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Arctic Geophysics Inc.

Geophysical Surveys • Prospecting • Consulting

2D Resistivity/IP Survey at Josephine Creek, Yukon 2014

UTM Zone 8 NAD83

401680 7087913

Prospecting Lease ID01080

Map 115/P15

FOR

GOLDSPIKE EXPLORATION INC.
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FROM

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WORK PERFORMED

7th - 12th Sept 2014

DATE OF REPORT

Table of Contents

1. Introduction

This geophysical investigation, using 2D Resistivity /IP, was done at Josephine Creek (Lease ID01080) for GOLDSPIKE EXPLORATION INC..

The 2D Resistivity profiles were conducted to prospect the ground for placer mining interests: The geophysical prospecting program was focussed on measuring and interpreting the following placer-related subsurface characteristics:

1. Depth and topography of bedrock
   Paleochannels, terraces
2. Sedimentary stratification
3. Groundwater, permafrost
4. Mining/prospecting history

The IP data were simultaneously taken with the Resistivity data and help to distinguish the local bedrock. This information supports the mineral prospecting done by GOLDSPIKE EXPLORATION INC. at Josephine valley.

The ground was tested with five measuring lines with a length of 200-360m and a depth of 35-60m. The fieldwork was done from August 7th - 12th Sept 2014.

2. Crew

Survey Leader: Stefan Ostermaier
Documentation: Philipp Moll

3. Claims

Grant Number	Tenure	#	Owner
ID001080	Prospecting Lease	-	Bruce Durham

4. Josephine Creek

Josephine Creek has a length of over 8.5 km and is a left tributary of Big Creek.

5. Access

The mining area was reached via the Clear Creek Road starting approx. 100km from Dawson. The distance from the beginning of Clear Creek Road to Josephine Creek is 75km.

6. Mining History

"Twenty-nine ounces of gold were reported to have been recovered in 1980 and 1981."[1]

"Much staking took place on Josephine in late summer and fall of 1901. Most of these claims soon lapsed. During the spring of 1904 Michael Spisak [one of the original stakers on this creek] returned to stake claims. These claims also soon lapsed. During 1973 D. Genier did testing on lower Josephine. Between 1979 and 1982 Arch Creek Mining Ltd. did testing and mining approximately 3 kilometres from the mouth. During 1981 and 1982 Cantung Mining Corp. Ltd. did test work in the same area. Reported production for 1981 was 12 ounces."[2]

Observations in the field during the survey: From the mouth of Josephine Creek to the first eastern tributary the valley bottom was stripped. This stripped area is now overgrown with shrubby vegetation (willow, dwarf birch). So the stripping seems to be have been done in the 1980's. Around Resistivity/IP Line_03 the ground was not stripped and several test holes of about 3x2m were dug. From Line_03 up to 250m downstream of Line_05 the ground looks quite virgin: the area is not stripped and just a few test holes were observed. Upstream of the spot 250m downstream from Line_05 the ground shows extensive mining activity almost up to the sources of Josephine Creek. Line_05 was done right across a 50m wide old pit.

Astonishingly no washed material was observed in the field all along Josephine valley! Along the Creek plenty of signs for shallow diggings were seen. But the volume of tested material seems to have been very small. The remains of the historic workings in 1981/82 allows for the theory of an unfinished test program: lots of material seems to have been moved - but not washed. A plausible explanation for that would be a lack of funds to go into production or more likely an investor pulled the plug on the project after only a small amount of gold was recovered during the test phase. - This is the theory of Stefan Ostermaier, survey leader of this geophysical survey.

7. Geophysical Methods

Resistivity is not a time domain geophysical method such as Ground Penetrating Radar or Seismic. Resistivity measures a material property. In the Resistivity model the different underground zones are material-dependently differentiated according to their electrical conductivity. Thus, Resistivity promises good chances in respect of measuring the kind and character of the subsurface materials as well as the groundwater distribution, which would be of interest for placer mining. The equipment used (see below) allows for measuring of layer interfaces in depths from 1m to 60m by varying the electrode spacing. – Therefore, this prospecting concept is based on the use of 2D Resistivity.

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[1] Yukon Placer Database

[2] Ditto

Figure 1: 2D Resistivity/IP measurement, Stefan Ostermaier, Arctic Geophysics Inc., Atlin, BC 2013

Induced Polarization (IP): IP data are simultaneously taken when measuring Resistivity, with the same equipment and line staking. So these data are automatically at hand when using Resistivity. The IP model serves as basis for the interpretation of the mineral and petrologic conditions in hardrock. Thus, IP is an industry proven standard method for the detection of primary mineral deposits. However, the IP model can support the interpretation of the Resistivity profiles done for placer prospecting.

8. Use of Geophysical Methods

8.1. Instrumentation

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

- “4 POINT LIGHT” EARTH RESISTIVITY METER[3]
- 80 ELECTRODE CONTROL MODULES[4]
- 80 STAINLESS STEEL ELECTRODES[5]

[3] Constructed and produced by LGM (Germany)
[4] Ditto
[5] Constructed and produced by GEOANALYSIS.DE (Germany)

- 480m MULTICORE CABLE: CONNECTOR SPACING: 5m[6]

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.

8.2. Data Acquisition

Resistivity

The data acquisition is carried out by the automatic activation of 4-point-electrodes. Thus 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 geoelectrical survey the **Schlumberger-array** was used. This array is appropriate to image horizontally running layers as is needed for placer prospecting.

The 2D Resistivity imaging system allows measurements with a depth of up to 70m. With a depth to bedrock of more than 6m, an electrode spacing of 5m can be used for placer surveys. This allows the measuring of large profile lengths in short time with a horizontal measuring resolution of 2.5m. This quantification has proven itself to be reliable in the determination of the bedrock topography and sedimentary arrangement for placer investigation at the most environmental conditions.

IP

The data acquisition mode was not optimised for IP (mineral exploration) but for Resistivity because this survey is basically focused on placer prospecting. However, the following criteria were considered when doing data acquisition to get IP data with good quality anyway: 1_low transition resistivity between electrodes and ground; 2_higher numbers of single measurements to calculate the average of each datum point (4point measurement).

8.3. Processing

Resistivity/IP

The measured Resistivity/IP data were processed with the **RES2DINV** inversion program[7].

8.4. Interpretation

The resistivity profile is the basic source for the interpretation of placer-related subsurface aspects of overburden and bedrock. The IP model supports the interpretation of the resistivity profile and provides insights to the bedrock.

The interpretation of the data should be verified by physical prospecting methods such as drilling, test pits, or shafting since the geophysical information about the subsurface cannot be guaranteed.

---

[6] Ditto

[7] Produced by GEOTOMO SOFTWARE (Malaysia)

9. Profile image

In the **Resistivity profile** the interpreted layer interfaces are marked with a black line. The profiles show ground-layers approximately 15% thicker than they are in reality. The thickening of the model layers is caused by the inversion software. The **correction factor** of 0.85 for the determination of the true layer thickness has been established by the Arctic Geophysics Inc. team on the basis of numerous geoelectrical profiles verified by drilling, test pits, shafting and mining done by our customers.[8]

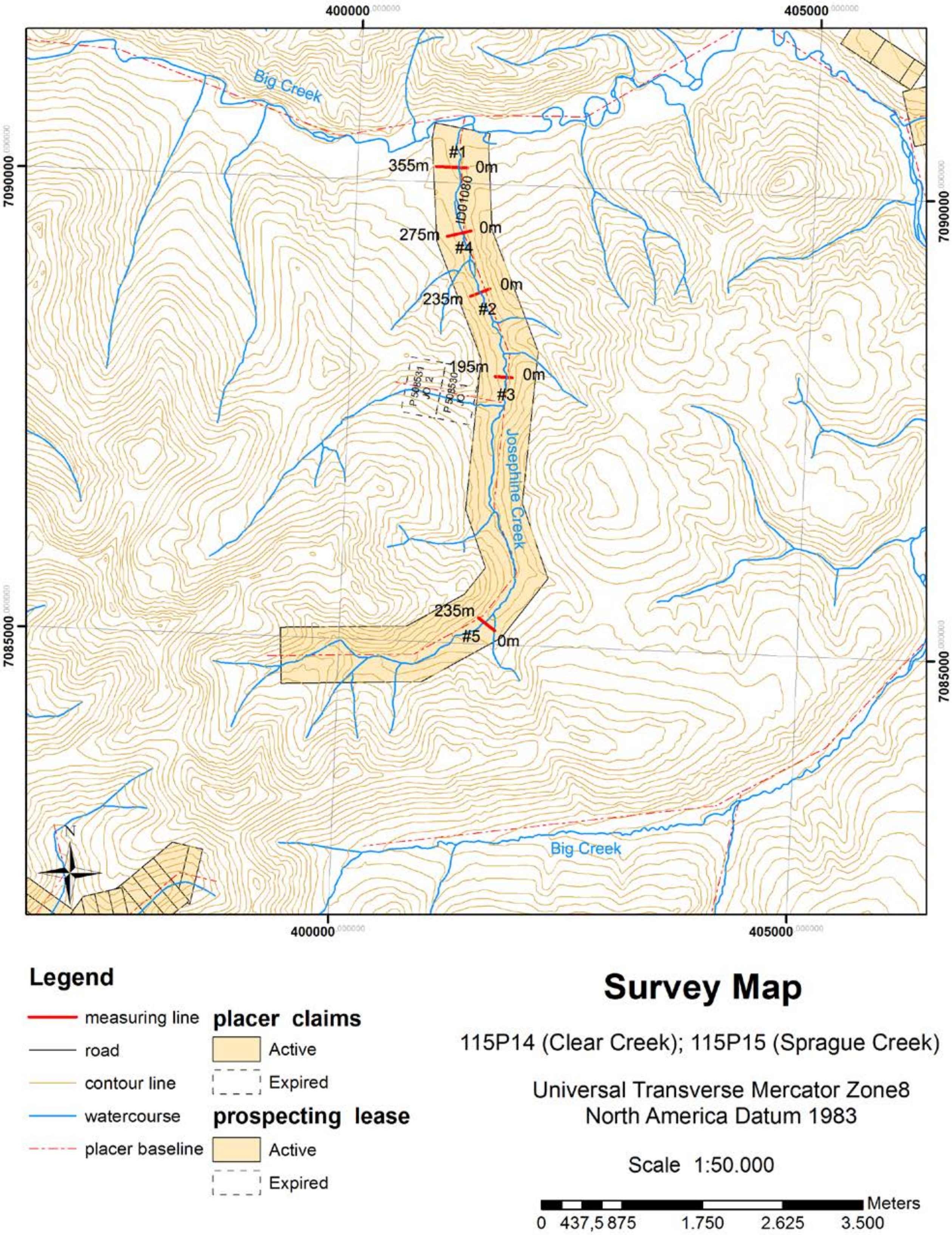
The **graphical markings** showing the interpreted layer interfaces in the profiles (using a black line) are done according to the data structure in the profile itself. This means: the layers there will also show up approximately 15% thicker than they are expected in reality. In the interpretation text, the layer thicknesses and depths have been recalculated to the expected real values.

