# YMEP Exploration Final Report Lake Creek

# **YMEP Grant # 2020-001**

## NTS Map 105E/08

Whitehorse, Yukon Lease # IW00735, IW00737

**Claims JENAB 1-4** 

Whitehorse Mining District

**Yukon Territory** 

BY Kirk Potter 01/31/2021

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### **Overview**

The following is the final report on placer exploration work completed in the 2020 season on two one mile (1) Placer Prospecting Leases on Lake Creek, Yukon. This work program was a component in a multi-year regional program seeking to evaluate mineral and placer potential within the Livingstone area Gold Fields. Although significant quantities of gold have been withdrawn from the district throughout the past 120+ years the majority of the potential remains unexplored, largely due to difficulties testing gravels with thick glacial cover, and the remote nature of the prpoerty; only road access is a very long Winter road that includes a large ice-bridge across the Teslin River. The described exploration work was completed with assistance from the YMEP program.

### **Location**

The Lake Creek placer project is located 61°21′50″N and 134°19′18″W; on NTS map sheet 105E/08, in the Whitehorse Mining District. Lake Creek is a right limit tributary of the South Big Salmon River. See **Figure 1** 

#### Access

Access to the property from Whitehorse can be gained by fixed-wing, helicopter or winter road that is only available at the height of winter season. See **Figure 2**.

There are several intermittently maintained bush air strips, and several ATV trails and old CAT roads to traverse the field area. A 1700 meter airstrip is situated in the South Big Salmon river valley near Lake Creek. The coordinates of that airstrip are 61°21′58″N and 134°22′19″W.

## **Placer Tenure**

Table 1 Details the status of the Lake Creek claims and prospecting leases.

Grant Number	Status	Legth/Name	Claim	Staking	Recording	Expiry Date
			Owner	Date	Date	
IW00735	Active	1 Mile	Daniel	2020-04-02	2020-04-14	2022-05-10
			Aitken-			
			100%			
IW00737	Active	1 Mile	Logan	2020-04-02	2020-04-15	2022-05-11
			Potter-			
			100%			
P12170	Active	JENAB I	Kirk Potter-	1981-05-20	1981-05-21	2022-11-20
			100%			
P12171	Active	JENAB II	Kirk Potter-	1981-05-20	1981-05-21	2022-11-20
			100%			
P12172	Active	JENAB III	Kirk Potter-	1981-05-20	1981-05-21	2022-11-20
			100%			
P12173	Active	JENAB IV	Kirk Potter-	1981-05-20	1981-05-21	2022-11-20
			100%			

## **Work History**

The Livingstone 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.

Lake Creek was first prospected and staked during the 1898 rush to the Livingstone placer gold camp. Some small scale mining was done in the early 1900's, but by 1915 the creek was deserted and it was not until 1930 when T. Kerruish made a new discovery that any work was done. That year Mr. Kerruish installed a hydraulic plant and mined the creek nearly every year until his death in 1944. His claims were kept in good standing by Beada Louise Kerruish until 1954. In the spring of 1959 G. Murdoch and J. Ballentine staked the ground on lake creek, which they worked a small scale until 1961.

During 1973 two small operations were on the creek; G. Asuchak and T. Ames/E.Hill. Mr.Asuchak continued on a small-scale until 1982 season. In 1983 E. Kosmenko began work on Lake Creek, and he has held the ground and optioned it to various operators until selling the property to Kirk Potter. Yukon Government royalty records show 653 ounces recovered from Lake Creek. Previous historic data has said that over \$40,000 in gold was recovered in the past, at much lower gold price than those of today (LeBarge, 2007).

### **Bedrock Geology**

The Livingstone District is underlain primarily by meta-sedimentary and meta-igneous rocks of Yukon Tanana Terrane, and is bounded on the west with late Palezoic volcanic and sedimentary rock (Semenof Formation) along the Big Salmon Fault. The Semenof block is assigned to Quesnellia Terrane, and those units are bounded on the west by meta-sedimentary rocks of the Stikinia terrane (Colpron,2006)

East and north of the South Big Salmon River lie five successions of meta sedimentary and meta volcanic rocks: the Snowcap complex, and the Livingstone creek, Mendocina, Last Peak and Dycer Creek successions(Colpron, 2006).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). See **Figure3**.

