

**Report on 2020 Placer Exploration Program****Livingstone Creek, YMEP Grant #2020-043****Whitehorse Mining District, Yukon Territory****Prospecting Lease IW00733****and****Placer Claim Wade 2 P 513276****for****Star Mountain Resources****by****William LeBarge, P. Geo.****Geoplacer Exploration Ltd.****Location of centre of properties: 61°20'31"N, 134°18'15"W and 61°21'58"N, 134°22'48"W****NTS map sheet: 105E/08****Mining District: Whitehorse****Dates of work: September 17, 2020 to September 19, 2020****Date: January 19, 2021**

## Table of Contents

<b>Executive Summary .....</b>	<b>1</b>
<b>Introduction.....</b>	<b>2</b>
<b>Location and Access .....</b>	<b>2</b>
<b>Placer Tenure.....</b>	<b>4</b>
<b>History of Exploration and Mining.....</b>	<b>7</b>
<b>Bedrock Geology.....</b>	<b>8</b>
<b>Mineral Occurrences.....</b>	<b>8</b>
<b>Regional Surficial Geology and Glacial History.....</b>	<b>10</b>
<b>Placer Geology and Stratigraphy .....</b>	<b>12</b>
<b>September 2020 Placer Exploration Program .....</b>	<b>13</b>
<b>Resistivity Surveys.....</b>	<b>13</b>
<b>Overview.....</b>	<b>13</b>
<b>Personnel and Methodology .....</b>	<b>13</b>
<b>Limitations and Disclaimer .....</b>	<b>13</b>
<b>Results .....</b>	<b>14</b>
<b>Conclusions and Recommendations .....</b>	<b>19</b>
<b>Statement of Qualifications .....</b>	<b>20</b>
<b>William LeBarge .....</b>	<b>20</b>
<b>References.....</b>	<b>21</b>

## List of Figures

Figure 1 - Location of the Livingstone Creek Project, Yukon. ....	3
Figure 2 - Location of Livingstone Creek Placer Project (Livingstone District), 90 km northwest of Whitehorse. ....	5
Figure 3 – Livingstone Creek area placer prospecting leases, placer claims and active water licenses, November 8, 2020. ....	6
Figure 4 - Bedrock Geology of Livingstone District, modified after Colpron, (2017) and Yukon Geological Survey, (2018). ....	9
Figure 5 - Surficial geology and glacial features, Livingstone Creek area; after Klassen and Morison, (1987); and Bond and Church, (2006). ....	11
Figure 6 – Location of the resistivity survey RES20-LIV2M-01 conducted on an unnamed right limit Livingstone Creek tributary, on prospecting lease IW00733, in September 2020. ....	15
Figure 7 – Resistivity survey line RES20-LIV2M-01 was conducted about mid-way up the unnamed right limit tributary where prospecting lease IW00733 is located. Glacial till, boulder gravel and bedrock are interpreted in the profile with significant contacts at 6 m and 15 m below surface. ....	16
Figure 8 - Location of the resistivity survey RES20-SBS-01 conducted in the South Big Salmon river valley, on placer claim WADE 2, September 2020. Note that the actual location of claim WADE 2 is different than that shown on the Yukon Government map. ....	17
Figure 9 – Resistivity survey line RES20-SBS-01 was surveyed on the WADE 2 placer claim in the South Big Salmon river valley. Interpreted units in the profile include a surface layer of boulder-rich gravel overlying a less resistive layer which may be a glacial till and glacial silt. Two potential target areas are shown, with significant contacts at 8-10 m and 12-13 m below surface. Bedrock is somewhat undulating and interpreted at between 8 m and 14 m below surface. ....	18

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**List of Tables**

Table 1 –Claims and Prospecting Lease Status, Livingstone project. .... 4  
Table 2 - Mineral Occurrences (MINFILE) of the Livingstone Creek area, YGS 2018. .... 8  
Table 3 - Geographic coordinates and lengths of resistivity lines, Livingstone Creek area, September, 2020. .... 13  
Table 4 - Coordinates of targets from 2020 Resistivity surveys, Livingstone project. .... 14

**List of Plates**

Plate 1 - View of Prospecting Lease IW00733 at the mouth of unnamed Livingstone Creek right limit tributary, looking north. Photo taken October 8, 2015. .... 4

## Executive Summary

The following is a report on the 2020 placer exploration program on the Livingstone Creek area, under YMEP Grant #2020-043, for Star Mountain Resources, by Geoplacer Exploration Ltd. The Livingstone project area is in the south-central part of the Yukon and lies approximately 90 km by air northeast of Whitehorse and 50 km east of Lake Laberge.

Two resistivity surveys totalling 545 line-m were completed: 335 line-m on placer claim Wade 2; and 210 line-m on prospecting lease IW00733. Both are 100 % held by Benjamin Sternbergh, a principle in Star Mountain Resources.

On resistivity survey line RES20-LIV2M-01, glacial till, boulder gravel and bedrock are interpreted with significant contacts at 6 m and 15 m below surface. A possible south-dipping contact may be the subsurface expression of a fault shown on the bedrock map as approximately 1 km to the north of the survey line.

On resistivity survey line RES20-SBS-01 in the South Big Salmon river valley, interpreted units in the profile include a surface layer of boulder-rich gravel overlying a less resistive layer which may be a glacial till and glacial silt. Two potential target areas were chosen, with significant contacts at 8-10 m and 12-13 m below surface. Bedrock is somewhat undulating and interpreted at between 8 m and 14 m below surface.

In both surveyed areas, the target zones lie between 6 m and 10 m below surface, which is within reach of a medium to large excavator. Testing of the targets by a series of excavator pits along the lines is therefore recommended to these depths.

Additional cross-valley resistivity surveys are recommended in both areas, in order to better delineate the orientation, depth and extent of any potential buried gravel channels.

If possible, a drill should be brought in to confirm interpreted depths and sample the gold content of the deeper targets. Given the boulder-rich nature of the ground, the drill should either be a cased reverse circulation (R/C) drill (which has an inside diameter of 6 inches or greater) or a similarly-sized sonic drill.

The project area would also benefit from updated areal imagery from a UAV drone survey.

## **Introduction**

The following is a report on the 2020 placer exploration program on the Livingstone Creek area, under YMEP Grant #2020-043, for Star Mountain Resources Ltd., by Geoplacer Exploration Ltd.

## **Location and Access**

Livingstone Creek lies in the south-central part of the Yukon approximately 90 km by air northeast of Whitehorse and 50 km east of Lake Laberge (Figure 1, Figure 2).

The two areas worked in 2020 in the Livingstone area were located at 61°20'31"N, 134°18'15"W and 61°21'58"N, 134°22'48"W: on NTS map sheet 105E/08, in the Whitehorse Mining District (Figure 3).

Access to the properties from Whitehorse can be gained by fixed-wing, helicopter or winter road. The winter road crosses the Teslin River and is available usually only at the height of the winter season.

There are several intermittently maintained bush airstrips, and several all-terrain vehicle suitable trails traverse the field area. A 1700 metre airstrip is situated in the South Big Salmon river valley near Lake Creek. The geographic coordinates of that airstrip are 61°21'58"N and 134°22'19"W. Another, unknown quality airstrip approximately 1 km in length is located at the mouth of Martin Creek at geographic coordinates 61°18'14"N and 134°19'42"W. Finally, a 700-metre-long airstrip of unknown condition is located at the mouth of May Creek, at geographic coordinates 61°16'19"N and 134°10'16"W.