10. Line Arrangement

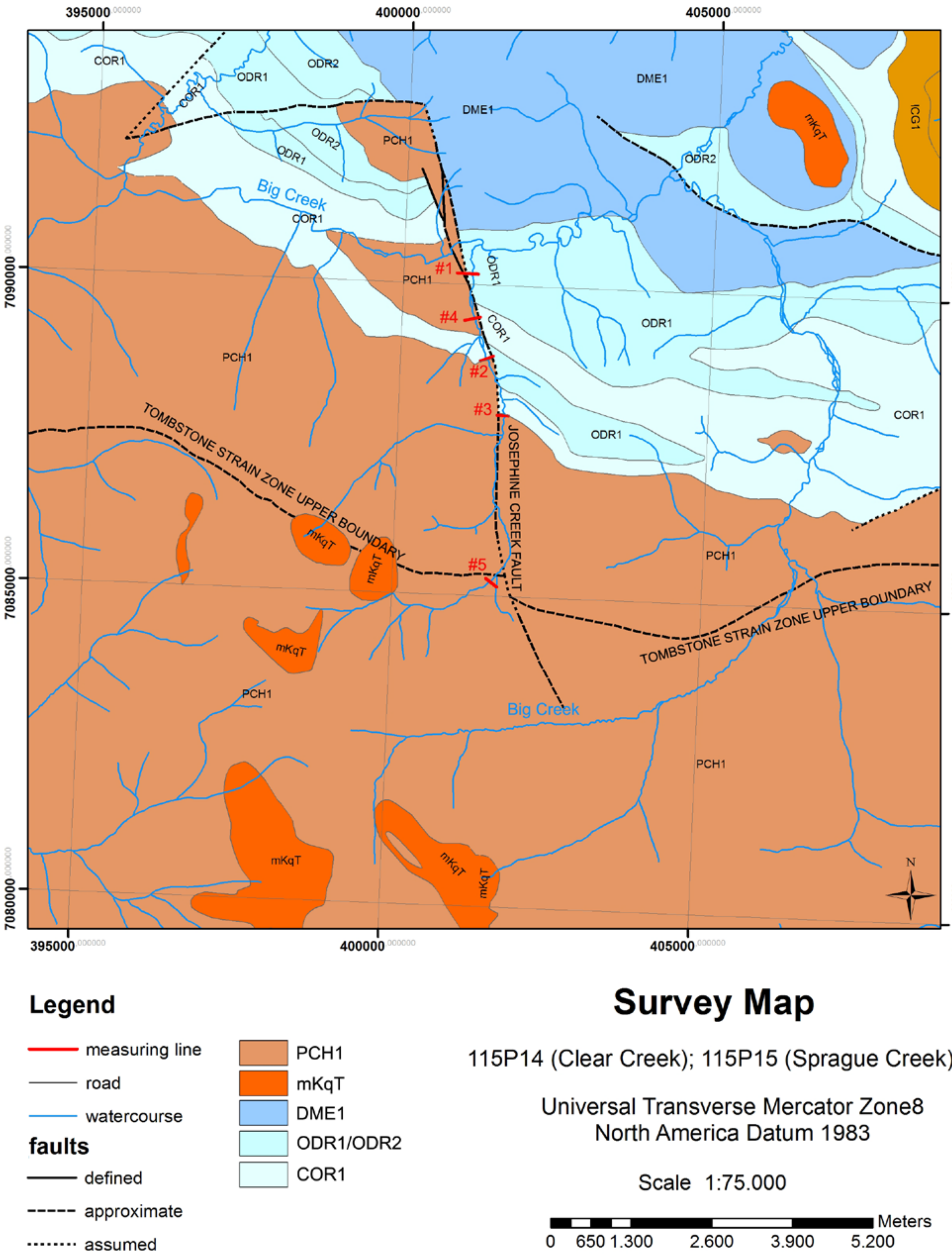
The **line locations** were discussed and decided upon by Stefan Ostermaier from Arctic Geophysics Inc. and Clayton Jones.

[8] The program settings in RES2DINV for modifying the layer thickness do frequently not work well for our use and could falsify the profile. That's why we work with a correction factor.

11. Survey Map



12. Bedrock Geology Map



Legend

PCH1: HYLAND: thin to thick bedded, brown to pale green shale, fine to coarse grained quartz-rich sandstone, grit, and quartz pebble conglomerate; minor argillaceous limestone; phyllite, quartzofeldspathic and micaceous psammite, gritty psammite and minor marble (Hyland Gp., Yusezyu)

mKqT: TOMBSTONE SUITE: medium- to coarse-grained, locally porphyritic biotite hornblende, clinopyroxene granite, quartz monzonite and granodiorite (Tombstone Suite)

DME1: EARN: thin bedded, laminated slate with thin to thickly interbedded fine to medium grained chert-quartz arenite and wacke; thick members of chert pebble conglomerate; black siliceous siltstone; nodular and bedded barite; rare limestone (Earn Gp., Portrait Lake and Prevost)

ODR1: ROAD RIVER - SELWYN: black, gun-blue, or silvery white weathering black graptolitic shale and black chert; resistant grey weathering, thin to medium bedded, light grey to black, greenish grey or turquoise chert; minor argillaceous limestone (Road River Gp., Duo Lake and Elmer Creek)

ODR2: ROAD RIVER - SELWYN: rusty dark green to orange buff weathering, pyritic, burrowed, thin to thick bedded, argillite and dolomitic siltstone with members or partings of black shale and chert; minor bright orange dolostone (Road River Gp., Steel)

COR1: RABBITKETTLE: thin bedded, wavy banded, silty limestone and grey lustrous calcareous phyllite; limestone intraclast breccia and conglomerate; massive to laminated, grey quartzose siltstone and chert and rare black slate; local mafic flows, breccia, and tuff (Rabbitkettle)

13. Geology

Josephine Creek is 8.5km in length showing a relatively high gradient. In most sections the valley bottom is just 50-70m wide and the slopes are steep. These topographical circumstances create high alluvial erosion resulting in shallow overburden, thickness of currently 5-10m. Near the mouth of the creek, prior to its confluence with Big Creek, the valley is widening and the gradient is significantly decreased. The "alluvial fan" in this section seems to show about 30m of overburden.

Josephine Creek might have been influenced moderately by the three glacial periods of the Mayo Range. But today no glacial characteristics are evident in the overburden anymore since younger alluvial processes might have removed potential glacial deposits.

"Bedrock is mapped as upper Proterozoic to lower Cambrian coarse turbidic clastics, limestones, thin to thick bedded, brown to pale green shale, fine to coarse grained sandstone, grit, and quartz-pebble conglomerate; minor argillaceous limestone; phyllite, quartzofeldspathic and micaceous psammite, gritty psammite and minor marble. (Hyland Group, Yusezyu), Road River Group Limestone, Rabbit Kettle Limestone."[9]

[9] Yukon Placer Database

"Surficial Geology: Deposits consist of .3 metres (1 foot) of black muck overlying 1.8 to 2.4 metres (6 to 8 feet) of gravel. The area has not been previously mined."[10]

"Stratigraphy: Depths to bedrock are from 2.1 to 2.7 metres and consist of 0.3 metres of muck overlying 1.8 to 2.4 metres of gravel. Gravel type and deposit conditions are probably similar to those on the nearby left fork of Clear Creek: depths increase near the head, permafrost only occurs in patches and gravels are generally coarse with occasional large boulders."[11]

14. Geophysical Implications

The different material components of the overburden (humus, muck, gravel) can hardly be differentiated in the Resistivity profiles, because they show quite similar resistivity data and are sometimes too thin to be measured. The reason for the similar resistivity of the overburden materials is the relatively high amount of fine material such as mud, silt and clay in-between the rock components such as gravels or clasts. The fine components (matrix) carry groundwater decreasing the resistivity. Just talus (colluvium) can usually be differentiated from river gravel, because it normally do have a poor matrix with water-saturated fine sediments.