**Figure 4** shows that the lower reaches of Lake creek are dominated by quartzite, quartz-muscovite schist and meta sedimentary rocks(map unit PDS1) of the Snowcap complex. In Upper Lake creek, rocks include NW-trending black carbonaceous phyllite and schist (map unit PDS6). An outcrop of calcareous chloric schist(map unit PDS3) partially transects Lake Creek at its middle reaches(Colpron, 2006; 2017).

## **Surficial Geology**

The Livingstone District lies 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.

Galcial fatures and surficial deposits in the livingstone District were mapped by Hughes et al(1969), Klassen and Morison (19870 and later 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 flows Livingstone, Lake and Summit Creeks is an ice-marginal channel (Hughes et al, 1969).

Indicators of former ice flow direction, mapped by Hughes et all(1969) and klassen and Morrison(1987) suggest that glaciers flowed north along the low valleys that cross the Semenof Hills into the South Big Salmon River Valley.

The Placer gold-bearing creeks in the Livingstone area (including Lake creek) 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).

On Lake Creek, regional ice flow initially blocked the lower reaches of the drainage, filling the valley with glaciolacustrine silts and clays and glaciofluvial gravels, and covering the gold-bearing interglacial placer gravels. As the ice sheet thickened, it crossed over the drainage transversely from the south to north, and deposited a blanket of till which was later dissected by post-glacial meltwater (Levson,1992).The Placer gold-bearing interglacial placer gravels were re-exposed by this down-cutting, which allowed their subsequent exploitation by historic and modern-day placer miners. **Figure 5**.

### **Personnel and Dates of Work-SAMPLING**

Between the dates July25, 2020- November 15, 2020 2 separate programs (geophysics and test pits) were completed and rehabilitated on Leases IW00735, IW00737 and JENAB claims by

Geoplacer Exploration Ltd. and the Potter field crew consisting of Ben Sternbergh, Adam Sternbergh, Dan Aitken, Riley Gibson, Alycia Aitken and Ed Kosmenko.

The trenching program focused on digging an upper trench (upper lease IW00737) and mid level 5trench (JENAB 2) and a lower pit (lower lease IW00737) in order to test the sediments for gold, search for bedrock contacts and get a feeling for the relative stratigraphic context of sediments over the 3/4 mile reach of Lake Creek. Test trenches were located in convenient areas near past workings. The three trenches were excavated to approximate dimensions of (4m by2m by 2m). Sampling was to be completed with a small Keene wash plant (highbanker) that recovers fine gold, however freeze up came early and the small pump and required hoseline split unexpectedly. As a result only hand panning was completed, although the proponents expect to sluice the material through the small highbanker as originally planned. A larger more representative sample is required in addition to the basic hand panning conducted. Samples were excavated using a John Deere 590 15 ton Excavator on Leases and JENAB claims.

#### **Trench 1**

The dimensions of Trench 1 were 4m (deep) x2 m x 2 m excavated on the right limit of Lake Creek on a low level bench. The upper 1.5 m of the trench was interpreted as tailings from previous operations, followed by 2 metres of a bouldery gravel till. The lowest unit (3.5-4m) was a rusty, quartzy pebble-gravel sitting on a weak unconsolidated clay rich bedrock contact. Significant mixing between the lowest gravel and unconsolidated bedrock was obvious, exhibited by a high percentage of clay and angular clasts within the lowest gravel. Gold was limited to the lowest gravel and was sporadic with values ranging from 0 - 10mg pans. Average pans contained ~2-3 mg generally as one or two poppy seed size chunks of gold.