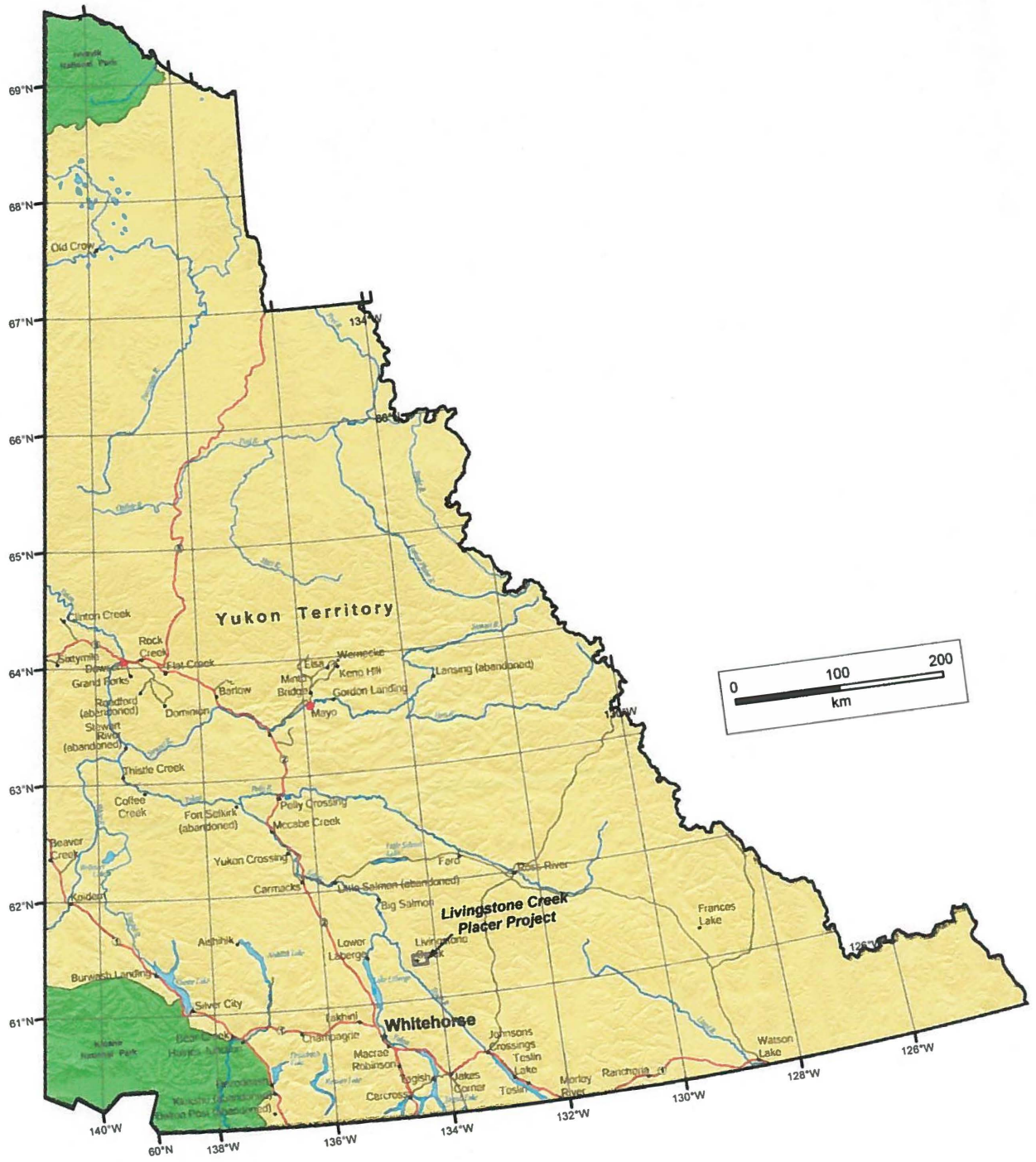


Figure 1 - Location of the Livingstone Creek Project, Yukon.

## Placer Tenure

Table 1 details the status of the Livingstone Creek area claims and prospecting leases.

**Table 1 –Claims and Prospecting Lease Status, Livingstone project.**

Grant Number	Status	Length/Name	Claim Owner	Staking Date	Recording Date	Expiry Date
<b>IW00733</b>	Active	2 miles	Benjamin Sternbergh - 100%	2020-03-21	2020-03-26	2022-05-06
<b>P 513276</b>	Active	WADE 2	Benjamin Sternbergh - 100%	2020-04-12	2020-04-20	2022-04-20
<b>P 513275</b>	Active	WADE 1	Star Mountain Resources - 100%	2020-04-12	2020-04-20	2022-04-20
<b>P 512938</b>	Active	WADE	Star Mountain Resources - 100%	2019-08-12	2019-08-21	2021-08-21



**Plate 1 - View of Prospecting Lease IW00733 at the mouth of unnamed Livingstone Creek right limit tributary, looking north. Photo taken October 8, 2015.**