Frequently, the limit of a permafrost zone (which normally produces a strong data contrast in the profile) is representing the transition between two different ground materials as well.

The interface between overburden and bedrock was clearly measured and realistically interpreted in the most parts of the resistivity images.

Horizontal data transitions in the interpreted bedrock might represent the fault line running along the valley (see Bedrock Geology Map above). The data contrast could indicate two different rock types or weathered bedrock besides solid bedrock.

[10] Yukon Placer Database
[11] Ditto

15. Profiles: Interpretation and Recommendation

Line 01_IP
2D Resistivity, Schlumberger array
72 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
Vertical exaggeration in model section display: IP 1.0
Data acquisition: Stefan Ostermaier, 3rd September 2014
Processing: Stefan Ostermaier, 3rd September 2014

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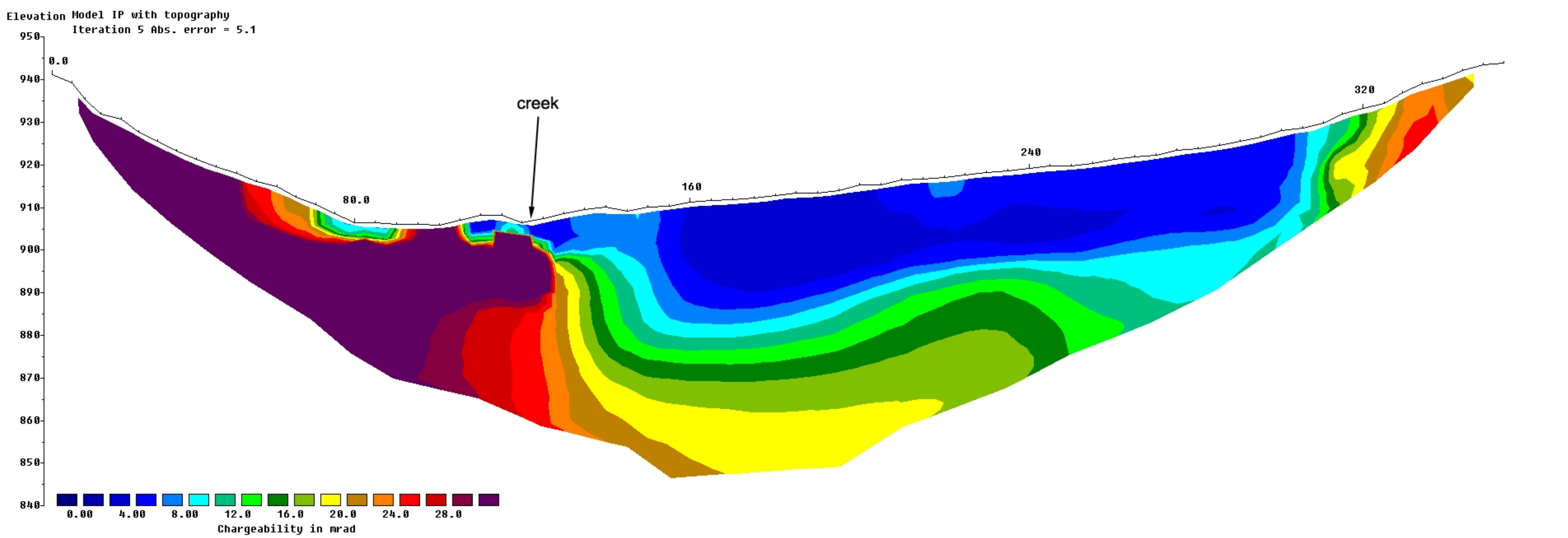
Interpretation



Line 01_Resistivity
2D Resistivity, Schlumberger array
72 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
Vertical exaggeration in model section display: RES 1.0
Data acquisition: Stefan Ostermaier, 3rd September 2014
Processing: Stefan Ostermaier, 3rd September 2014

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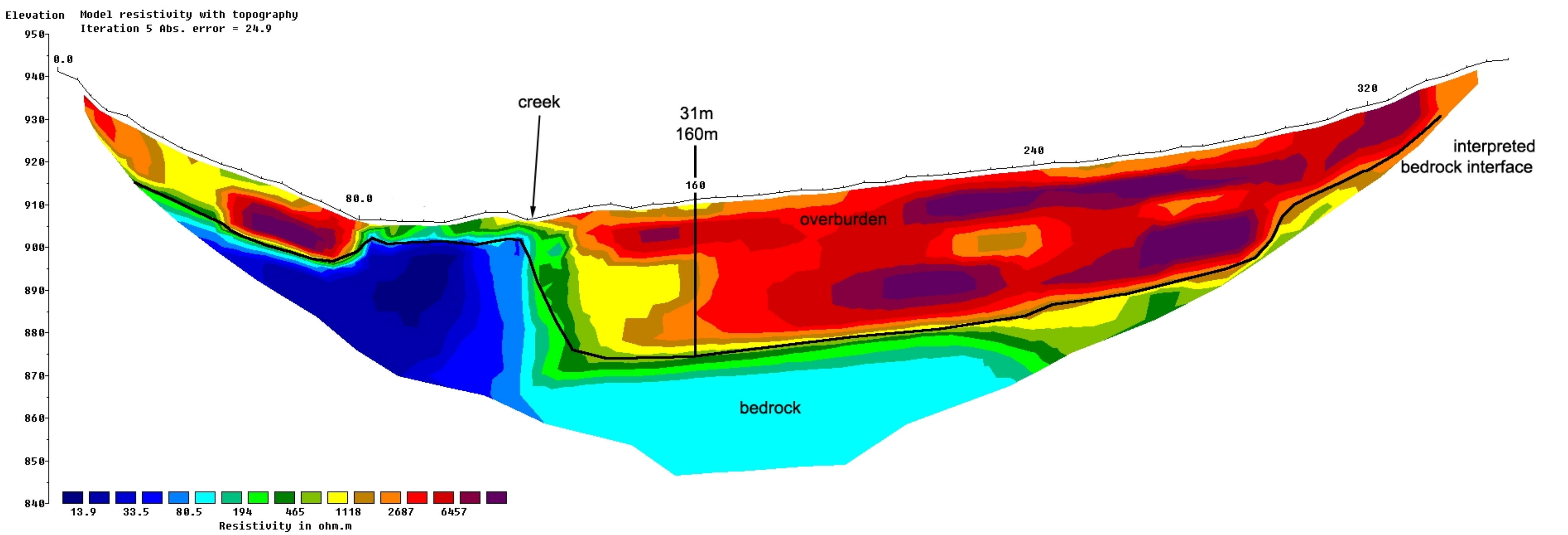
Interpretation



Interpretation

Resistivity profile_01 might show 5-31m of overburden on top of bedrock.

At 0-80m in the profile the interpreted overburden seems to be dominated by talus (colluvium). The high resistivity data could be explained by a lack of a matrix[12] consisting of finer sediments (such as silt and mud) holding groundwater.

At 80-120m just about 5 meter of overburden seem to lie on a hump-shaped bedrock. Alternatively and less likely in this section of the profile 30m of thawed overburden could have been deposited.

At 120-300m the overburden seems to be approx. 30m thick, frozen, dominated by river gravel with occasional boulders, with half a meter of muck/humus on top.[13] After 200m the Resistvity profile suggests three different layers in the overburden: The orange/red interlayer between the two violet layers might indicate three different gravel deposits of different age and shape. Alternatively the interlayer could contain moderate amounts of groundwater flowing between two frozen layers.[14]

After 300m the overburden seems to be frozen gravel.

Near the measuring line a bedrock outcrop was found: The bedrock was identified as shale with disseminated pyrite.[15] This rock type fits with the low resistivity data and is shown by the Bedrock Geology Map (Chapter 12.).

[12] Material between the gravel and clast particles

[13] Compare 12.Geology

[14] Groundwater flow through frozen gravel is a common phenomenon in the Yukon.

[15] Clayton Jones

The bedrock interface seems to be inclined by tectonic processes (see fault line on the Bedrock Geology Map.

IP model_01 indicates highly inducible bedrock being identified as shale disseminated with pyrite[16]. After 120m the bedrock shows moderate chargeability. - The horizontal data transition coincides with the bedrock change across the valley correlating with the fault seen on the Bedrock Geology Map.

Recommendation

It is recommended to drill at 160m. Representative gold samples are expected at this location even when using an auger drill since the overburden seems to be frozen.