#### **Trench 2**

The dimensions of Trench 1 were 4m (deep) x2 m x 2 m excavated on the right limit of Lake Creek on a low level bench on claim JENAB 2. The upper 1 m of the trench was interpreted as tailings from previous operations, followed by 2.5 metres of a bouldery gravel till. The lowest unit (3.5-4m) was a rusty, quartzy pebble-gravel sitting on a weak unconsolidated clay rich bedrock contact. Significant mixing between the lowest gravel and unconsolidated bedrock was obvious, exhibited by a high percentage of clay and angular clasts within the lowest gravel. Gold was limited to the lowest gravel and was sporadic with values ranging from 0 - 10mg pans. Average pans contained  $\sim$ 2-3 mg generally as one or two poppy seed size chunks of gold.

#### **Trench 3**

Trench 3, dug on the lower lease to a depth of 4 m found only tailings/anthroprogenic sediments. This was interpreted as an old filled in pit from previous operations. No gold was recovered from the site of the third trench.

#### Creek

Figure 6 outlines the relative location of each trench.

Samples from trenches were panned but none of the samples recovered economic values. Table 1 details the results of the excavator test pitting. Although alluvial gravels were encountered they occurred in shallow lenses and did not contain economic placer deposits (<0.3 g/yd<sup>3</sup>).

#### **Table 1: Excavator Trench Sample Results**

Trench #	Depth of	Material	Economic	Easting (X)	Northing(Y)
	Trench		Gold		
	(meters)		Yes or No		
20-Trench-1	~4 m	Surface Gravel	No	856283 W	6821551 N
20-Trench-2	~4 m	Surface Gravel	No	856503 W	6821542 N
20-Trench-3	~4 m	Surface Gravel	No	856972 W	6821631 N

## **GeoPlacer Exploration Work & Conclusion**

Geoplacer Exploration Ltd. was hired as a contractor to complete a Aerial Imagery Survey and also to complete a Geophysical Resistivity Survey on the Lake creek claims and leases in table 1. The high resolution imagery obtained by the drone allowed for identification of landforms and geomorphology which would not have been possible with existing available public online satellite imagery. Interpreted geomorphology on the orthomosiacs and the Digital Terrain Models(DTM) showed several surficial features which are not shown on the available public geology maps. These include a remnant glacial moraine, several cross-valley meltwater channels and a dissected kame terrace(glaciofluvial gravels). Although not mapped, these geomorphic features are consistent with surficial mapping and ice-flow patterns in the drainage as previously defined by Bond and Church(2006) and Klassen and Morison(1987)

Overall, contact resistance was low in the resistivity surveys and resulting data quality was good. Bedrock was interpreted to be 12 m from surface on the longitudinal line(RES20-LAKE1M-01) and up to 16 m deep in the upstream cross-valley line(RES20-JENAB1-01). A buried boulder gravel channel was interpreted on line RED20-LAKE1M-01 at 8m below surface, which correlates well with observations of the mining exposure on the right limit of the creek below the survey. A potential gravel channel was interpreted in a bedrock deoression on line RES20-JENAB1-01, at approximately 12 m below surface, and approximately 90 m from the start of the line. Bedrock appears to be relatively flat for the first 85 meters of the line(starting on the right limit or northside) although the thickness of overburden steadily climbs towards the left limit.

Areas on Lake Creek with remaining prospective placer gold potential are shown in Figure 17 of the Geoplacer Report. This map illustrates the interpreted geomorphological features including cross-valley meltwater channels and the potential buried paleochannel on the upstream unmined left limit.

Meltwater channels may have provided areas of pre-concentration in the valley which would increase the values of placer gold in the overlying sediments. Additionally the places where the melt water channels transect the Lake Creek valley may be the locale for inflection points in the valley gradient, which could also correspond with increased placer gold values. These areas should be targeted in future exploration programs.

Additional cross-valley resistivity surveys are recommended upstream of RES20-JENAB-01, in order to better delineate the orientation, depth and extent of the potential buried gravel channel on the left limit.

If possible, a drill should be brought in to confirm interpreted depths and sample the gold content of the channel. Given the boulder-rich nature of the ground, the drill should either be a caed reverse circulation(R/C) drill (which has an inside diameter of 6 inches or greater) or similarly-sized sonic drill. If drilling is not logistically possible, slow progress may be made progressively upstream ny stripping the active mining cut face using mechanical or hydraulic means.

