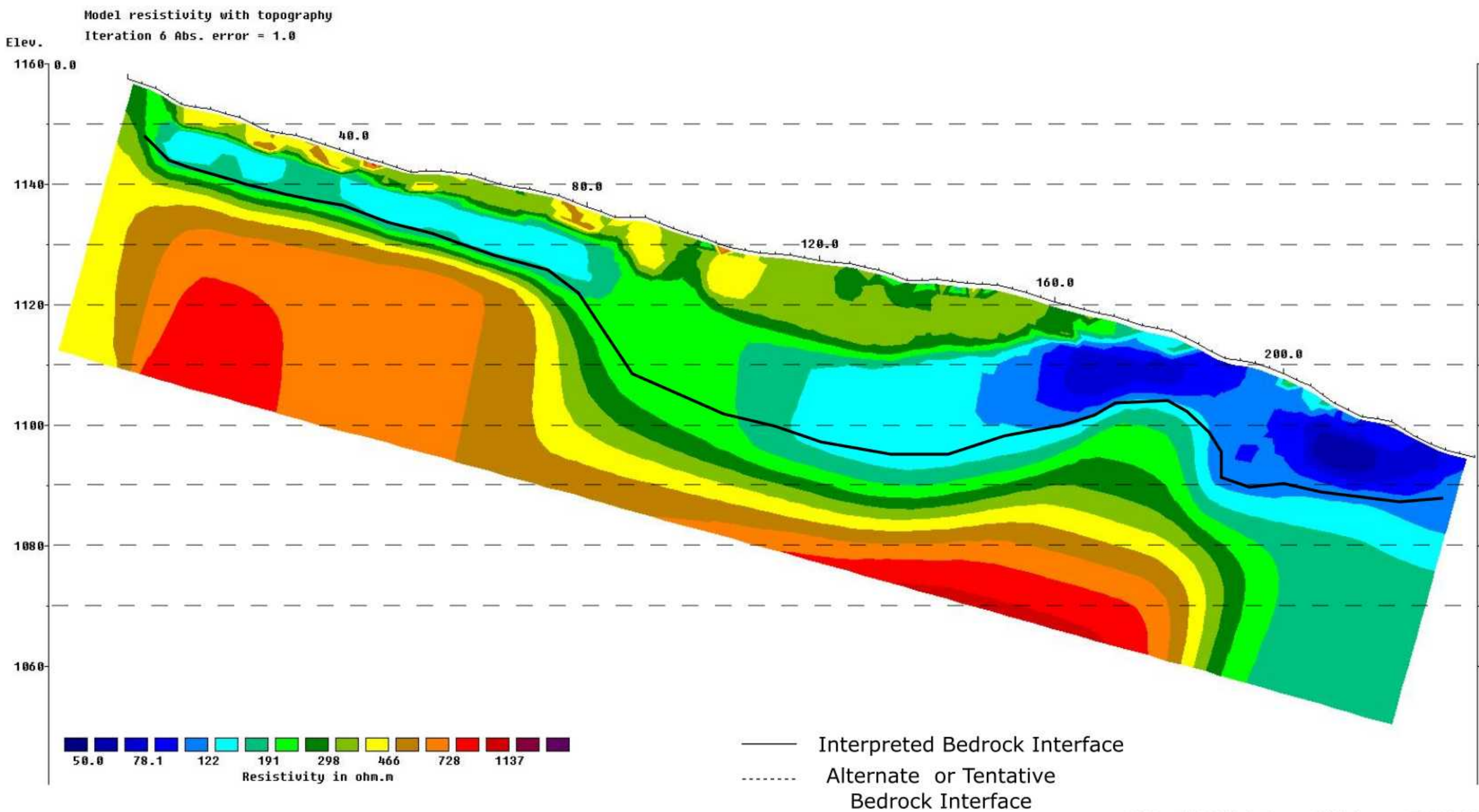
11.11.1 Line 11 Resistivity

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 12, 2020



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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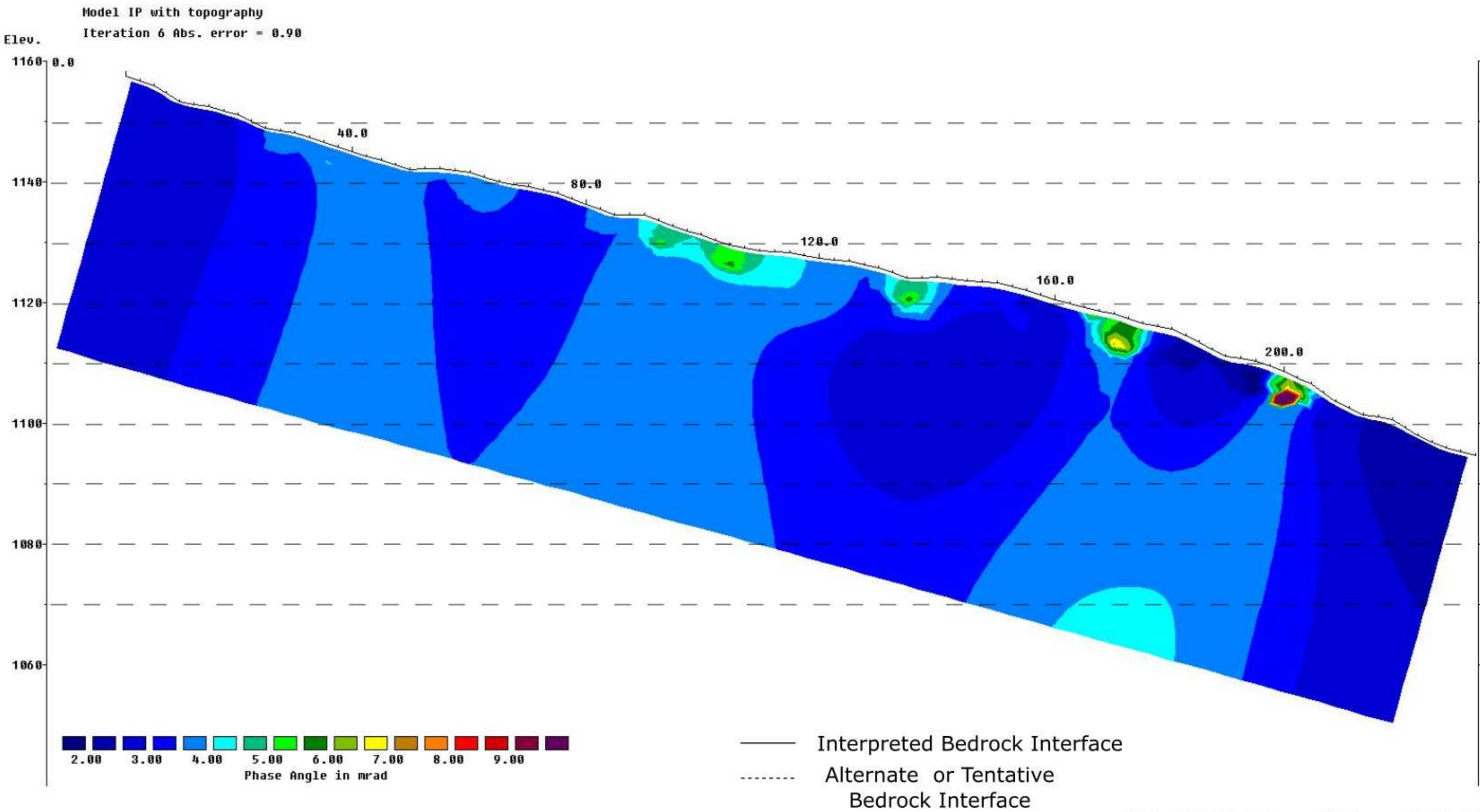