[16] Clayton Jones

Line 02_IP
2D Resistivity, Schlumberger array
48 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
Vertical exaggeration in model section display: IP 1.0
Data acquisition: Stefan Ostermaier, 4th September 2014
Processing: Stefan Ostermaier, 4th September 2014

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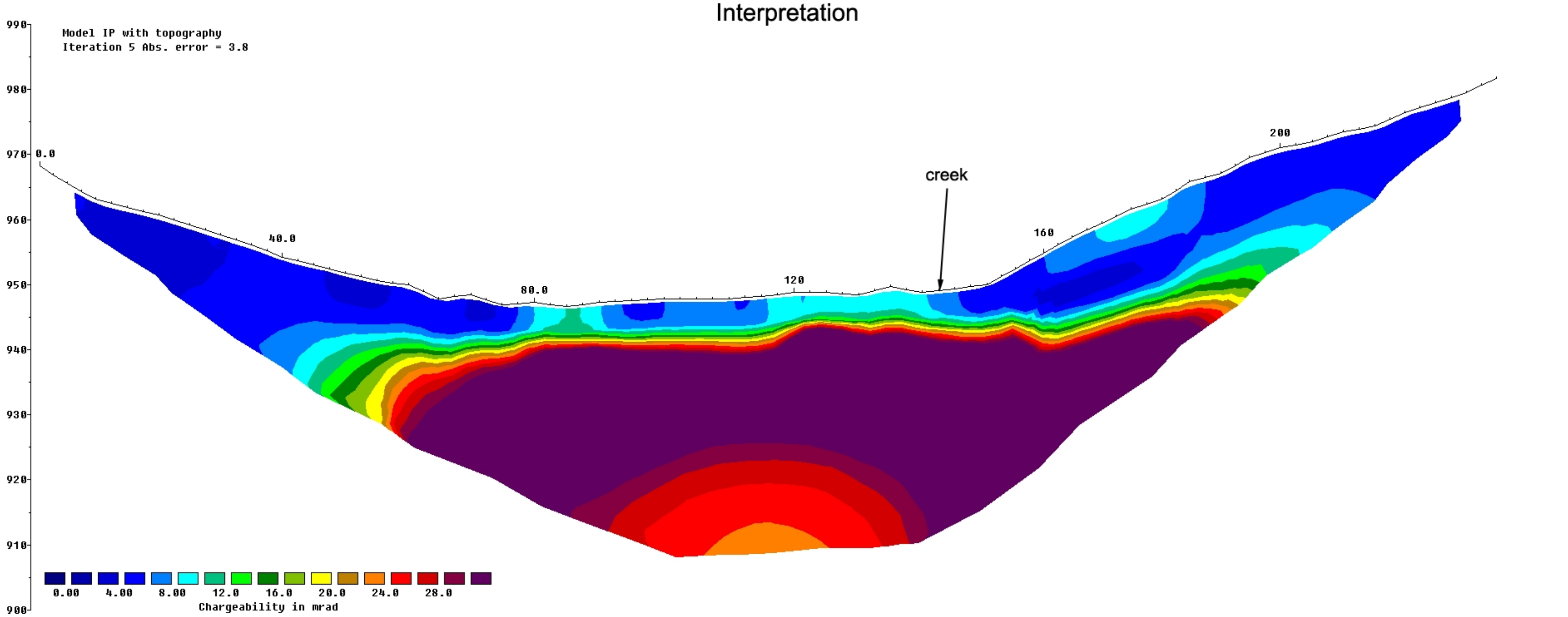
Interpretation



Line 02_Resistivity
2D Resistivity, Schlumberger array
48 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
Vertical exaggeration in model section display: RES 1.0
Data acquisition: Stefan Ostermaier, 4th September 2014
Processing: Stefan Ostermaier, 4th September 2014

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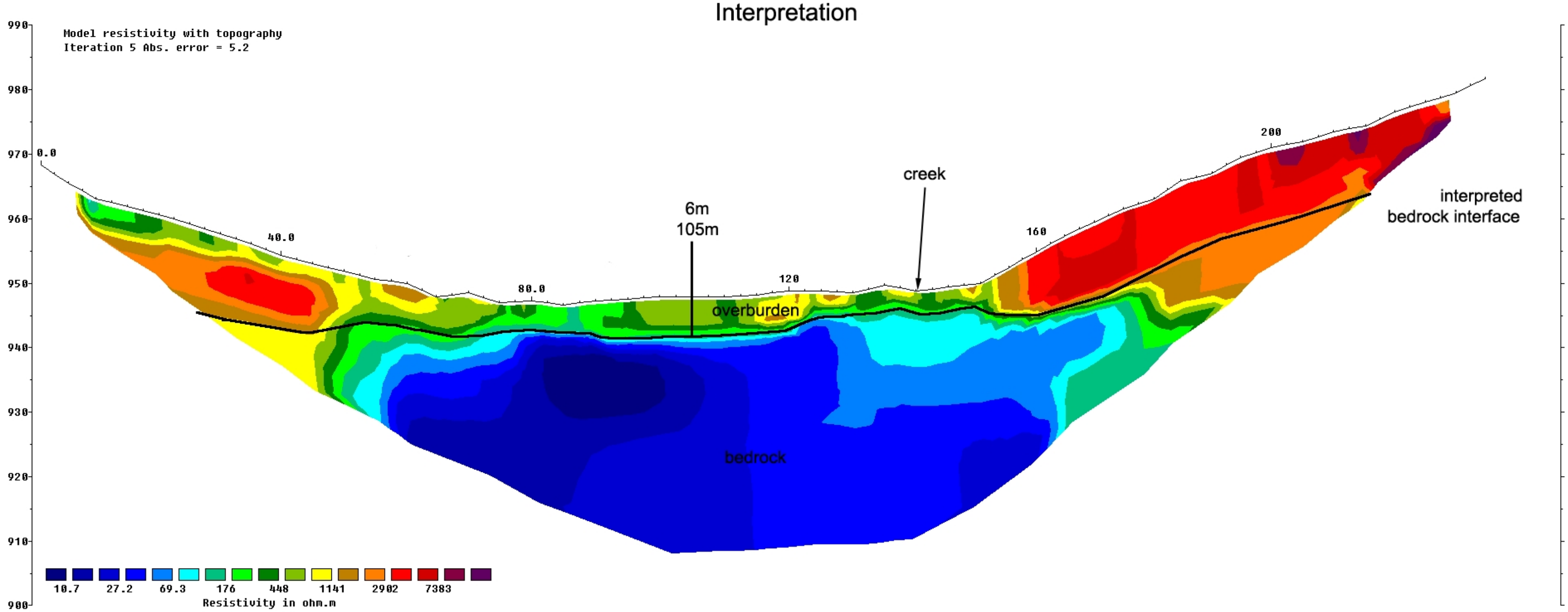
Interpretation



Interpretation

Resistivity profile_02 might suggest 4-10m of overburden on top of bedrock. In this section of the valley the overburden seems to be much shallower than at line location_01 downstream since the valley is much narrower resulting in greater alluvial erosion.

At 0-75m approx. 10m of talus are interpreted.

At 75-150m a thawed gravel layer, 4-6m thick, seems to lie on bedrock. Between 90 and 120m a paleochannel could be located.

After 150m frozen gravel seem to be deposited.

The bedrock shows continuously low resistivity which indicates shale.

The IP model_02 is clearly confirming the bedrock depth and topography suggested by the resistivity profile. The interpreted bedrock is highly IP active which could indicate disseminated pyrite in the bedrock or other sulfidic mineralization.

Recommendation

We recommend to dig a test hole at 106m where the bedrock is expected at 6m depth to verify the interpretation of a channel there.

Line 03_IP
2D Resistivity, Schlumberger array
40 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
Vertical exaggeration in model section display: IP 1.0
Data acquisition: Stefan Ostermaier, 5th September 2014
Processing: Stefan Ostermaier, 5th September 2014

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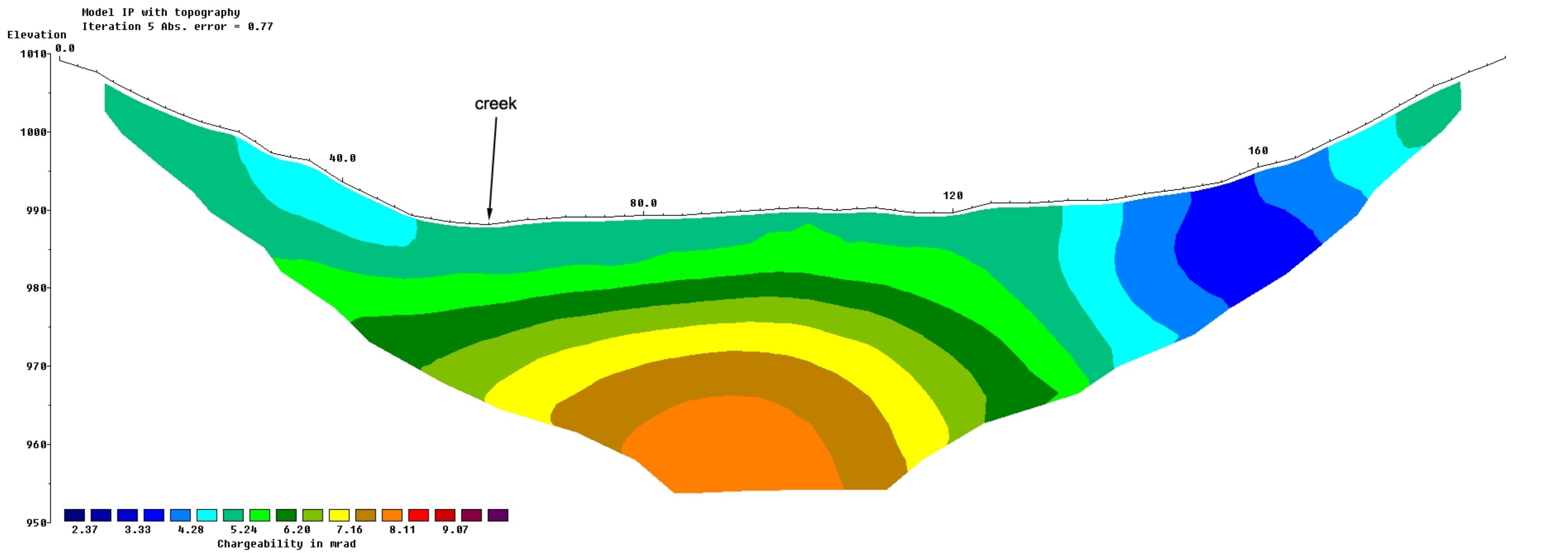