## **Total Expenditures**

ltem	Cost/day	Days/Quantity	Total
Labour	\$275	16	\$4400
Truck Cost	\$50/day/truck	7	\$350
Field Expenses	\$100	16	\$1600
Atv&Trailer Rental	\$484	1	\$484
Chainsaw	\$20	3	\$60
Tintina Air Invoice	\$1470	1	\$1470
Alpine Aviation(Yukon)Ltd.	\$577.50	1	\$577.50
GeoPlacer Invoice(Resistivity Survey)	\$4989.60	1	\$4989.60
GeoPlacer Invoice(Drone Survey)	\$1050	1	\$1050
Star Mountain Resources	\$4819.50	1	\$4819.50
Report Writing	10%	1	\$1980.1
Total	*	1	\$21,781.6

## **Statement of Qualifications**

I, Kirk Potter, Prospector, certify that:

- 1) I reside at 56 Alsek Road, Whitehorse, Yukon, Y1A 3K4.
- 2) I have spent time prospecting on and around the target area.
- 3) 10 Years Prospecting Experience.

Dated this28day of	January	2021, at Whitehorse, Yukon.
Kirk Potter (Prospector)		

**Figures & Appendices** 









Figure 6 - Surficial geology of Lake Creek (after Klassen and Morison, 1987).







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### **Report on 2020 Placer Exploration Program**

### Lake Creek, YMEP Grant #2020-001

### Whitehorse Mining District, Yukon Territory

for

#### **Kirk Potter**

by

William LeBarge, P. Geo.

Geoplacer Exploration Ltd.

Location of centre of property: 61°21'50"N and 134°19'18"W NTS map sheet: 105E/08 Mining District: Whitehorse Date: December 13, 2020

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## **Executive Summary**

The following is a report on the 2020 placer exploration program on Lake Creek, under YMEP Grant #2020-001, for Kirk Potter, by Geoplacer Exploration Ltd. The Lake Creek 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.

Yukon Government royalty records currently show 653 ounces recovered from Lake Creek. Lake Creek surficial geology is characterized by a sequence of interglacial stream gravels (pay gravels) which are overlain by McConnell-age glaciolacustrine silts, glaciofluvial deltaic sandy gravel and boulder-rich glacial till.

Lake Creek was first prospected and staked during the 1898 rush to the Livingstone placer gold camp. Some small-scale hand mining was done during the early 1900's, but by 1915 the creek was deserted, and it was not until 1930 when T. Kerruish made a new discovery that any work was done. His claims were kept in good standing by until 1954. In the spring of 1959 G. Murdoch and J. Ballentine staked ground on Lake Creek, which they worked on a small scale until 1961. During 1973 two small operations were on the creek; G. Asuchak and T. Ames/E. Hill. Mr. Asuchak continued on a small scale until the 1982 season. In 1992, W. Carrell and D. Gonder Jr. tested ground near the headwaters of the creek. In 1983, E. Kosmenko began work on Lake Creek, and he has held the ground and optioned it to various operators until the present day.

Interpreted features from the high resolution imagery obtained by the drone include a remnant glacial moraine, several meltwater channels and a dissected kame terrace (glaciofluvial gravels).

Resistivity surveys showed that bedrock was interpreted to be 12 m from surface on the longitudinal line (RES20-LAKE1M-01) and up to 16 m deep in the upstream cross-valley line (RES20-JENAB1-01). A buried boulder gravel channel was interpreted on line RES20-LAKE1M-01 at 8 m below surface, which correlates well with observations of the mining exposure on the right limit of the creek below the survey. A potential gravel channel was interpreted in a bedrock depression on line RES20-JENAB1-01, at approximately 12 m below surface, and approximately 90 m from the start of the line.