11.11.2 Line 11 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 12, 2020



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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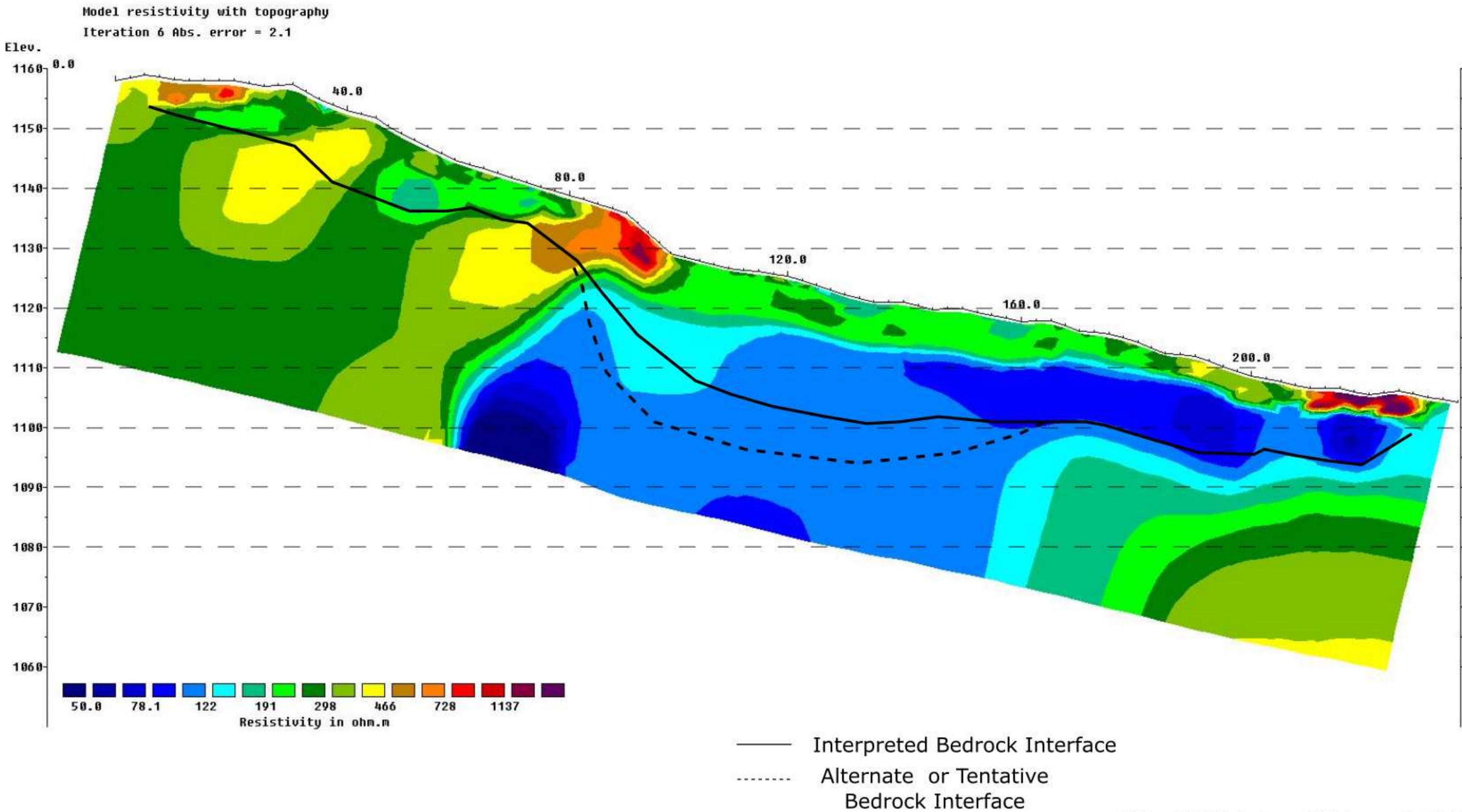
11.12.1 Line 12 Resistivity