Line 03_Resistivity
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40 Electrodes: spacing 5m, Horizontal resolution 2.5m
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Vertical exaggeration in model section display: RES 1.0
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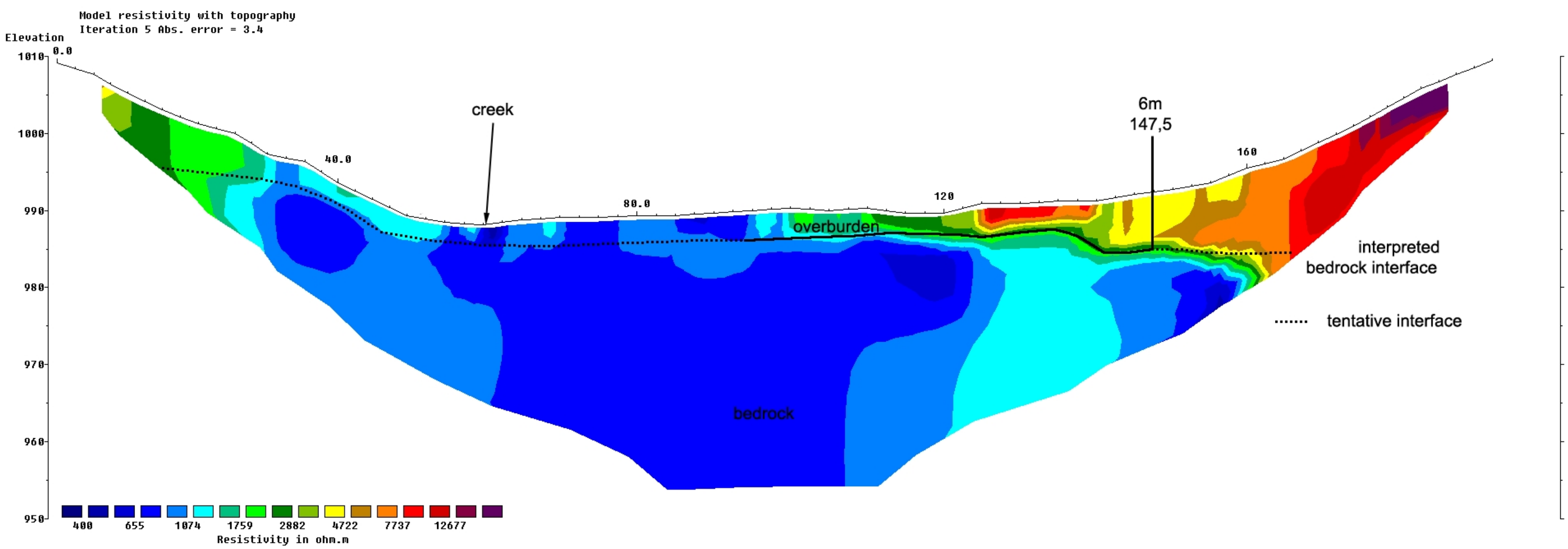

Interpretation

Resistivity profile_03 might show 2-6m of overburden on top of bedrock.

At 0-50m talus seems to be located.

At 50-135m a thin gravel layer, 2-3m thick, which might get more and more frozen after 100m, was detected.

After 135m the bedrock seems to drop into a paleochannel being at least 10m wide and filled with frozen gavel.

On the right slope frozen gravel or (more unlikely) talus is assumed.

The IP model_03 shows low chargeability successively increasing to the depth. There the bedrock must contain higher concentrations of IP-active minerals.

Recommendation

A small test pit is recommended at 147.5m to investigate the interpreted bedrock depth and the possible existence of a paleochannel there.

Line 04_IP
2D Resistivity, Schlumberger array
56 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
Vertical exaggeration in model section display: IP 1.0
Data acquisition: Stefan Ostermaier, 6th September 2014
Processing: Stefan Ostermaier, 6th September 2014

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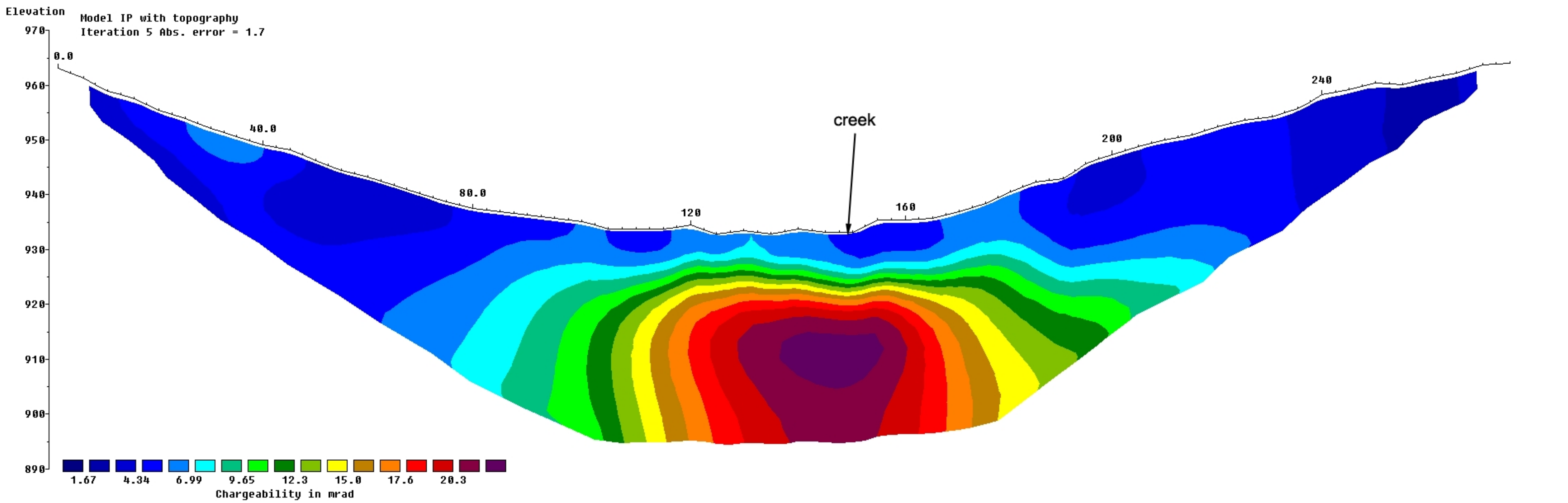

Line 04_Resistivity
2D Resistivity, Schlumberger array
56 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
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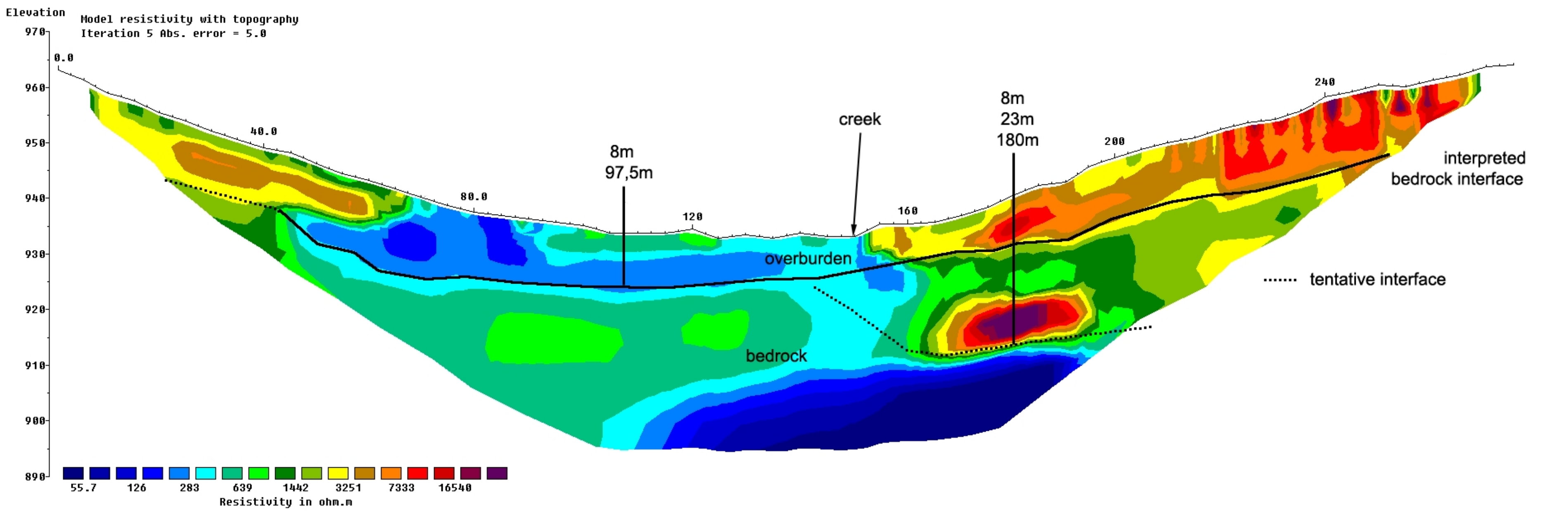

Interpretation

Resistivity profile_04 might show 5-10m of overburden on top of bedrock.