Future placer exploration programs should consist of additional cross-valley resistivity surveys upstream of RES20-JENAB1-01, in order to better delineate the orientation, depth and extent of the potential buried gravel channel on the left limit. If possible, a drill should be brought in to confirm interpreted depths and sample the gold content of the channel. 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. If drilling is not logistically possible, slow progress may be made progressively upstream by stripping the active mining cut face using mechanical or hydraulic means.

Placer gold potential remains in other parts of Lake Creek, including on unmined portions of the right limit and where meltwater channels have transected the valley. These areas should also be investigated.

## Introduction

The following is a report on the 2020 placer exploration program on Lake Creek, under YMEP Grant #2020-001, for Kirk Potter, by Geoplacer Exploration Ltd.

### **Location and Access**

Lake 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 centre of the Lake Creek property is located at 61°21'50"N and 134°19'18"W; on NTS map sheet 105E/08, in the Whitehorse Mining District. Lake Creek is a right limit tributary of the South Big Salmon River (Figure 3).

Access to the property 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 Lake Creek Project, Yukon.

## **Placer Tenure**

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

Grant Number	Status	Length/Name	Claim Owner	Staking Date	Recording Date E	xpiry Date
IW00735	Active	1 mile	Daniel Aitken - 100%	2020-04-02	2020-04-14	2022-05-10
IW00737	Active	1 mile	Logan Potter - 100%	2020-04-02	2020-04-15	2022-05-11
P12170	Active	JENAB I	Kirk Potter – 100%	1981-05-20	1981-05-21	2022-11-20
P12171	Active	JENAB II	Kirk Potter – 100%	1981-05-20	1981-05-21	2022-11-20
P12172	Active	JENAB III	Kirk Potter – 100%	1981-05-20	1981-05-21	2022-11-20
P12173	Active	JENAB IV	Kirk Potter – 100%	1981-05-20	1981-05-21	2022-11-20

### Table 1 – Claims and Prospecting Lease Status, Lake Creek.



Plate 1 - View of Lake Creek, looking downstream (west). Photo taken September 20, 2020.



Figure 2 - Location of Lake 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**

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.

Lake Creek was first prospected and staked during the 1898 rush to the Livingstone placer gold camp. Some small-scale hand mining was done during the early 1900's, but by 1915 the creek was deserted, and it was not until 1930 when T. Kerruish made a new discovery that any work was done. That year, Mr. Kerruish installed a hydraulic plant and mined the creek nearly every year until his death in 1944. His claims were kept in good standing by Beada Louise Kerruish until 1954. In the spring of 1959 G. Murdoch and J. Ballentine staked ground on Lake Creek, which they worked on a small scale until 1961.

During 1973 two small operations were on the creek; G. Asuchak and T. Ames/E. Hill. Mr. Asuchak continued on a small scale until the 1982 season. In 1992, W. Carrell and D. Gonder Jr. tested ground near the headwaters of the creek. In 1983, E. Kosmenko began work on Lake Creek, and he has held the ground and optioned it to various operators until the present day. Yukon Government royalty records currently show 653 ounces recovered from Lake Creek. Previous historic data has said that over \$40,000 in gold was recovered in the past, at much lower gold prices than those of today (LeBarge, 2007).

## **Bedrock Geology**

The Livingstone District is underlain primarily by metasedimentary and meta-igneous rocks of Yukon-Tanana Terrane, and is bounded on the west with late Paleozoic volcanic and sedimentary rocks (Semenof Formation) along the Big Salmon Fault. The Semenof block is assigned to Quesnellia Terrane, and those units are bounded on the west by metasedimentary rocks of the Stikinia terrane (Colpron, 2006).

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; Figure 4). 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 (Figure 4; Colpron, 2017).

Figure 5 shows that lower reaches of Lake Creek are dominated by quartzite, quartz-muscovite schist and metasedimentary rocks (map unit PDS1) of the Snowcap complex. In upper Lake Creek, rocks include NW-trending black carbonaceous phyllite and schist (map unit PDS6). An outcrop of calcareous chloritic schist (map unit PDS3) partially transects Lake Creek at its middle reaches (Colpron, 2006; 2017).