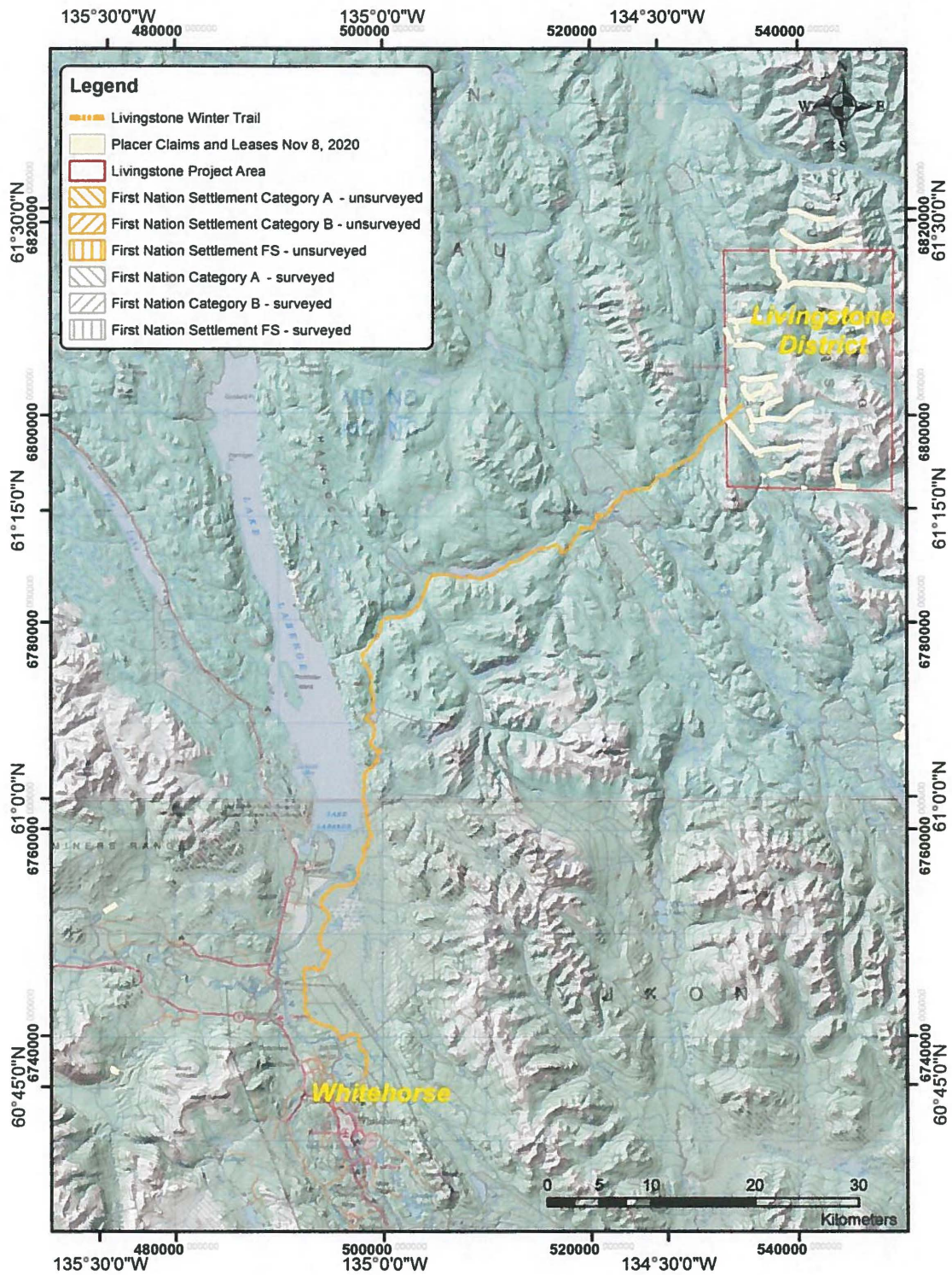


Figure 2 - Location of Livingstone Creek Placer Project (Livingstone District), 90 km northwest of Whitehorse.

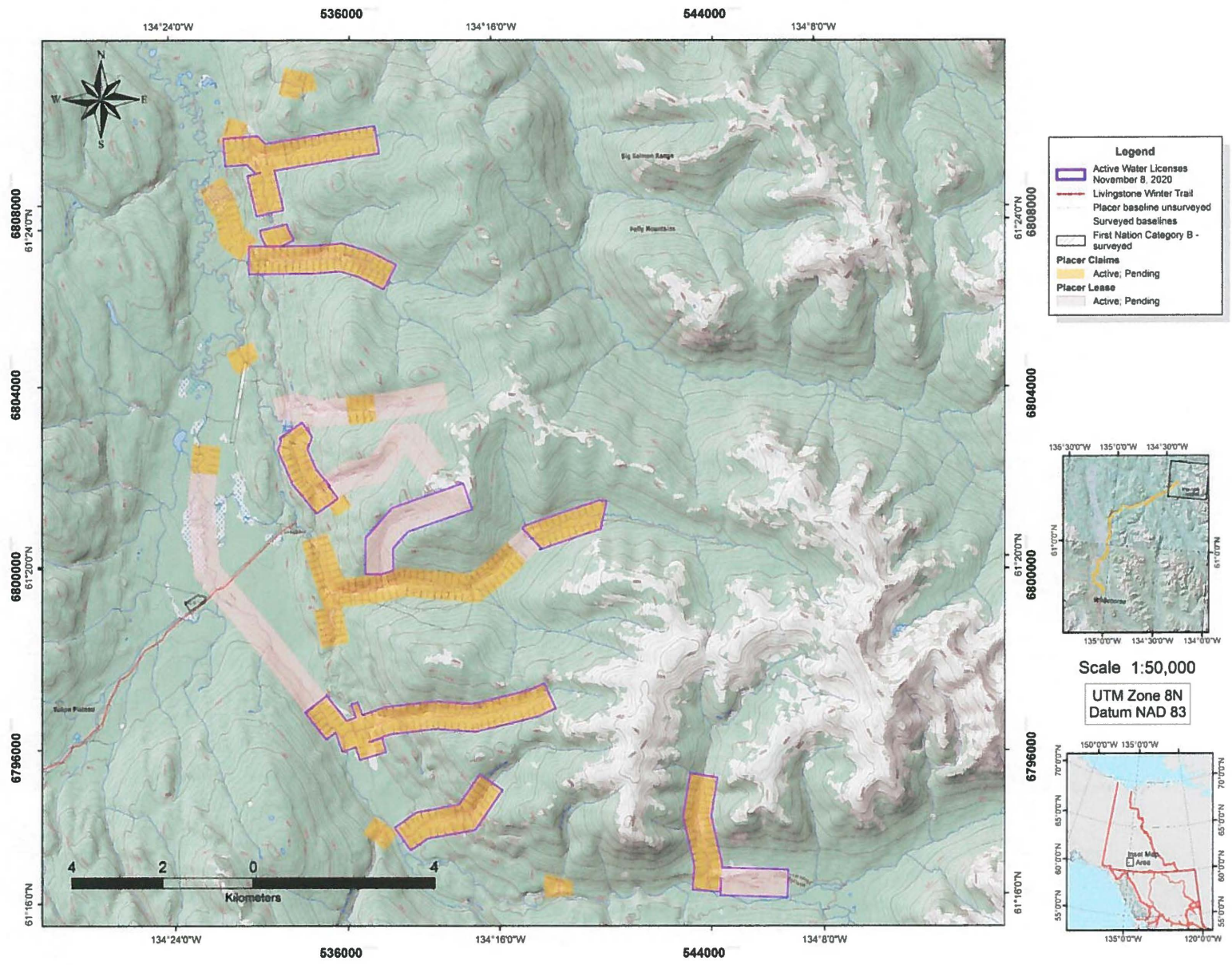


Figure 3 – Livingstone Creek area placer prospecting leases, placer claims and active water licenses, November 8, 2020.

## History of Exploration and Mining

Although Yukon Government royalty records show only about 18,000 ounces credited from Livingstone area creeks to 2019 (Yukon Mining Recorder, 2019), the actual production is known to be several times higher. One of the reasons is that since most of the gold from Livingstone creeks is coarse, the modern market is mainly local jewelers and collectors, who would not be intending to export the raw gold out of the Yukon. Since placer gold which is sold for use within the Yukon is not required to have royalties paid, it is often not recorded in any government ledgers.

The Livingstone Creek area was first prospected in 1894 by Joseph E. Peters (LeBarge, 2007). In 1898, Mr. Peters returned to the area with Mr. George Black and together they discovered gold on the Livingstone Creek itself, naming it after Black's friend M. Livingstone. That year, in the four weeks before freeze-up, they mined about 200 ounces. Bostock (1957) mentions that that production between 1898 and 1920 produced over \$1,000,000 in placer gold, which roughly calculates to 46,000 troy crude ounces using a gold price of \$19/ounce and a fineness of 880. Cairnes (1910) stated that the claims on the "old channel" on Livingstone Creek had produced, on the average, about \$25,000 (1157 troy crude ounces) each. The total production in 1906 was about \$90,000 (4168 troy crude ounces). Discovery Claim is stated to have yielded \$11,000 (509 troy crude ounces) in 1900.

Interest in the Livingstone area was revived by T. Kerruish's new discovery on Lake Creek in 1930; and during the 1930's there were 10 to 15 men on Livingstone Creek each year involved in mining a buried left limit channel and "sniping" on the worked over ground in the canyon (Bostock and Lees, 1938).