At 0-70m approx. 8m of talus seem to be deposited.

At 70-150m 5-8m of thawed gravel might sit on bedrock. At 97.5m the deepest point in the bedrock seems to be located.

After 150m the gravel gets frozen.

Alternatively and much less likely at 180m a bedrock depression 20m deep could exist. The overlying gravel of this vage channel would be frozen (red/violet data zone).

The bedrock produces contrasting resistivity data. The blue data matrix on the bottom could indicate shale sitting below other rock types showing discontinious weathering or metamorphism. The brightgreen data zones could indicate limestone, breccia or conglomerate. The red/violet zone could represent an igneous rock forming a sill (compare 11. Bedrock Geology Map).

The IP model_04 is showing a signal zone at 145m on the measuring line at 20m depth. This zone is relatively well conducting (low resistivity: turquoise). This data zone seems to have been created by localized mineralization correlating with the hypothetic sill. The rocks around the possibe sill are also showing lower resistivity data which would be also an indicator for possilbe mineralization surrounding a small sill.

Recommendation

It is recommended to drill or dig at 97.5m to verify the interpreted bedrock depth based on the resistivity profile. Groundwater could influence the sample when using an auger drill at this location.

It might be reasonable to drill at 180m to investigate the bedrock depth as well as the IP anomaly at 20m depth. At this location the bedrock is expected at 8m - or less likely at 23m.

Line 05_IP
2D Resistivity, Schlumberger array
48 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
Vertical exaggeration in model section display: IP 1.0
Data acquisition: Stefan Ostermaier, 7th September 2014
Processing: Stefan Ostermaier, 9th September 2014

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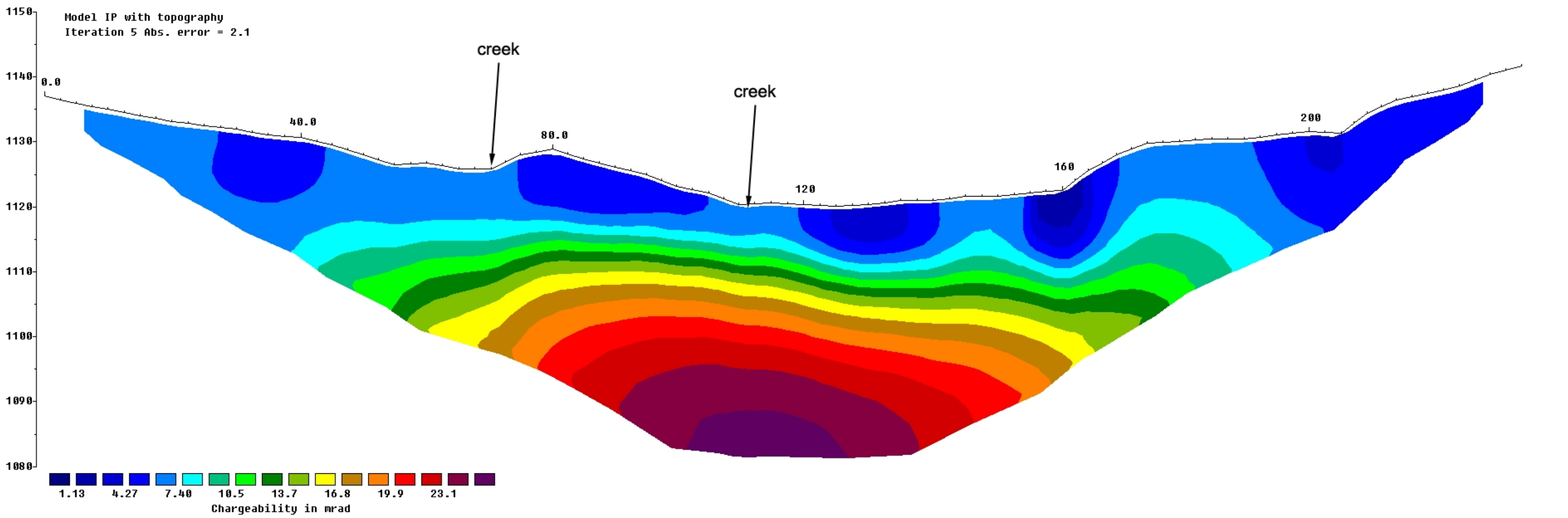

Line 05_Resistivity
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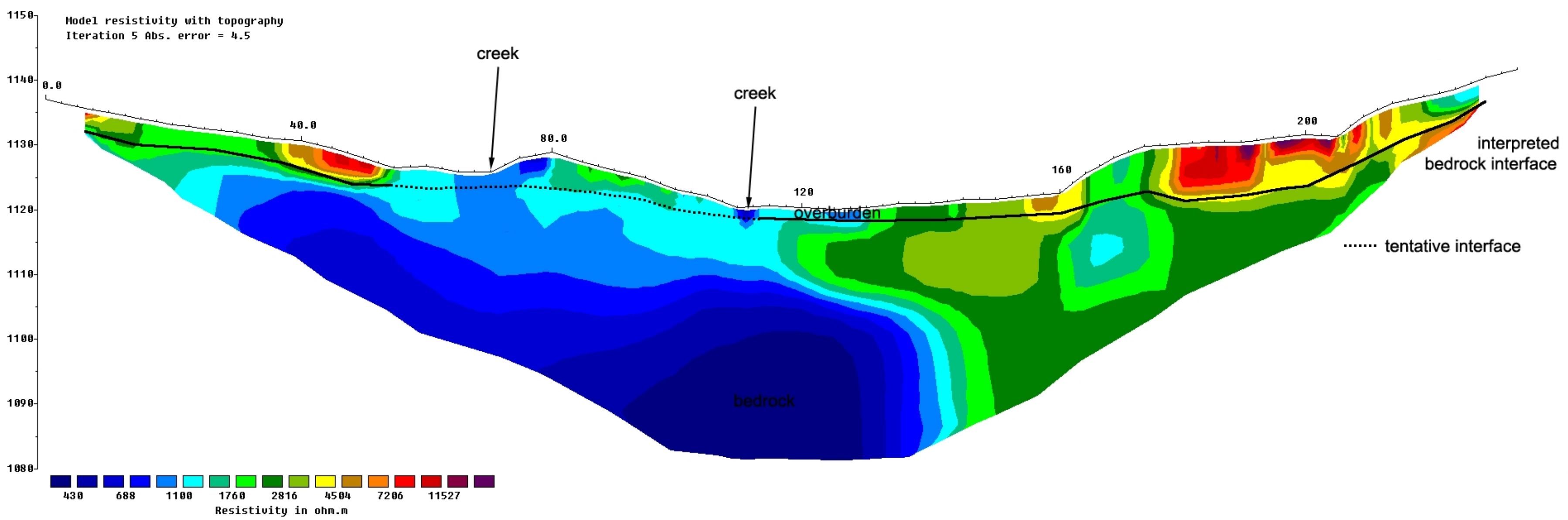

Interpretation

Resistivity profile_05 was run in an old mining pit, 60m wide, from 1981/82. This line was run to get insights of the former mining activity.

At 0-80m the ground looks virgin. A thin overburden layer dominated by gravel seems to be detected.

At 100-160m a mining pit filled with thin portion of technogenic gravel is located.

At 160m-210m a pile of unsorted technogenic gravel was observed.

After 210m the ground looks virgin.

The IP model_05 suggests a mineralisation in the bedrock starting at about 25m depth.

Recommendation

It is recommended not to invest in physical prospecting at this profile location because of the extensive and working activity in the past.