## **Mineral Occurrences**

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

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

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



Figure 4 - Bedrock Geology of Livingstone District, modified after Colpron, (2017) and Yukon Geological Survey, (2018).



Figure 5 - Bedrock geology of Lake Creek (after Colpron, 2017).

## Surficial Geology and Glacial History

The Livingstone District lies 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.

Glacial features and surficial deposits in the Livingstone District were mapped by Hughes et al (1969), Klassen and Morison (1987) and later 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 flows of Livingstone, Lake 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.

The placer gold-bearing creeks in the Livingstone area (including Lake Creek) 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).

On Lake Creek, regional ice flow initially blocked the lower reaches of the drainage, filling the valley with glaciolacustrine silts and clays and glaciofluvial gravels, and covering the gold-bearing interglacial placer gravels. As the ice sheet thickened, it crossed over the drainage transversely from south to north, and deposited a blanket of till which was later dissected by post-glacial meltwaters (Levson, 1992). The placer gold-bearing interglacial placer gravels were re-exposed by this down-cutting, which allowed their subsequent exploitation by historic and modern-day placer miners.



Figure 6 – Surficial geology of Lake Creek (after Klassen and Morison, 1987).

## **September 2020 Placer Exploration Program**

### **Aerial Imagery Surveys**

#### **Overview**

High-resolution satellite imagery and recent airphoto coverage is not available for many parts of the Yukon. Much of the imagery available online is unusable due to its low resolution, the presence of cloud cover, or it is simply outdated and no longer representative of the current geomorphology. Therefore, to aid in exploration and mine planning, a program of aerial imaging surveys was conducted on Lake Creek on September 20, 2020. Figures 7 to 13 show the processed orthomosiac images and 3D reconstructions of Lake Creek including the areas of Prospecting Leases IW00735 and IW00737 and Placer Claims JENABI-JENABIV. These images are also included as Appendix A.

#### **Personnel and Methodology**

The aerial imaging survey was conducted and processed and interpreted by William LeBarge of Geoplacer Exploration Ltd.

The type of drone used is a DJI Mavic 2 Pro, which has a high-resolution Hasselblad camera with a 1 inch photo sensor. Flight planning was done with the Pix4D capture program, and at least 80% overlap of photos was planned between photos within a flight line and between flight lines. Initial processing of the aerial survey is done in the field to check for integrity and data quality.

Final processing of air photos began with image editing software to normalize any extreme contrasts or unusual color balancing needed within the photo sets. A georeferenced orthophoto mosaic and 3D digital terrain model were then generated using Pix4D and Global Mapper software. The orthomosiac images and 3D models were interpreted for the presence of any obvious geomorphic landforms and anthropogenic features such as old mine workings and trenches.

#### Interpretation

The high resolution imagery obtained by the drone allowed for identification of landforms and geomorphology which would not have been possible with existing available public online satellite imagery. Figures 7 to 13 show the interpreted geomorphic features on the orthomosiacs, as well as the Digital Terrain Models (DTM) and 3D renderings generated in Pix4D and Global Mapper from the aerial drone images. Obvious features include a remnant glacial moraine, several meltwater channels and a dissected kame terrace (glaciofluvial gravels). These features are consistent with the surficial mapping and ice-flow patterns in the drainage as defined by Bond and Church (2006) and Klassen and Morison (1987).

There may be increased placer potential in Lake Creek valley where it was transected by the meltwater channels, as the high rate of water flow in these zones would have had a concentrating and placer forming effect on the glacial sediments prior to the development of the modern Lake Creek valley. These areas should also be investigated in future exploration programs.





#### Figure 8 - Drone image of Placer claims JENAB1 to JENAB IV with interpreted features.





Figure 10 – Digital Terrain Model of upper Lake Creek, generated from drone aerial imagery, Global Mapper and Pix4D programs. Interpreted geomorphic and anthropogenic features are shown.



Figure 11 – Digital 3D rendering of upper Lake Creek, generated from drone aerial imagery, using the Pix4D program. Interpreted geomorphic and anthropogenic features are shown.