During the 1940's, J. Stenbraten held much ground on Livingstone Creek, but most of his work was preparatory in nature and little gold was produced (LeBarge, 2007).

During the late 1950s and early 1960s L. Engle and C. Emminger prospected on Discovery Claim. In 1961 G. Murdock and J. Ballentine prospected on the creek. In 1967 M. Fuerstner and E. Kreft staked a one mile lease. Max Fuerstner Jr. took over the mining from Max Sr. in the 1980's. Mining has been intermittent since then, with the most recent mining activity on Livingstone Creek taking place in the late 1990's. Seismic refraction was attempted on some placer leases upstream of the canyon in 1981, but was unsuccessful due to attenuation by permafrost (LeBarge, 2007).

## Bedrock Geology

The bedrock geology of the Livingstone Creek area is shown in Figure 4. East and north of the South Big Salmon River lie five successions of metasedimentary and metavolcanic rocks: the Snowcap complex, and the Livingstone Creek, Mendocina, Last Peak and Dycer Creek successions (Colpron, 2006, 2017). These occur in two structural domains separated by d'Abbadie fault. The Dycer Creek succession occurs east of the fault while all other successions occur west of the fault (Colpron, 2017).

Figure 4 shows that the area between the upper reaches of Livingstone Creek and the middle reaches of May Creek is dominated by metasedimentary rocks of the Snowcap complex; which are in turn intruded by strongly foliated and locally gneissic Early Mississippian tonalite to granodiorite. Along a north-south trend between the upper-most reaches of Livingstone Creek and the South Big Salmon River, lays metavolcanics, metasediments and marble of the Livingstone Creek succession; and serpentinized peridotite and greenstone of the Mendocina succession (Colpron, 2006; 2017).

Several bedrock mineral occurrences are noted in the area. These are given in Table 2, below.

## Mineral Occurrences

Several bedrock mineral occurrences are noted in the area. These are given in Table 2, below.

**Table 2 - Mineral Occurrences (MINFILE) of the Livingstone Creek area, YGS 2018.**

MINFILE NUMBER	NAME	DEPOSIT TYPE	STATUS	PRODUCER	COMMODITY
105E 001	LIVINGSTON	Vein Polymetallic Ag-Pb-Zn+/-Au	Showing	N	Copper, Silver, Lead, Gold
105E 020	SYLVIA	Vein Polymetallic Ag-Pb-Zn+/-Au	Showing	N	Copper, Gold, Zinc, Silver, Lead
105E 042	LAKE	Vein Au-Quartz	Showing	N	Gold
105E 043	GERM	Unknown	Anomaly	N	Gold
105E 047	MAYBE	Unknown	Anomaly	N	Gold, Lead
105E 053	DEET	Vein Polymetallic Ag-Pb-Zn+/-Au	Showing	N	Antimony, Gold, Arsenic, Lead, Silver, Zinc
105E 049	LITTLE VIOLET	Unknown	Unknown	N	
105E 063	NICKELINE	Ultramafic - Nickel	Showing	N	Antimony, Cobalt, Nickel, Arsenic
105E 054	TRERICE	Unknown	Unknown	N	
105E 056	BRENDA	Unknown	Unknown	N	



## Regional Surficial Geology and Glacial History

The Livingstone District lies well within the late Wisconsinan McConnell glaciation (Duk-Rodkin, 1999) and the most obvious glacial features are of that age. Older glaciations certainly would have blanketed the area, however all features of those earlier episodes have been overprinted by the most recent glacial advance.

Figure 5 shows the glacial features and surficial deposits in the Livingstone District, which were mapped by Hughes et al (1969) and Klassen and Morison (1987); and later updated by Bond and Church (2006).

Surficial deposits in the area are mainly till and colluvium, while an irregular glaciofluvial complex occurs in the South Big Salmon Valley near the mouth of Martin Creek (Klassen and Morison, 1987). The prominent valley that diverts the westerly flow of Livingstone and Summit Creeks is an ice-marginal channel (Hughes et al, 1969).

Indicators of former ice flow direction, mapped by Hughes et al (1969) and Klassen and Morison (1987) suggest that glaciers flowed north along the low valleys that cross the Semenof Hills into the South Big Salmon River Valley in the Livingstone Creek area.

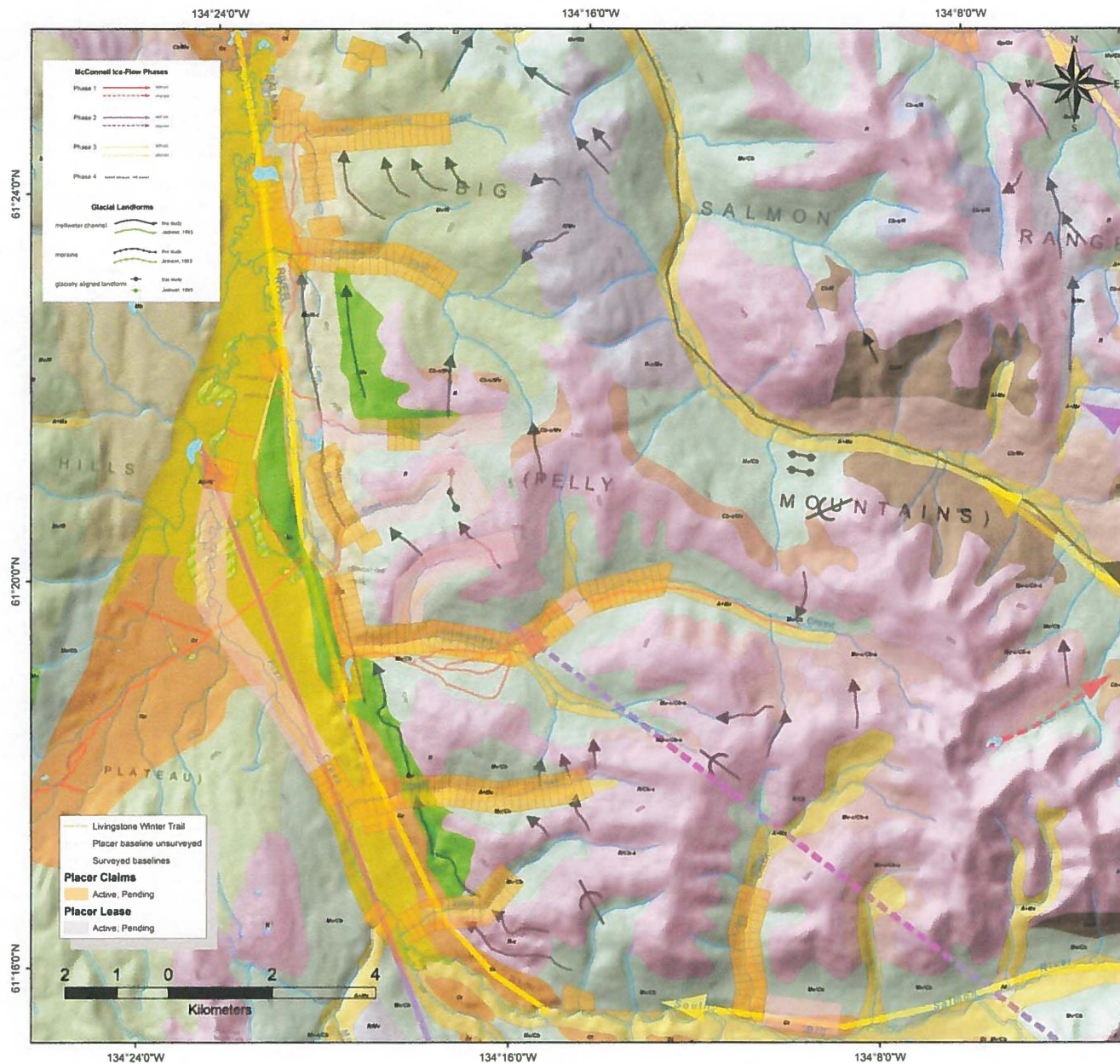
Bond and Church (2006) proposed a four-phase ice-flow history for the Big Salmon Range. This is briefly summarized as following:

Phase 1, a locally derived ice advance, marks the initial accumulation of ice at the onset of glaciation. Geological evidence of this phase is either eroded or buried by later glacial phases. General zones of ice accumulation are inferred from well-developed cirques.