16. Qualifications

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Email: philipp.moll@arctic-geophysics.com

- Study of geology, University of Freiburg, Germany

- Visit of geophysical field courses, University of Karlsruhe and University of Stuttgart, Germany

- Working for Arctic Geophysics Inc. since June 2007 (foundation)

Geophysical field surveys using 2D Resistivity, Induced Polarization, Magnetics: Data acquisition, processing, interpretation, documentation

- Geophysical surveying for Mining Exploration in the Yukon since 2005

- Geological Prospecting for precious metals and minerals in the Yukon, NWTs, and Alaska since 1989

- Publications:

  A) Numerous Assessment Reports about geophysical surveys done for Yukon mining companies, filedat Yukon Mining Recorder

  B) Geophysical survey (45 field days) for Yukon Government: Yukon Geological Survey, Publication:
  http://www.geology.gov.yk.ca/recent.html Open Files: Moll, P., &Ostermaier, S., 2010. 2D Resistivity/IP Data Release for Placer Mining and shallow Quartz Mining - Yukon 2010.Yukon Geological Survey Miscellaneous Report MR-4.PDF Report [10.3 MB] &Data Profiles [45.4 MB]

Philipp Moll

17. Appendix
Literature

Location-specific
LeBarge William, Yukon Placer Database

W.P. LeBarge, J.D. Bond, and F.J. Hein
Bulletin 13: “Placer gold deposits of the Mayo area, central Yukon (2002)

Literature – Background
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Keller, G.V.and Frischknecht, F.C. Electrical methods in geophysical prospecting. Oxford: Pergamon Press Inc. (1966)

Loke M.H. and Barker R.D. Rapid least-squares inversion of apparent resistivity pseudosections by a quasi-Newton method. Geophysical Prospecting 44: 131-152 (1996)

Ostensoe Eric A. “Report on the Gladstone Creek, Placer Gold Property, Kluane Area” (Feb 1984), for: CATEAR RESOURCES LTD.

Press F., Siever R., Grotzinger J., Thomas H.J. Understanding Earth, W.H. Freeman and Company, New York (2004)

Robb L. Introducing to Ore-Forming Processes, Backwell Science Ltd., 2005

Maps

Energy, Mines and Resources: CSW_MINING.PLACER_LANDUSE_PERMIT_POLY_50K

Government of Canada, Natural Resources Canada, Centre for Topographic Information: 105OM13

Geophysical Data Table

Rock type	Resistivity range (Ωm)
Granite porphyry	4.5×10^3 (wet) – 1.3×10^6 (dry)
Feldspar porphyry	4×10^3 (wet)
Syenite	$10^2 - 10^6$
Diorite porphyry	1.9×10^3 (wet) – 2.8×10^4 (dry)
Porphyrite	$10 - 5 \times 10^4$ (wet) – 3.3×10^3 (dry)
Carbonatized porphyry	2.5×10^3 (wet) – 6×10^4 (dry)
Quartz diorite	$2 \times 10^4 - 2 \times 10^6$ (wet) -1.8×10^5 (dry)
Porphyry (various)	$60 - 10^4$
Dacite	2×10^4 (wet)
Andesite	4.5×10^4 (wet) – 1.7×10^2 (dry)
Diabase (various)	$20 - 5 \times 10^7$
Lavas	$10^2 - 5 \times 10^4$
Gabbro	$10^3 - 10^6$
Basalt	$10 - 1.3 \times 10^7$ (dry)
Olivine norite	$10^3 - 6 \times 10^4$ (wet)
Peridotite	3×10^3 (wet) – 6.5×10^3 (dry)
Hornfels	8×10^3 (wet) – 6×10^7 (dry)
Schists (calcareous and mica)	$20 - 10^4$
Tuffs	2×10^3 (wet) – 10^5 (dry)
Graphite schist	$10 - 10^2$
Slates (various)	$6 \times 10^2 - 4 \times 10^7$
Gneiss (various)	6.8×10^4 (wet) – 3×10^6 (dry)
Marble	$10^2 - 2.5 \times 10^8$ (dry)
Skarn	2.5×10^2 (wet) – 2.5×10^8 (dry)
Quartzites (various)	$10 - 2 \times 10^8$
Consolidated shales	$20 - 2 \times 10^3$
Argillites	$10 - 8 \times 10^2$
Conglomerates	$2 \times 10^3 - 10^4$
Sandstones	$1 - 6.4 \times 10^8$
Limestones	$50 - 10^7$
Dolomite	$3.5 \times 10^2 - 5 \times 10^3$
Unconsolidated wet clay	20
Marls	3 – 70
Clays	1 – 100
Oil sands	4 – 800

Costs

Arctic Geophysics Inc.

Geophysical Surveys • Prospecting • Consulting

DATE: September 27/2014
INVOICE # 20141120

BILL TO

GOLDSPIKE EXPLORATION INC.
4 King Street West, Suite 1500
Toronto, ON
M5H 1B6

JOB		PAYMENT TERMS
	Prospecting Lease ID01080 -Josephine Creek	Due upon receipt

QTY	DESCRIPTION	AMOUNT
	Mob/Demob	
7 days	Vehicle @ $ 70.00/day	$490.00
1028 km	Whitehorse to Josephine Creek, return @ .55/km	$565.40
1 day	Driving, move equip/build base camp, Operator & assistant, $ 650.00/day	$650.00
	Geophysical Survey	
5 days	Geoelectrical 2D Resistivity Imaging System:	
	96 electrodes, 6 Electrode Control Modules, 475m multi-core cable, PC,	
	GPS, altimeter, Survey Leader @ $ 880.00/day	$4,400.00
5 days	Field Assistant @ $ 250.00/day	$1,250.00
1.5 days	Survey Package: Data Processsing, Interpretation & Documentation @ $ 400.00/day	$600.00
1.5 days	Write Survey Report @ $ 400.00/day	$600.00
	SUBTOTAL	$8,555.40
	G.S.T. (5%) #846363216RT0001	$427.77
	TOTAL	$8,983.17

GPS-Data

2014 Line01

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
1	0.0	8 V 401196 7090168	3	*
2	5.0	8 V 401192 7090169	3	
3	10.0	8 V 401187 7090169	3	
4	15.0	8 V 401182 7090168	3	
5	20.0	8 V 401178 7090169	3	
6	25.0	8 V 401175 7090169	3	
7	30.0	8 V 401170 7090168	3	
8	35.0	8 V 401165 7090168	3	
9	40.0	8 V 401160 7090167	3	
10	45.0	8 V 401156 7090167	3	
11	50.0	8 V 401150 7090166	3	
12	55.0	8 V 401147 7090166	3	
13	60.0	8 V 401141 7090168	3	
14	65.0	8 V 401136 7090167	3	
15	70.0	8 V 401132 7090166	3	
16	75.0	8 V 401128 7090168	3	
17	80.0	8 V 401125 7090171	3	
18	85.0	8 V 401119 7090169	3	
19	90.0	8 V 401112 7090168	3	
20	95.0	8 V 401107 7090167	3	
21	100.0	8 V 401104 7090168	3	
22	105.0	8 V 401097 7090166	3	
23	110.0	8 V 401094 7090169	3	
24	115.0	8 V 401087 7090169	3	
25	120.0	8 V 401083 7090169	3	
26	125.0	8 V 401078 7090170	3	
27	130.0	8 V 401074 7090169	3	
28	135.0	8 V 401070 7090168	3	
29	140.0	8 V 401064 7090169	3	
30	145.0	8 V 401060 7090170	3	
31	150.0	8 V 401054 7090169	3	
32	155.0	8 V 401049 7090169	3	
33	160.0	8 V 401044 7090170	3	
34	165.0	8 V 401039 7090170	3	
35	170.0	8 V 401035 7090172	3	
36	175.0	8 V 401030 7090171	3	

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
37	180.0	8 V 401024 7090169	3	
38	185.0	8 V 401019 7090169	3	
39	190.0	8 V 401014 7090168	3	
40	195.0	8 V 401010 7090167	3	
41	200.0	8 V 401004 7090168	3	
42	205.0	8 V 401000 7090167	3	
43	210.0	8 V 400993 7090169	3	
44	215.0	8 V 400988 7090169	3	
45	220.0	8 V 400983 7090167	3	
46	225.0	8 V 400977 7090167	3	
47	230.0	8 V 400972 7090169	3	
48	235.0	8 V 400968 7090169	3	
49	240.0	8 V 400964 7090169	3	
50	245.0	8 V 400959 7090169	3	
51	250.0	8 V 400954 7090169	3	
52	255.0	8 V 400949 7090168	3	
53	260.0	8 V 400944 7090168	3	
54	265.0	8 V 400939 7090169	3	
55	270.0	8 V 400933 7090168	3	
56	275.0	8 V 400928 7090167	3	
57	280.0	8 V 400925 7090168	3	
58	285.0	8 V 400920 7090169	3	
59	290.0	8 V 400914 7090169	3	
60	295.0	8 V 400910 7090169	3	
61	300.0	8 V 400904 7090170	3	
62	305.0	8 V 400899 7090170	3	
63	310.0	8 V 400894 7090170	3	
64	315.0	8 V 400890 7090170	3	
65	320.0	8 V 400886 7090171	3	
66	325.0	8 V 400881 7090170	3	
67	330.0	8 V 400878 7090170	3	
68	335.0	8 V 400873 7090170	3	
69	340.0	8 V 400867 7090172	3	
70	345.0	8 V 400864 7090173	3	
71	350.0	8 V 400858 7090172	3	
72	355.0	8 V 400853 7090173	3	*