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 12, 2020



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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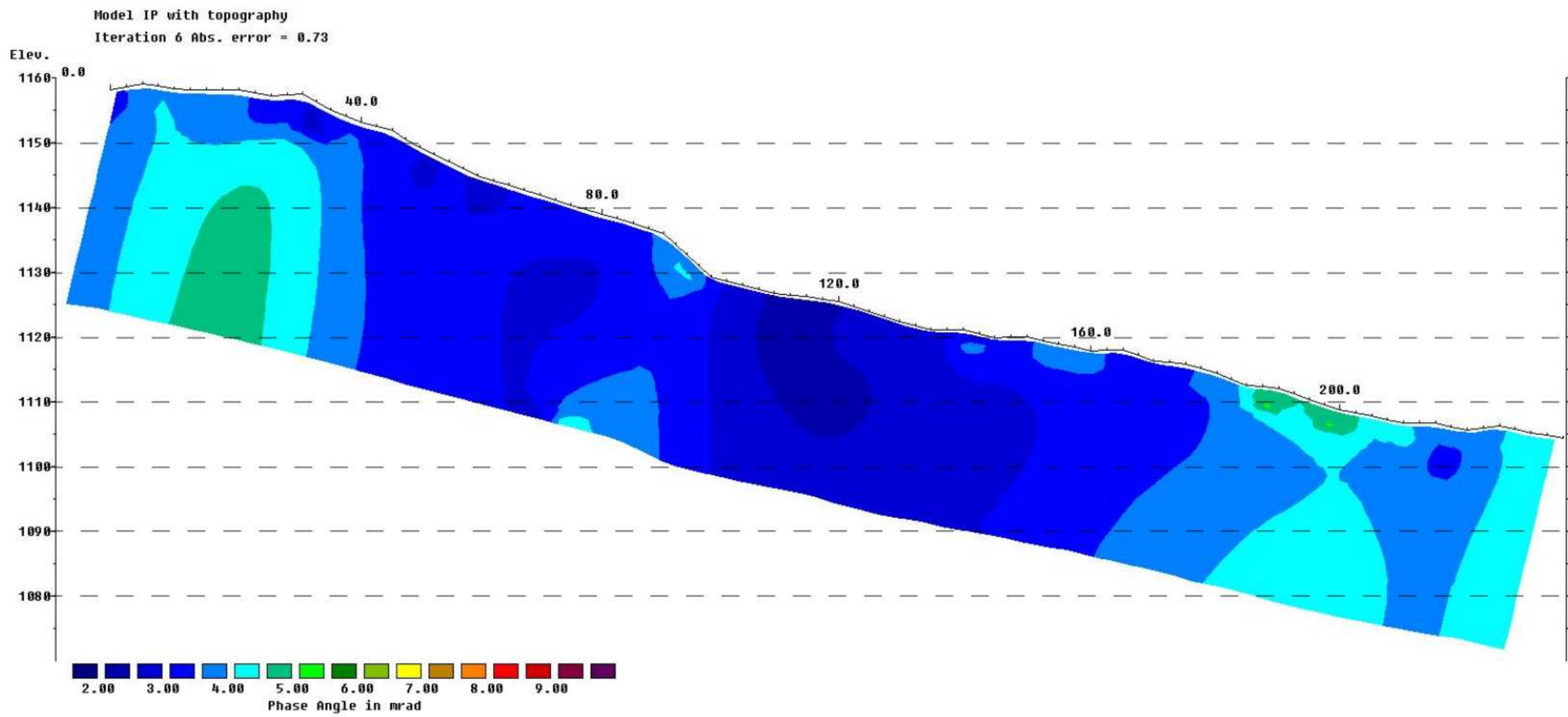
11.12.2 Line 12 Induced Polarization (IP)