Phase 2 occurred when Cordilleran ice advanced northwest and overtopped the Big Salmon Range at its glacial maximum. High-elevation ice-flow indicators suggest the Cassiar lobe of the Cordilleran ice sheet moved across the range virtually unobstructed by the underlying topography.

Phase 3 occurred when the Cassiar lobe retreated from the Big Salmon Range. With reduced ice thickness during glacial recession the Cassiar lobe became increasingly directed by underlying topography. East-flowing drainages in the Big Salmon Range experienced up-valley ice-flow as the Cassiar lobe maintained a regional northwest flow, while westward-oriented drainages would have been glaciated by down-valley flowing ice. Retreat of the Cassiar lobe to the east of the north-south trending drainage divide resulted in ponding of meltwater in the eastern drainages. This meltwater drained westward across mountain passes and flowed down the western drainages shortly after these were deglaciated. Meltwater erosion was significant enough in some valleys to erode through the surficial deposits and into bedrock, which would have completely reworked pre-existing placer deposits.

A late glacial re-advance of local alpine glaciers (Phase 4) was mapped in the Pelly Mountains further east, however in the Big Salmon Range; the glaciers are less abundant and generally restricted to less than 1 km in extent.



- GLACIATION**
- McConnell Ice-Flow Phases**
    - Phase 1: [Symbol] [Symbol]
    - Phase 2: [Symbol] [Symbol]
    - Phase 3: [Symbol] [Symbol]
    - Phase 4: [Symbol] [Symbol]
  - Glacial Landforms**
    - medial moraine channel: [Symbol] (the Sub-July 1983)
    - moraine: [Symbol] (the Sub-July 1983)
    - glaciotectonically aligned landforms: [Symbol] (the Sub-July 1983)
- McConnell Ice-Flow Phases**
- Phase 1**: [Symbol] [Symbol]
  - Phase 2**: [Symbol] [Symbol]
  - Phase 3**: [Symbol] [Symbol]
  - Phase 4**: [Symbol] [Symbol]
- Glacial Landforms**
- medial moraine channel: [Symbol] (the Sub-July 1983)
  - moraine: [Symbol] (the Sub-July 1983)
  - glaciotectonically aligned landforms: [Symbol] (the Sub-July 1983)
- Livingstone Winter Trail**
- Placer baseline unsurveyed
  - Surveyed baselines
- Placer Claims**
- Active, Pending
  - Placer Lease
  - Active, Pending

Scale 1:50,000  
 UTM Zone 8N  
 Datum NAD 83

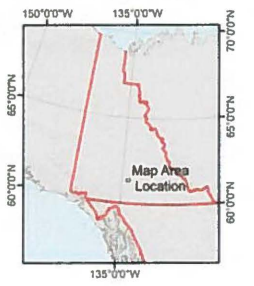


Figure 5 - Surficial geology and glacial features, Livingstone Creek area; after Klassen and Morison, (1987); and Bond and Church, (2006).

## Placer Geology and Stratigraphy

Overall, the placer gold-bearing creeks in the Livingstone area are characterized by a sequence of interglacial stream gravels which are overlain by McConnell-age glaciolacustrine silts, glaciofluvial deltaic sandy gravel and boulder-rich glacial till (Levson, 1992). Within the interglacial gravels, concentrated fluvial and debris flow sedimentation likely occurred in response to unusually high storm or spring runoff events. The advance of a glacier down the South Big Salmon River valley resulted in damming of the channelized flows that deposited the underlying gravels. Ice-marginal lakes formed in each of the tributary valleys, and parallel-laminated clays, silts and sands were deposited in the ice-dammed lakes along with debris flow deposits derived mainly from the ice margin. At Summit Creek, a thick glaciofluvial delta complex developed in the lake ponded in that valley. As the glacier in the South Big Salmon River valley expanded, the lakes diminished in size and debris flow sedimentation increased until the area was overridden by ice. Subsequently, a thick till was deposited at the base of the glacier. During deglaciation, a glaciofluvial complex developed along the ice margin. The series of meltwater channels that extend from south of Martin Creek to well north of Summit Creek, formed along the side of the South Big Salmon Valley in association with the ice-marginal deposits. Post-glacial river erosion incised through all of the overlying glacial deposits and re-exposed the placer gold bearing interglacial gravels.

The stratigraphy of Livingstone Creek in the lower reaches as described by Levson (1992) consists of approximately 5 metres (15 feet) locally-derived, coarse-grained, crudely-stratified, poorly-sorted and clast-supported gravels immediately overlying the bedrock. This is the main pay unit, and is interpreted as an interglacial (pre-McConnell) high energy stream channel and gulch sediments deposited by channelized fluvial flows and gravelly debris flows. This unit is overlain by up to 5 metres (15 feet) of parallel-laminated silts and clays with numerous erratic dropstones and pebble intrabeds. This unit is interpreted as proximal glaciolacustrine sediment, which would have formed when a glacier, flowing down the South Big Salmon River valley, blocked Livingstone Creek and other tributaries, causing small ice-marginal lakes to form. A thick, 15 metre (50 feet) matrix-supported diamicton with numerous striated clasts caps the sequence. This is interpreted as a glacial till, deposited directly by ice during the glacial maximum.

Early workers (Cairnes, 1910; Bostock and Lees, 1938) describe an “old boulder channel” on the south side of Livingstone creek, which was quite rich in placer gold. The “old channel” is described as being lower in gradient than the present channel, and within “half a mile” upstream of the canyon (800 m) is about 40 feet (12 metres) lower than the present channel and 1000 feet (300 metres) to the south. The present channel and the paleochannel are separated by a reef of bedrock which was tunneled through by the old timers. The placer gold was reported to lie on bedrock and in the crevices in it.

Cairnes (1910) reported that at some distance up the present creek channel, at a point across from the higher workings in the old, buried channel, a second buried channel is reported to have been discovered on the north side of the creek. An adit was run along it, but the results of that work were not known.

Subsequent placer miners are believed to have worked various parts of the south paleochannel, and gravels adjacent and north of the present creek by sniping under the overburden on the north bank.