Figure 12 - Digital Terrain Model of lower Lake Creek, generated from drone aerial imagery, Global Mapper and Pix4D programs. Interpreted geomorphic and anthropogenic features are shown.



Figure 13 - Digital 3D rendering of lower Lake Creek, generated from drone aerial imagery, using the Pix4D program. Interpreted geomorphic and anthropogenic features are shown.

## **Resistivity Surveys**

#### **Overview**

A program of resistivity geophysical surveys was conducted in September, 2020. Two lines totalling 396 metres were conducted on Lake Creek. Figure 14 shows 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, Lake Creek, September, 2020.

Lake Creek Resistivity Surveys, September 2020							
			Start Point		End Point		
Name	Claim or Lease	Length (m)	Latitude	Longitude	Latitude	Longitude	
RES20-JENAB1-02	JENABI	189	61.36368	-134.32634	61.36215	-134.32563	
RES20-LAKE1M-01	IW00735	207	61.363913	-134.32982	61.36440	-134.33330	

#### **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. Twodimensional 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 15 and 16 show the interpreted resistivity profiles from the two surveys on Lake Creek. Overall, contact resistance was low and resulting data quality was good. Bedrock was interpreted to be 12 m from surface on the longitudinal line (RES20-LAKE1M-01) and up to 16 m deep in the upstream cross-valley line (RES20-JENAB1-01). A buried boulder gravel channel was interpreted on line RES20-LAKE1M-01 at 8 m below surface, which correlates well with observations of the mining exposure on the right limit of the creek below the survey (see Plate 2, below).



Plate 2 – Right limit mine exposure on Lake Creek, photos taken in 2000 (left) and 2020 (right).

A potential gravel channel was interpreted in a bedrock depression on line RES20-JENAB1-01, at approximately 12 m below surface, and approximately 90 m from the start of the line. Bedrock appears to be relatively flat for the first 85 m of the line (starting on the right limit or north side) although the thickness of overburden steadily climbs towards the left limit.



Figure 14 – Location of the two resistivity surveys conducted on Lake Creek in September, 2020.



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Figure 15 – Resistivity survey line RES20-LAKE1M-01 was conducted from upstream to downstream above an old mining cut on the right limit of Lake Creek, on Prospecting Lease IW00735. Glacial till, boulder gravel and bedrock are interpreted in the profile with bedrock depth at approximately 12 m below surface.

Е

Ν

RES20-JENAB1-01



Figure 16 – Resistivity survey line RES20-JENAB1-01 was surveyed on the JENABI placer claim just upstream of the recent active mining cut on Lake Creek. Interpreted units in the profile include two upper boulder gravel channels, overlying a potential gravel channel at approximately 12 m below surface. Bedrock is interpreted at approximately 16 m below surface.

S



Figure 17 - Map showing interpreted features and areas of increased placer potential, Lake Creek property.

## **Conclusions and Recommendations**

The high resolution imagery obtained by the drone allowed for identification of landforms and geomorphology which would not have been possible with existing available public online satellite imagery.

Interpreted geomorphology on the orthomosiacs and the Digital Terrain Models (DTM) showed several surficial features which are not shown on the available public geology maps. These include a remnant glacial moraine, several cross-valley meltwater channels and a dissected kame terrace (glaciofluvial gravels). Although not mapped, these geomorphic features are consistent with the surficial mapping and ice-flow patterns in the drainage as previously defined by Bond and Church (2006) and Klassen and Morison (1987).

Overall, contact resistance was low in the resistivity surveys and resulting data quality was good. Bedrock was interpreted to be 12 m from surface on the longitudinal line (RES20-LAKE1M-01) and up to 16 m deep in the upstream cross-valley line (RES20-JENAB1-01). A buried boulder gravel channel was interpreted on line RES20-LAKE1M-01 at 8 m below surface, which correlates well with observations of the mining exposure on the right limit of the creek below the survey. A potential gravel channel was interpreted in a bedrock depression on line RES20-JENAB1-01, at approximately 12 m below surface, and approximately 90 m from the start of the line. Bedrock appears to be relatively flat for the first 85 m of the line (starting on the right limit or north side) although the thickness of overburden steadily climbs towards the left limit.