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 12, 2020



——— Interpreted Bedrock Interface

-------- Alternate or Tentative Bedrock Interface

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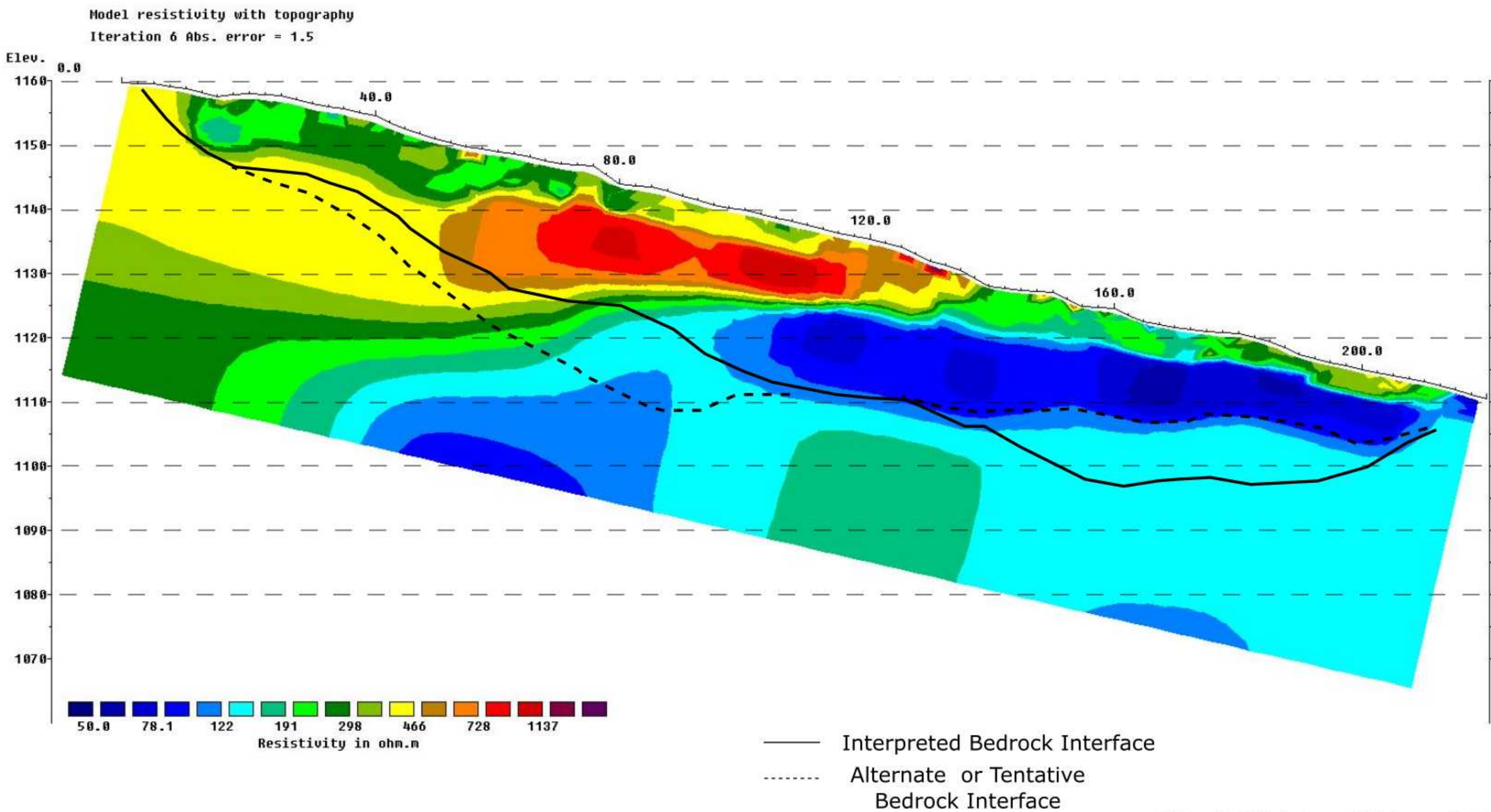
11.13.1 Line 13 Resistivity

2D Resistivity, Dipole-Dipoe array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, September 12, 2020



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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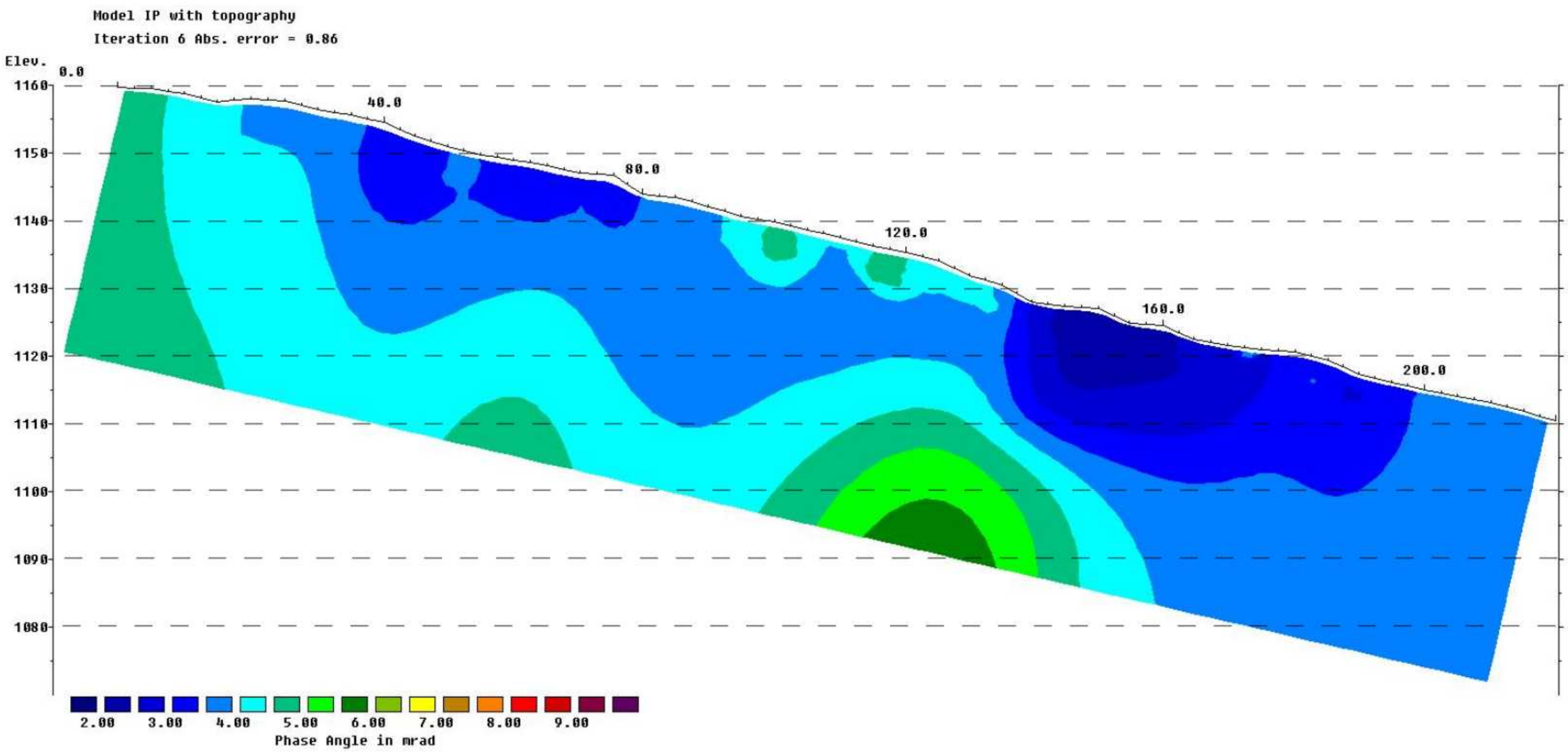
11.13.2 Line 13 Induced Polarization (IP)