## September 2020 Placer Exploration Program

### Resistivity Surveys

#### Overview

A program of resistivity geophysical surveys was conducted between September 17 and 19, 2020. Two lines totalling 545 metres were conducted on a right limit tributary of Livingstone Creek, and in the South Big Salmon valley. Figures 6 and 8 show the location of the resistivity surveys and Table 3 shows the coordinates and other details of the survey lines.

Table 3 - Geographic coordinates and lengths of resistivity lines, Livingstone Creek area, September, 2020.

Livingstone Creek area Resistivity Surveys, September 2020						
			Start Point		End Point	
Name	Claim or Lease	Length (m)	Latitude	Longitude	Latitude	Longitude
RES20-LIV2M-01	IW00733	210	61.342278	-134.29453	61.34390	-134.29536
RES20-SBS-01	WADE 2	335	61.366609	-134.37764	61.36602	-134.38324

#### Personnel and Methodology

The geophysical surveys were conducted, processed and interpreted by William LeBarge of Geoplacer Exploration Ltd., with field assistance by Adam Sternbergh. The Lippmann 4-Point Light Resistivity System was used, and this technique injects an electrical current into the subsurface through stainless steel spikes and then measures the remaining voltage at various distances away from the injection point. Ground materials have different resistances to the current, and give data points in a cross section of the subsurface. With the data points, a tomogram or pseudo section can be created representing changes of resistivity in the ground. Data was collected using Geotest software, while the inversion and data filtering was completed with RES2DINV software. Data points with poor contact resistance were exterminated and noisy data was filtered statistically with root mean squared data trimming. Two-dimensional tomograms were produced using least squares damped inversion parameters to display the resistivity properties and to display potential contacts.

#### Limitations and Disclaimer

The interpreted sections provide an estimate of the conditions beneath the surface to the depths conducted and are within the accuracy of the system and methods. The data becomes more uncertain with depth and are more accurate toward the surface and is further complicated if there is permafrost present in the region. The materials are interpreted based upon local geology observed, as well as geologic knowledge of the area. Certain materials may be similar in composition and result in uncertain results. The accuracy of the information presented is not guaranteed and all mine development is the client's responsibility. William LeBarge of Geoplacer Exploration Ltd. accepts no liability for any use or application of these data by any and all authorized or unauthorized parties.

## Results

Figures 7 and 9 show the interpreted resistivity profiles from the two surveys. Overall, contact resistance was low and resulting data quality was good.

Resistivity survey line RES20-LIV2M-01 was conducted about mid-way up the unnamed right limit Livingstone tributary where prospecting lease IW00733 is located. Glacial till, boulder gravel and bedrock are interpreted in the profile with significant contacts at the target location at 6 m and 15 m below surface. A possible south-dipping fault shows in the profile, which may be the subsurface expression of a fault shown on Figure 4 approximately 1 km to the north of the survey line. Bedrock rising to the north is consistent with surficial mapping shown on Figures 5 and 6.

Resistivity survey line RES20-SBS-01 was surveyed on the WADE 2 placer claim in the South Big Salmon river valley. Interpreted units in the profile include a surface layer of boulder-rich gravel overlying a less resistive layer which may be a glacial till and glacial silt. Two potential target areas were chosen, with significant contacts at 8-10 m and 12-13 m below surface. Bedrock is somewhat undulating and interpreted at between 8 m and 14 m below surface.

The coordinates and depths of the targets of the resistivity surveys are shown in Table 4.

Table 4 - Coordinates of targets from 2020 Resistivity surveys, Livingstone project.

Resistivity Line	Claim/Lease	Target name	Depth (m)	Latitude DD	Longitude DD
RES20-SBS-01	WADE 2	RES20-SBS-01-01	10	61.36661	-134.378293
RES20-SBS-01	WADE 2	RES20-SBS-01-02	8	61.366121	-134.381005
RES20-LIV2M-01	IW00733	RES20-LIV2M-01-01	6	61.343043	-134.295325

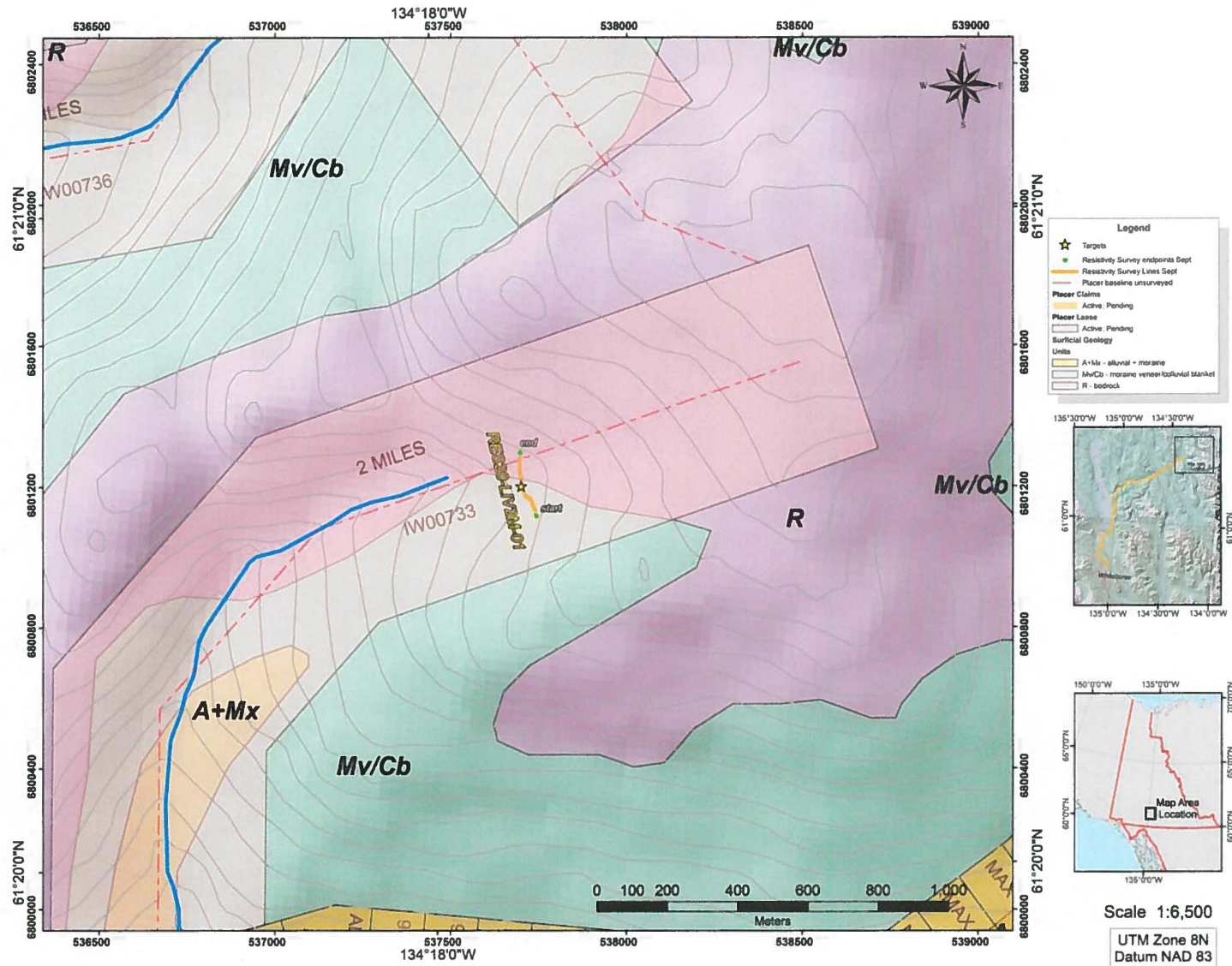


Figure 6 – Location of the resistivity survey RES20-LIV2M-01 conducted on an unnamed right limit Livingstone Creek tributary, on prospecting lease IW00733, in September 2020.