Areas on Lake Creek with remaining prospective placer gold potential are shown on Figure 17. This map illustrates the interpreted geomorphological features including cross-valley meltwater channels and the potential buried paleochannel on the upstream unmined left limit.

Meltwater channels may have provided areas of pre-concentration in the valley which would increase the values of placer gold in the overlying sediments. Additionally, the places where the meltwater channels transect the Lake Creek valley may be the locale for inflection points in the valley gradient, which could also correspond with increased placer gold values. These areas should be targeted in future exploration programs.

Additional cross-valley resistivity surveys are recommended upstream of RES20-JENAB1-01, in order to better delineate the orientation, depth and extent of the potential buried gravel channel on the left limit.

If possible, a drill should be brought in to confirm interpreted depths and sample the gold content of the channel. 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.

If drilling is not logistically possible, slow progress may be made progressively upstream by stripping the active mining cut face using mechanical or hydraulic means.

## Statement of Costs, September 2020 Program, Lake Creek

Table 4 - Statement of Costs, Lake Creek, September 2020 Program

Lake Creek Resistivity Surveys	Rate	Amount	Subtotal	GST	Total
<b>Resistivity Surveys, two lines including</b> <b>report</b>	\$12/line-metre	396 m	\$4752.00	\$237.60	\$4989.60
Drone Survey of Prospecting Lease IW00737, including assessment report	\$1000/creek- mile	1 mile	\$1000.00	\$50.00	\$1050.00
Total Cost					\$6039.60

## **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 2<sup>nd</sup> day of December, 2020

William LeBarge, P. Geo.

William LeBarge

## References

Bond, J.D. and Church, A. 2006. McConnell ice-flow and placer activity map, Big Salmon Range, Yukon (1:100 000 scale). Yukon Geological Survey, Open File 2006-20.

Colpron, M., 2006. Geology and mineral potential of Yukon-Tanana Terrane in the Livingstone Creek area (NTS 105E/8), south-central Yukon. In: Yukon Exploration and Geology 2005, D.S. Emond, G.D. Bradshaw, L.L. Lewis and L.H. Weston (eds.), Yukon Geological Survey, p. 93-107.

Colpron, M., 2017. Revised geological map of Livingstone Creek area (NTS 105E/8). Yukon Geological Survey, Open File 2017-1, scale 1:50000

Duk-Rodkin, A., 1999. Glacial Limits Map of Yukon Territory. Geological Survey of Canada, Open File 3694, Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Geoscience Map 1999-2, 1:1 000 000 scale.

Hughes, O.L., Campbell, R.B., Muller, J. and Wheeler, J.D., 1969. Glacial limits and flow patterns, Yukon Territory south of 65° N latitude. Geological Survey of Canada, Paper 68-34, 9 p.

Klassen, R.W., and Morison, S.R., 1987. Surficial Geology, Laberge, Yukon Territory; Geological Survey of Canada, Map 8-1985, scale 1:250 000.

LeBarge, W.P., 2007. Yukon Placer Database–Geology and mining activity of placer occurrences, Yukon Geological Survey, 2 CD-ROMs.

Levson, V., 1992. The sedimentology of Pleistocene deposits associated with placer gold bearing gravels in the Livingstone Creek area, Yukon Territory. In: Yukon Geology, Vol. 3; Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, p.99-132

Yukon Geological Survey, 2018. Digital Geology and Mineral Occurrences, available at <u>http://data.geology.gov.yk.ca</u>

Appendix A – Drone Images





61°22'0"N

134°20'0"W

**536000**°

![](_page_62_Picture_0.jpeg)

61°22'0"N

6803600

6803200

6803600

**6803200**<sup>°°</sup>

![](_page_63_Figure_0.jpeg)

61°22'0"N

**537500**° 134°18'0"W