2D Resistivity, Dipole - Dipole array
48 Electrodes: Spacing 5m
Horizontal and vertical measure in [meters]
Vertical exaggeration in model section display: 1.0
Data Acquisition: David Storm, Jessica Pickett, 12 September, 2020



Interpreted Bedrock Interface

Alternate or Tentative Bedrock Interface

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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12 Discussion

Consistent patterns in Resistivity and IP anomalies are seen throughout the survey. While the geologic handles of these patterns can only be speculated on until more information can be gathered, but what we do know is that the area was glaciated and that fluvial processes are likely high energy due to the down cutting seen in the previously mined areas. Although we can only see half of the valley in this survey, the variation in features can give insight as to whether there are features worth further exploration. Figure 08 and Figure 09 have arranged the profiles to help visualize feature variation and continuity. (Explanation on following page)

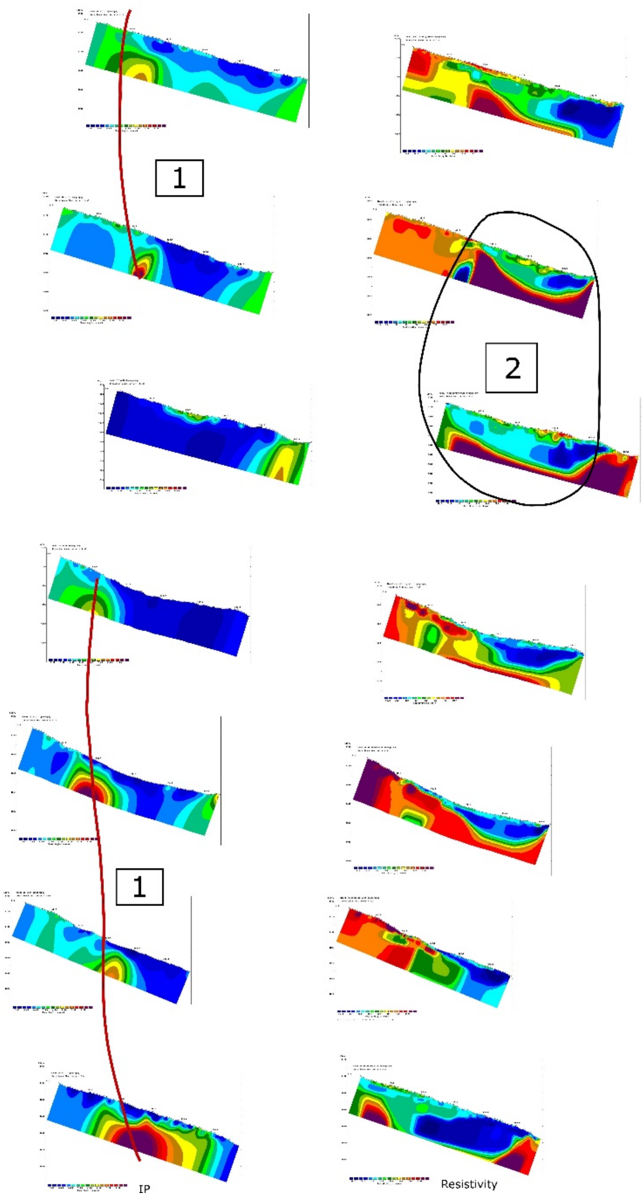


Figure 08: Line 01 – 07 (in sequential order traveling up valley from text).