2014 Line02

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
1	0.0	8 V 401493 7088863	3	*
2	5.0	8 V 401489 7088862	3	
3	10.0	8 V 401484 7088859	3	
4	15.0	8 V 401479 7088858	3	
6	25.0	8 V 401471 7088855	3	
7	30.0	8 V 401467 7088853	3	
8	35.0	8 V 401463 7088851	3	
9	40.0	8 V 401459 7088848	3	
10	45.0	8 V 401454 7088848	3	
11	50.0	8 V 401450 7088845	3	
12	55.0	8 V 401445 7088843	3	
13	60.0	8 V 401441 7088842	3	
14	65.0	8 V 401436 7088840	3	
15	70.0	8 V 401432 7088837	3	
16	75.0	8 V 401428 7088836	3	
17	80.0	8 V 401423 7088831	3	
18	85.0	8 V 401418 7088831	3	
19	90.0	8 V 401413 7088828	3	
20	95.0	8 V 401407 7088827	3	
21	100.0	8 V 401403 7088825	3	
22	105.0	8 V 401399 7088823	3	
23	110.0	8 V 401394 7088820	3	
24	115.0	8 V 401390 7088818	3	
25	120.0	8 V 401387 7088817	3	
26	125.0	8 V 401382 7088815	3	
27	130.0	8 V 401377 7088813	3	
28	135.0	8 V 401372 7088811	3	
29	140.0	8 V 401368 7088807	3	
30	145.0	8 V 401364 7088807	3	
31	150.0	8 V 401361 7088806	3	
32	155.0	8 V 401355 7088804	3	
33	160.0	8 V 401350 7088803	3	
34	165.0	8 V 401345 7088799	3	
35	170.0	8 V 401343 7088797	3	
36	175.0	8 V 401338 7088797	3	
37	180.0	8 V 401334 7088795	3	
38	185.0	8 V 401329 7088794	3	
39	190.0	8 V 401325 7088794	3	

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
40	195.0	8 V 401322 7088792	3	
41	200.0	8 V 401317 7088790	3	
42	205.0	8 V 401312 7088789	3	
43	210.0	8 V 401307 7088787	3	
44	215.0	8 V 401303 7088785	3	
45	220.0	8 V 401300 7088783	3	
46	225.0	8 V 401295 7088781	3	
47	230.0	8 V 401290 7088780	3	
48	235.0	8 V 401286 7088778	3	*

2014 Line03

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
1	0.0	8 V 401773 7087909	3	*
2	5.0	8 V 401767 7087909	3	
3	10.0	8 V 401763 7087910	3	
4	15.0	8 V 401758 7087910	3	
5	20.0	8 V 401756 7087910	3	
6	25.0	8 V 401751 7087910	3	
7	30.0	8 V 401745 7087911	3	
8	35.0	8 V 401740 7087912	3	
9	40.0	8 V 401737 7087911	3	
10	45.0	8 V 401731 7087912	3	
11	50.0	8 V 401727 7087913	3	
12	55.0	8 V 401722 7087911	3	
13	60.0	8 V 401716 7087913	3	
14	65.0	8 V 401710 7087913	3	
15	70.0	8 V 401707 7087914	3	
16	75.0	8 V 401702 7087915	3	
17	80.0	8 V 401697 7087915	3	
18	85.0	8 V 401691 7087915	3	
19	90.0	8 V 401687 7087914	3	
20	95.0	8 V 401680 7087913	3	
21	100.0	8 V 401677 7087913	3	
22	105.0	8 V 401672 7087913	3	
23	110.0	8 V 401670 7087914	3	
24	115.0	8 V 401664 7087913	3	
25	120.0	8 V 401659 7087913	3	
26	125.0	8 V 401652 7087914	3	
27	130.0	8 V 401648 7087914	3	
28	135.0	8 V 401643 7087915	3	
29	140.0	8 V 401638 7087915	3	
30	145.0	8 V 401631 7087917	3	
31	150.0	8 V 401628 7087917	3	
32	155.0	8 V 401624 7087917	3	
33	160.0	8 V 401618 7087916	3	
34	165.0	8 V 401614 7087916	3	
35	170.0	8 V 401610 7087915	3	
36	175.0	8 V 401605 7087915	3	
37	180.0	8 V 401600 7087914	3	
38	185.0	8 V 401596 7087914	3	

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
39	190.0	8 V 401590 7087914	3	
40	195.0	8 V 401587 7087913	3	*

2014 Line04

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
1	0.0	8 V 401260 7089484	3	*
2	5.0	8 V 401257 7089483	3	
3	10.0	8 V 401252 7089482	3	
4	15.0	8 V 401248 7089481	3	
5	20.0	8 V 401243 7089480	3	
6	25.0	8 V 401238 7089479	3	
7	30.0	8 V 401235 7089477	3	
8	35.0	8 V 401231 7089475	3	
9	40.0	8 V 401227 7089472	3	
10	45.0	8 V 401221 7089471	3	
11	50.0	8 V 401216 7089469	3	
12	55.0	8 V 401213 7089469	3	
13	60.0	8 V 401208 7089468	3	
14	65.0	8 V 401203 7089466	3	
15	70.0	8 V 401197 7089464	3	
16	75.0	8 V 401193 7089463	3	
17	80.0	8 V 401190 7089460	3	
18	85.0	8 V 401187 7089461	3	
19	90.0	8 V 401182 7089459	3	
20	95.0	8 V 401177 7089458	3	
21	100.0	8 V 401169 7089456	3	
22	105.0	8 V 401164 7089455	3	
23	110.0	8 V 401162 7089453	3	
24	115.0	8 V 401155 7089450	3	
25	120.0	8 V 401150 7089450	3	
26	125.0	8 V 401146 7089449	3	
27	130.0	8 V 401142 7089448	3	
28	135.0	8 V 401135 7089446	3	
29	140.0	8 V 401130 7089445	3	
30	145.0	8 V 401127 7089444	3	
31	150.0	8 V 401121 7089443	3	
32	155.0	8 V 401116 7089441	3	
33	160.0	8 V 401113 7089442	3	
34	165.0	8 V 401107 7089442	3	
35	170.0	8 V 401102 7089440	3	
36	175.0	8 V 401097 7089438	3	
37	180.0	8 V 401095 7089440	3	
38	185.0	8 V 401090 7089437	3	

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
39	190.0	8 V 401084 7089435	3	
40	195.0	8 V 401080 7089433	3	
41	200.0	8 V 401076 7089432	3	
42	205.0	8 V 401072 7089430	3	
43	210.0	8 V 401066 7089429	3	
44	215.0	8 V 401061 7089429	3	
45	220.0	8 V 401056 7089427	3	
46	225.0	8 V 401051 7089426	3	
47	230.0	8 V 401048 7089425	3	
48	235.0	8 V 401043 7089424	3	
49	240.0	8 V 401039 7089422	3	
50	245.0	8 V 401035 7089423	3	
51	250.0	8 V 401030 7089421	3	
52	255.0	8 V 401025 7089421	3	
53	260.0	8 V 401018 7089419	3	
54	265.0	8 V 401015 7089420	3	
55	270.0	8 V 401010 7089419	3	
56	275.0	8 V 401005 7089418	3	*

2014 Line05

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
1	0.0	8 V 401692 7085152	3	*
2	5.0	8 V 401687 7085154	3	
3	10.0	8 V 401685 7085157	3	
4	15.0	8 V 401681 7085160	3	
5	20.0	8 V 401677 7085163	3	
6	25.0	8 V 401674 7085166	3	
7	30.0	8 V 401669 7085171	3	
8	35.0	8 V 401666 7085174	3	
9	40.0	8 V 401661 7085176	3	
10	45.0	8 V 401656 7085176	3	
11	50.0	8 V 401653 7085180	3	
12	55.0	8 V 401650 7085183	3	
13	60.0	8 V 401647 7085188	3	
14	65.0	8 V 401643 7085191	3	
15	70.0	8 V 401637 7085192	3	
16	75.0	8 V 401634 7085194	3	
17	80.0	8 V 401630 7085197	3	
18	85.0	8 V 401627 7085200	3	
19	90.0	8 V 401622 7085203	3	
20	95.0	8 V 401619 7085206	3	
21	100.0	8 V 401615 7085210	3	
22	105.0	8 V 401612 7085212	3	
23	110.0	8 V 401608 7085216	3	
24	115.0	8 V 401605 7085217	3	
25	120.0	8 V 401601 7085220	3	
26	125.0	8 V 401595 7085222	3	
27	130.0	8 V 401590 7085226	3	
28	135.0	8 V 401587 7085229	3	
29	140.0	8 V 401582 7085231	3	
30	145.0	8 V 401578 7085235	3	
31	150.0	8 V 401574 7085237	3	
32	155.0	8 V 401571 7085241	3	
33	160.0	8 V 401567 7085244	3	
34	165.0	8 V 401564 7085245	3	
35	170.0	8 V 401560 7085246	3	
36	175.0	8 V 401557 7085250	3	
37	180.0	8 V 401551 7085254	3	
38	185.0	8 V 401548 7085256	3	

Electrode No.	Location in Profile [m]	GPS-Coordinates UTM NAD 83	GPS-Accuracy [m]	Post [*]
39	190.0	8 V 401543 7085259	3	
40	195.0	8 V 401539 7085262	3	
41	200.0	8 V 401534 7085264	3	
42	205.0	8 V 401531 7085267	3	
43	210.0	8 V 401528 7085269	3	
44	215.0	8 V 401524 7085272	3	
45	220.0	8 V 401521 7085274	3	
46	225.0	8 V 401516 7085279	3	
47	230.0	8 V 401512 7085280	3	
48	235.0	8 V 401508 7085283	3	*