RES20-LIV2M-01 dd \* non-conventional or general array

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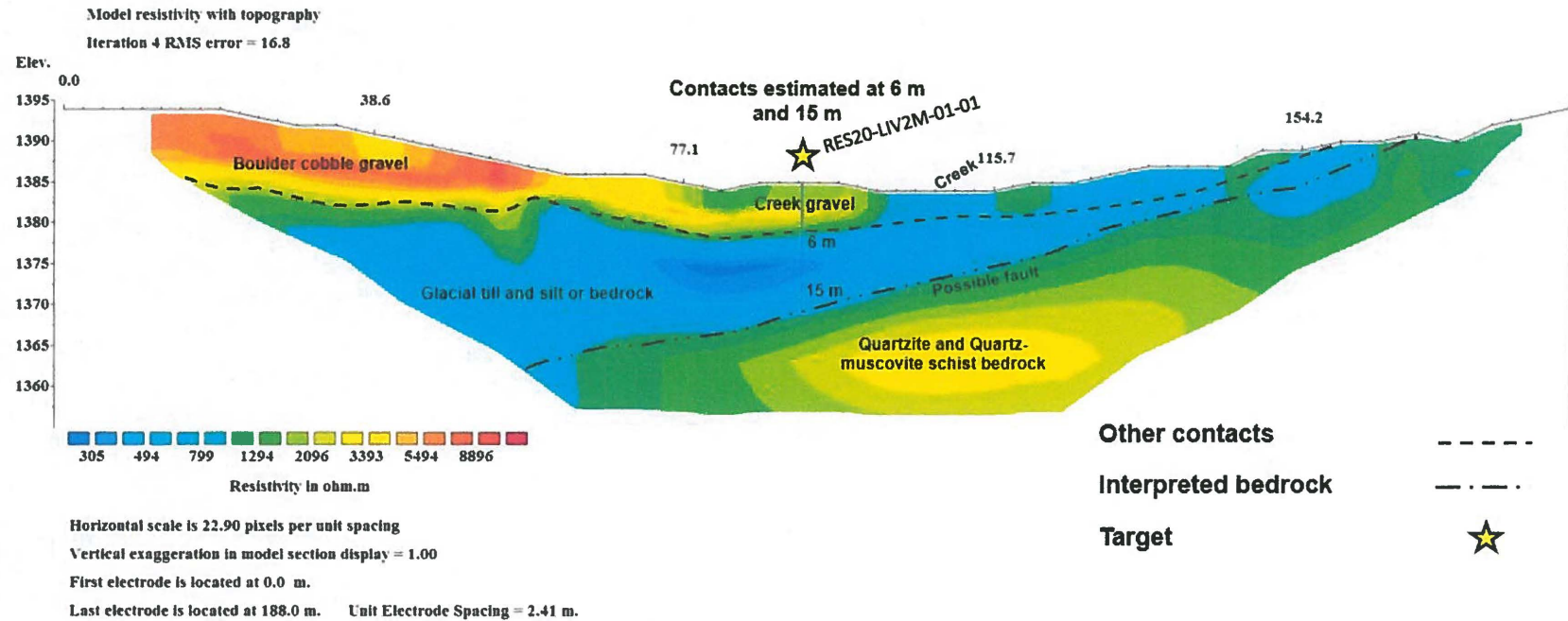


Figure 7 – Resistivity survey line RES20-LIV2M-01 was conducted about mid-way up the unnamed right limit tributary where prospecting lease IW00733 is located. Glacial till, boulder gravel and bedrock are interpreted in the profile with significant contacts at 6 m and 15 m below surface.

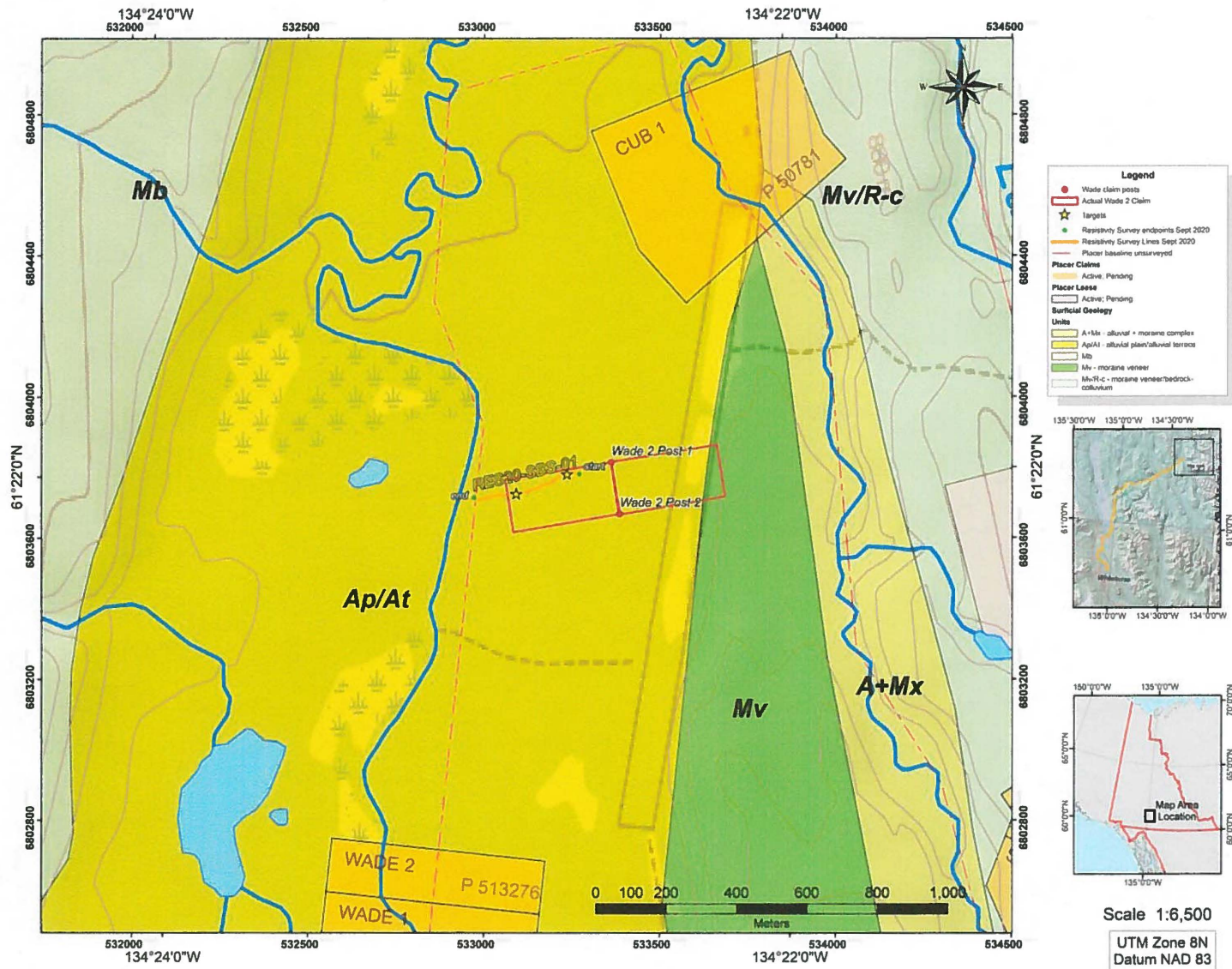


Figure 8 - Location of the resistivity survey RES20-SBS-01 conducted in the South Big Salmon river valley, on placer claim WADE 2, September 2020. Note that the actual location of claim WADE 2 is different than that shown on the Yukon Government map.