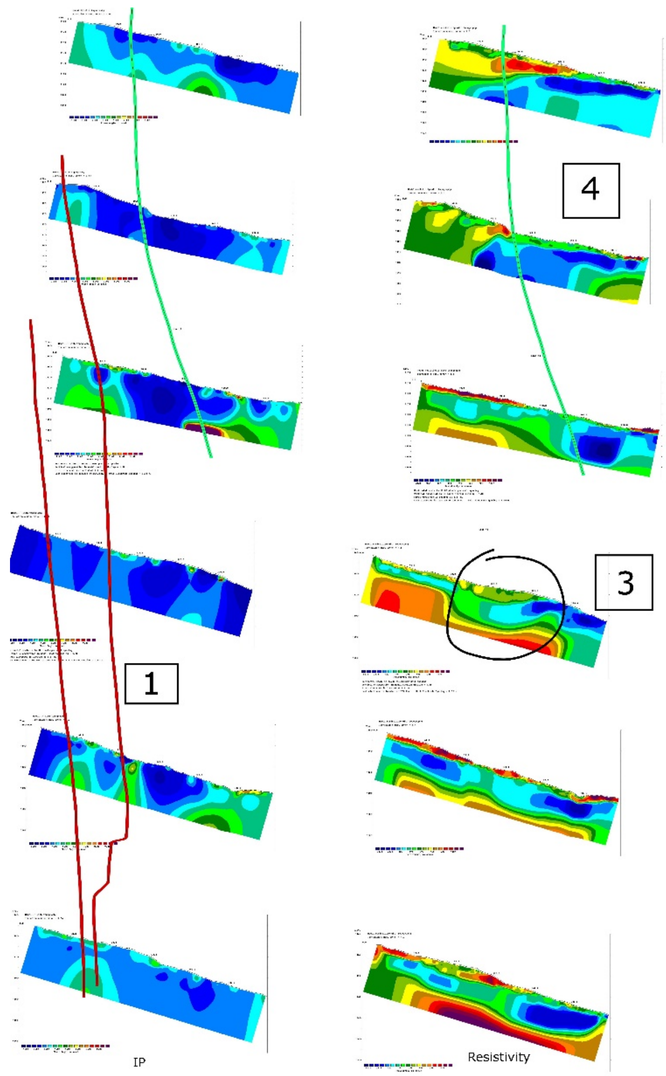


Figure 09: Line 08 – 13 (in sequential order traveling up valley from text).

Bedrock Anomalies

1 - Feature 1 (Figure 08 and Figure 09): The lines drawn represent likely faulting correlations. The resistivity scale changes with each fault, as explained in the Interpretation section, but similar shape and correlation to resistivity patterns are present. The faults in are suspected to follow a similar trajectory as that of the mapped fault running up the valley (Map 02). IP activity also changes in these faults which may present an opportunity to characterize possible mineralization events associated with them.

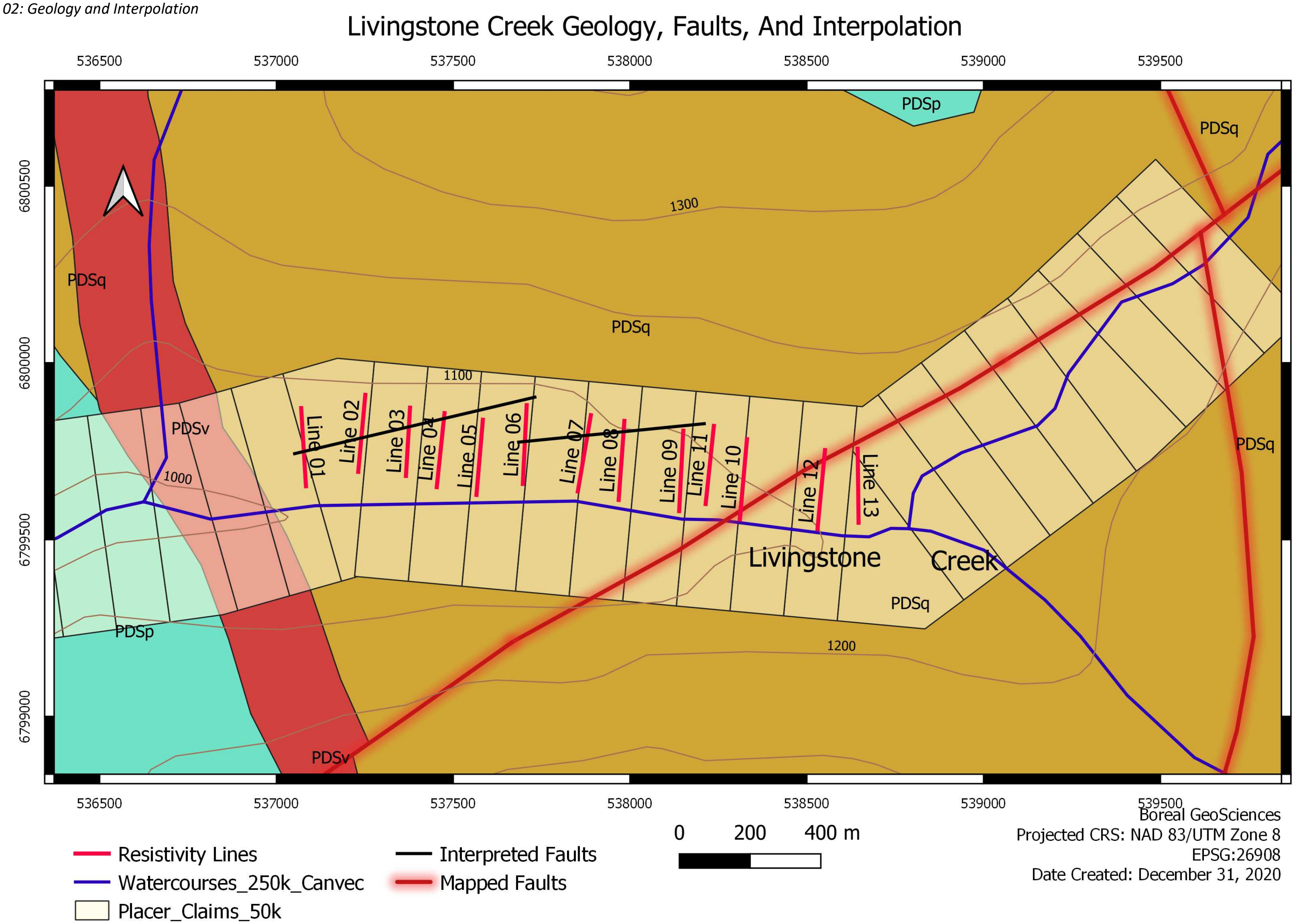
4 - Feature 4 (Figure 09): This fault structure is characterized by its resistivity correlation versus its IP correlation. The mapped fault running up Livingstone Creek runs through this low resistivity fault feature as seen on Map 02. This feature is key to the interpretation process in the recognition process of the fault structure and their correlation to any IP activity associated with it. This has helped to distinguish the large extreme low resistivity feature seen on Line 01 and Line 10. We know at least one mapped fault correlates with the feature seen on Line 10, where IP influence is apparent at its lower extent. It may still be possible that the two large extreme low resistivities are indeed anomalous overburden signatures, but there is more support for the interpretation that they are fault structures.

Overburden Anomalies

2 This overburden feature is noted due to the uncharacteristic widening on this line. As explained in the Interpretation, Line 07 is the pinch point of the bench like overburden anomaly. Line 06 then shows the fault feature prominently located at the edge of what appears to be a paleochannel that was not so distinguished in Line 07. Then, Line 05 shows that paleochannel becoming significantly wider with a second localized low resistivity on its left extent. IP shows very little activity on Line 05. There is an event that occurred between Line 06 and Line 05 that drastically changed the overburden regime. If this were a breach location for the suspected side moraine lake, it could account for a large fluvial event to degrade the area between Line 06 and Line 05, causing an initial down cut for a later paleochannel to follow. A second possibility is the direction of the fault structure seen in Line 06 caused some preferential flow direction that worked away at Line 05. Finally, the change of bounding high resistivity on the right most extent from Line 07 to Line 06 could suggest a directional change of a large paleochannel traveling from the south side of the valley to the north in this location, working at the north slope bedrock with high fluvial energy.

3 This is the most significant and anomalous dip in bedrock in the upper valley survey lines. As explained in the Interpretation, continuity up or down valley for this feature is hard to constrain as it does not develop similarly to the other multi line anomalies. Line 10 (up valley) has an anomalous dip in the bedrock on the bench that most likely developed into the bedrock anomaly seen in Line 11. The lack of a localized bedrock dip in Line 09, considering the short distance between Line 11 and Line 09, supports the possibility that this downcutting event traveled to the south side of the valley beyond Line 11. The area remains a good exploration target due to its anomalous downcutting of the bedrock in this location.

Map 02: Geology and Interpolation



13 Recommendations

The recommendations provided are geared toward conclusions, the first being confidence in interpreted features. There are shallow locations that can give enough insight into the resistivity regimes and sediment changes interpreted in the report to provide some feedback as to what may be found in deeper exploration. The second, is to help direct exploration to areas where variation in bedrock depth/elevation can cause favorable gold deposition regimes.

<u>Bench channel verification:</u>

Line 07 at the 70 – 75 m electrode location (GPS coordinates found in CSV or GPX file) will have a few meters of colluvial material, but there should be a clear sediment change and clay rich channel material to the bedrock interface.

<u>High resistivity reconcentration channels, relatively clay poor:</u>

Line 06 at 180 m, Line 07 at 135 m, and Line 11 at 135 m. These are locations where increased resistivity from the surface to 15 m (varies on each line) shows high resistivity and channel like localization and downcutting in the overburden underneath it. This is interpreted as side moraine material, which is not very likely to have a concentration of gold as fluvial events would be less likely in these areas.

<u>Significant deepening of main channel:</u>

Line 01 from 160 – 195 m (Not high priority as evidence for the large low resistivity further up the hillslope being bedrock is not guaranteed, but the target remains as the deepest bedrock with the steepest sidewall).

Line 05 at 130 m. This shows an uncharacteristic low resistivity spike as well as a deeper bedrock than up or down valley lines.

Line 11 from 130 – 155 m. This is the deepest bedrock dip in this feature and could yield interesting results due to anomalous occurrence.

14 Conclusion

The 2D Resistivity survey was conducted to explore Livingstone Creek for bedrock depth, paleochannel delineation, and structural IP anomalies. To this end, the survey has provided target locations for paleochannel exploration, fault line delineation as well as IP active areas within or around these faults. Test locations are provided to aid in exploration. Livingstone Creek appears to have a clay rich sediment regime and therefore low resistivity anomalies are the main target for exploration. Changes in sediment regimes from high to low resistivity can be beneficial for gold deposition as this often signifies a river bottom that is clay rich, which when saturated, becomes a strong bonding component for gold in suspension.

Qualifications

Boreal GeoSciences is an independent geophysics company founded in 2007. We are committed to providing a service that is consistent, professional and of the highest quality at a competitive price.

Our teams experience lies in the fields of geophysics, geology, chemistry, and software engineering. This combination along with 10 + years working in the field gives us a comprehensive and integrated approach to data interpretation. This has allowed us to provide clients with results that have proven to be exceptionally accurate and our demonstrated success over the years has earned us a reputation as leaders in placer related resistivity testing.

Our list of clients includes small family operated placer mines, large mining and exploration companies, engineering firms and government. Our projects range in size and scope and we are proud of our ability to accommodate individual clients needs with innovative approaches and solutions. We provide our clients with more than lines on a map, rather we provide the client with a thorough understanding of how the geological features shown will impact their operations.