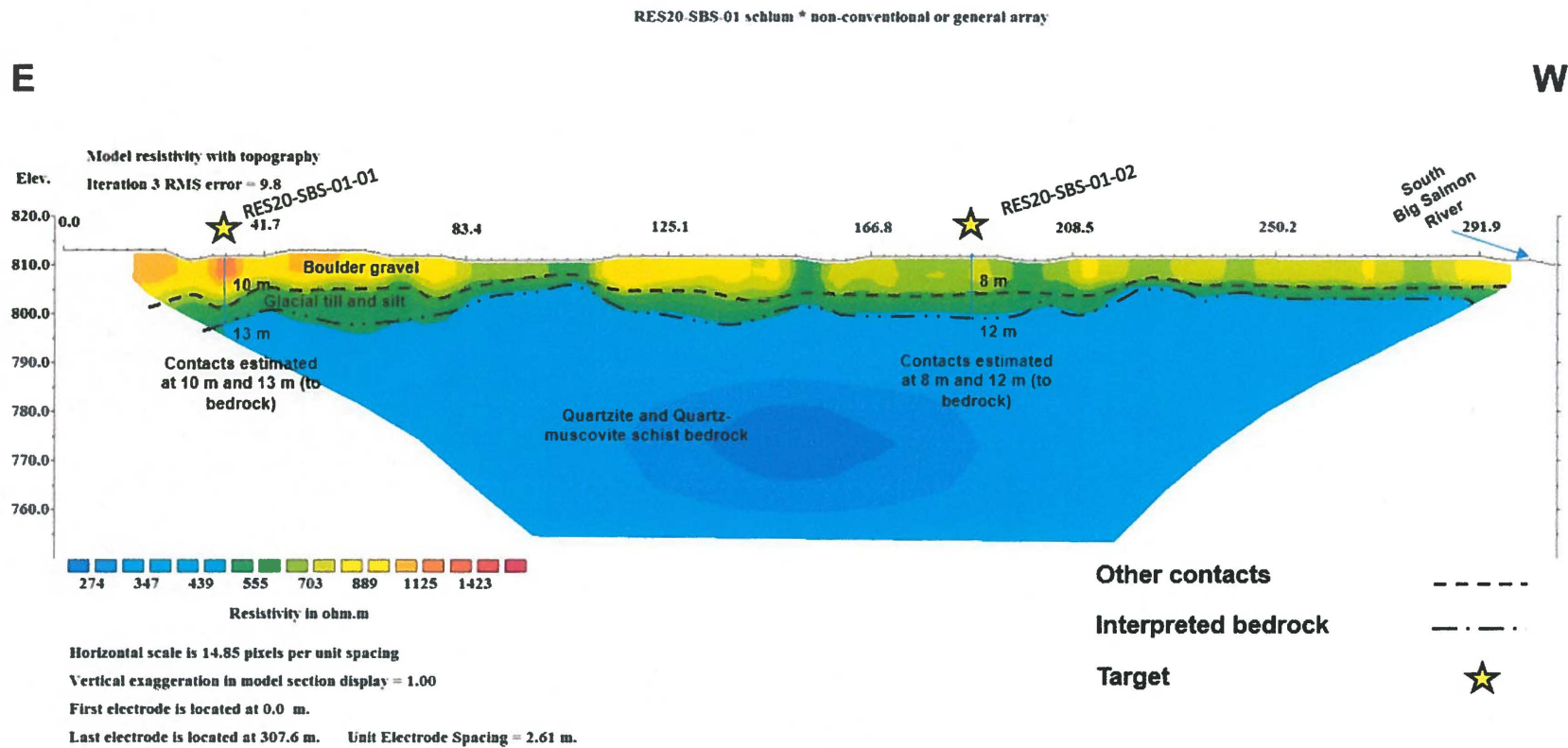


Figure 9 – Resistivity survey line RES20-SBS-01 was surveyed on the WADE 2 placer claim in the South Big Salmon river valley. Interpreted units in the profile include a surface layer of boulder-rich gravel overlying a less resistive layer which may be a glacial till and glacial silt. Two potential target areas are shown, with significant contacts at 8-10 m and 12-13 m below surface. Bedrock is somewhat undulating and interpreted at between 8 m and 14 m below surface.

## Conclusions and Recommendations

Overall, contact resistance was low in the resistivity surveys and resulting data quality was good.

On resistivity survey line RES20-LIV2M-01, glacial till, boulder gravel and bedrock are interpreted with significant contacts at 6 m and 15 m below surface. A possible south-dipping contact may be the subsurface expression of a fault shown on the bedrock map as approximately 1 km to the north of the survey line.

On resistivity survey line RES20-SBS-01 in the South Big Salmon river valley, interpreted units in the profile include a surface layer of boulder-rich gravel overlying a less resistive layer which may be a glacial till and glacial silt. Two potential target areas were chosen, with significant contacts at 8-10 m and 12-13 m below surface. Bedrock is somewhat undulating and interpreted at between 8 m and 14 m below surface.

In both surveyed areas, the target zones lie between 6 m and 10 m below surface, which is within reach of a medium to large excavator. Testing of the targets by a series of excavator pits along the lines is therefore recommended to these depths.

Additional cross-valley resistivity surveys are recommended in both areas, in order to better delineate the orientation, depth and extent of any potential buried gravel channels.

If possible, a drill should be brought in to confirm interpreted depths and sample the gold content of the deeper targets. Given the boulder-rich nature of the ground, the drill should either be a cased reverse circulation (R/C) drill (which has an inside diameter of 6 inches or greater) or a similarly-sized sonic drill.

The project area would also benefit from updated areal imagery from a UAV drone survey.

## Statement of Qualifications

### William LeBarge

I, William LeBarge, of 13 Tigereye Crescent, Whitehorse, Yukon, Canada, DO HEREBY CERTIFY THAT:

1. I am a Consulting Geologist with current address at 13 Tigereye Crescent, Whitehorse, Yukon, Canada, Y1A 6G6.
2. I am a graduate of the University of Alberta (B.Sc., 1985, Geology) and the University of Calgary (M.Sc., 1993, Geology – Sedimentology)
3. I am a Practicing Member in Good Standing (#37932) of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC).
4. I have practiced my Profession as a Geologist continuously since 1985.
5. I am President and sole shareholder of Geoplacer Exploration Ltd., a Yukon Registered Company.

Dated this 18<sup>th</sup> day of January, 2021

William LeBarge, P. Geo.

A handwritten signature in blue ink that reads "William LeBarge". The signature is written in a cursive style with a large initial 'W' and 'L'.

## References

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