We use the latest editions of application and processing software, as well as state-of-the-art geophysical and survey instrumentation which we have refined and customized to facilitate high mobility and rapid data acquisition in challenging northern terrains. Our custom lightweight equipment allows us to work in remote locations with minimal equipment and leaves the area as pristine as it was found.

A list of publications/clients as well as references are available upon request.

Confirmation

I have interpreted the data and prepared this report titled 2D Resistivity Survey for Placer Exploration, Livingstone Creek, Yukon. The surveys were carried out by Boreal GeoSciences of Whitehorse, Yukon Territory.

David Storm

Costs

BOREAL GeoSciences

INVOICE

P.O. Box 31402 RPO Main
Whitehorse, Yukon, Y1A 6K8
info@borealgeosciences.ca

INVOICE NO.	20YT-G(09)-113
DATE	October 5, 2020

TO **Golden Ram Inc**
33119 Ogilvie Street
Whitehorse, Yukon, Y1A 5Y5
Attn: Max Fuerstner / Gail Foote

Column1	Location	PAYMENT TERMS	Column2
2D Resistivity	Livingstone Creek 2020	Payment is Due upon Receipt	

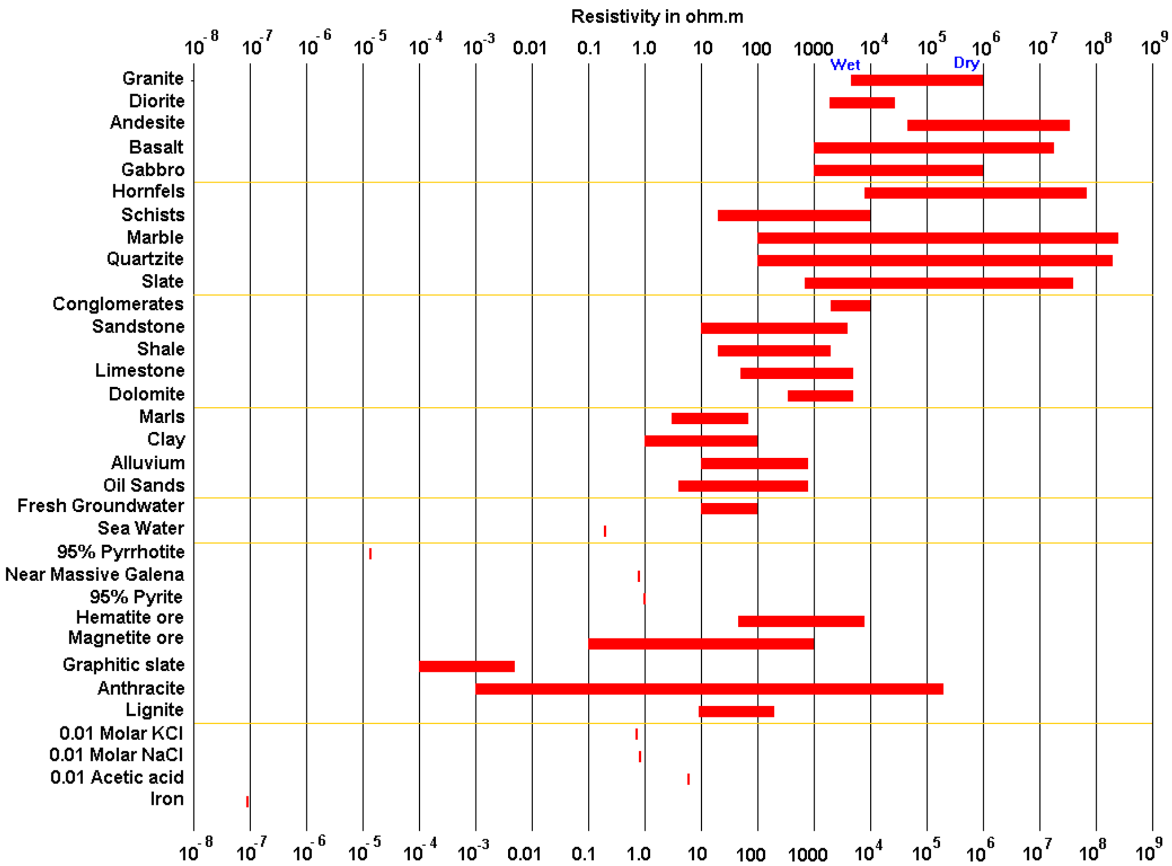
Amt	Description	Unit Price	TOTAL
	Mob/Demob		
0.50	Trip Prep & Load, depart from airport	$ 1,000.00	$ 500.00
1.00	Ford F350 Diesel Pickup @ 135.00/day	$ 135.00	$ 135.00
	Sub Total Mob/Demob		$ 635.00
	Geophysical Survey		
6.00	2D Resistivity Survey - Equipment, Operator & Field Tech	$ 2,100.00	$ 12,600.00
6.00	Satellite Phone	$ 55.00	$ 330.00
6.00	Generator	$ 10.00	$ 60.00
6.50	Camp rate - 2 persons on site	$ 175.00	$ 1,137.50
2.75	Interpretation & Prep Formal Report @ 75% of Daily Rate	$ 1,575.00	$ 4,331.25
	Sub Total Geophysics Survey		$ 18,458.75
		SUBTOTAL	$ 19,093.75
		G.S.T. (5%)	$ 954.69
		TOTAL	$ 20,048.44

THANK YOU FOR YOUR BUSINESS! GST #74597 7710 RT0001

Works Cited

Loke, M. (2015). Tutorial : 2-D and 3-D electrical imaging surveys. Geotomo Software.

Resistivity of Common Earth Materials4



4 (Loke, 2015)