

**2013 SOIL SAMPLING AND TEST PITTING, CAM CLAIMS**

**WHITEHORSE MINING DISTRICT**

**NTS 105 E/8**

**LARRY W. CARLYLE, P. GEO, FGAC**

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## **SUMMARY:**

This year investigation continued on the possibility that the historic placer creeks in the region may be the expression of extensional fractures between the D'Abbadie and Big Salmon Faults. Both faults are of Cretaceous Age (D'Abbadie has been dated at 96 Ma.) and have dextral displacement: D'Abbadie (approx. 35 km.); Big Salmon (approx. 57 km.) [Colpron, per. comm.].

Carlyle thought that the headwaters of the creeks would have less overburden so soil sampling should produce better metal values than previous samples taken in the creek beds where the overburden was thicker. Trench or pit sampling of the better metal values would be more easily accomplished in thinner overburden.

To investigate this theory, Carlyle spent two periods of time on the CAM Claims during the summer and fall of 2013. From June 22<sup>nd</sup> to June 27<sup>th</sup>, 50 soil samples were taken in four areas of the claim block (See 2013 CAM Claims Work Areas). From August 18<sup>th</sup> to August 24<sup>th</sup>, a test pit was hand excavated in the area of the best sample results in each of the four areas soil sampled earlier in the year (See Appendix C: Sample Area Test Pit Sketches).

## **LOCATION, ACCESS AND CLAIMS:**

The original 142 CAM Claims were staked in 1997 to cover 5 of the 6 placer creeks which make up the Livingstone placer camp. Sporadic mining is still being carried on in the camp more than 110 years after the first placer gold was discovered. The CAM Claims are located on NTS Map Sheet 105 E/8 at approximately Latitude 61° 19' N; Longitude 134° 17' W; within the Whitehorse Mining District, Yukon (See Location Map, pg. 3).

Poor exploration sample assays between 1998 and 2000 resulted in more than 50 claims north of Cottoneva Creek being let lapse in the spring of 2005. During the summer of 2005, 65 full and fractional claims were staked adjoining the east and southeast edge of the original CAM Claims. Subsequently, several of these claims have also been let lapse. The claim group presently consists of 80 CAM Claims; 76 in good standing until May 16, 2014 and 4 claims in good standing until May 19, 2014. These claims have been maintained to cover areas in the Lake Creek area and at an old adit site on the north side of Livingstone Creek where samples have given the best assay values.

A 75-mile winter road from Lake Laberge, just north of Whitehorse, provides access to the Livingstone Creek area. The Livingstone area has several airstrips so access is usually via fixed-wing aircraft from Whitehorse; approximately 50 air miles (80 kilometres) to the south-southwest. The main Livingstone airstrip is 4000 feet (1220 metres) long and has had DC-3 and Caribou aircraft landed on it. The extensive placer mining in the area has resulted in the presence of cat trails up most of the creeks within the claim block. These trails have become heavily overgrown since 2000, but still offer fairly good access to many areas with all-terrain vehicles.

The claims cover areas extending from the fault escarpment near the eastern edge of the Big Salmon Fault at an elevation of approximately 900 metres (2,950 ft.) to the top of the hills above the headwaters of the creeks at an elevation of approximately 1500 metres (4,920 ft.). The claims are located on rounded to steeply sloping hills; the creek canyons have the steepest slopes. Vegetation consists of black spruce, pine, willow and buck brush.

**Claim Information:**

<u>Claim Name</u>	<u>Grant Numbers</u>	<u>Expiry Date</u>
CAM 1 – 26	YB 97530 – YB 97555	May 16, 2016
CAM 51 -- 86	YB 97580 – YB 97615	May 16, 2016
CAM 143 – 146	YC 08748 – YC 08751	May 19, 2016
CAM 157 – 159	YC 40019 – YC 40021	May 16, 2016
CAM 161	YC 40023	May 16, 2016
CAM 163	YC 40025	May 16, 2016
CAM 172 – 180	YC 40034 – YC 40042	May 16, 2016

**PLACER GOLD:**

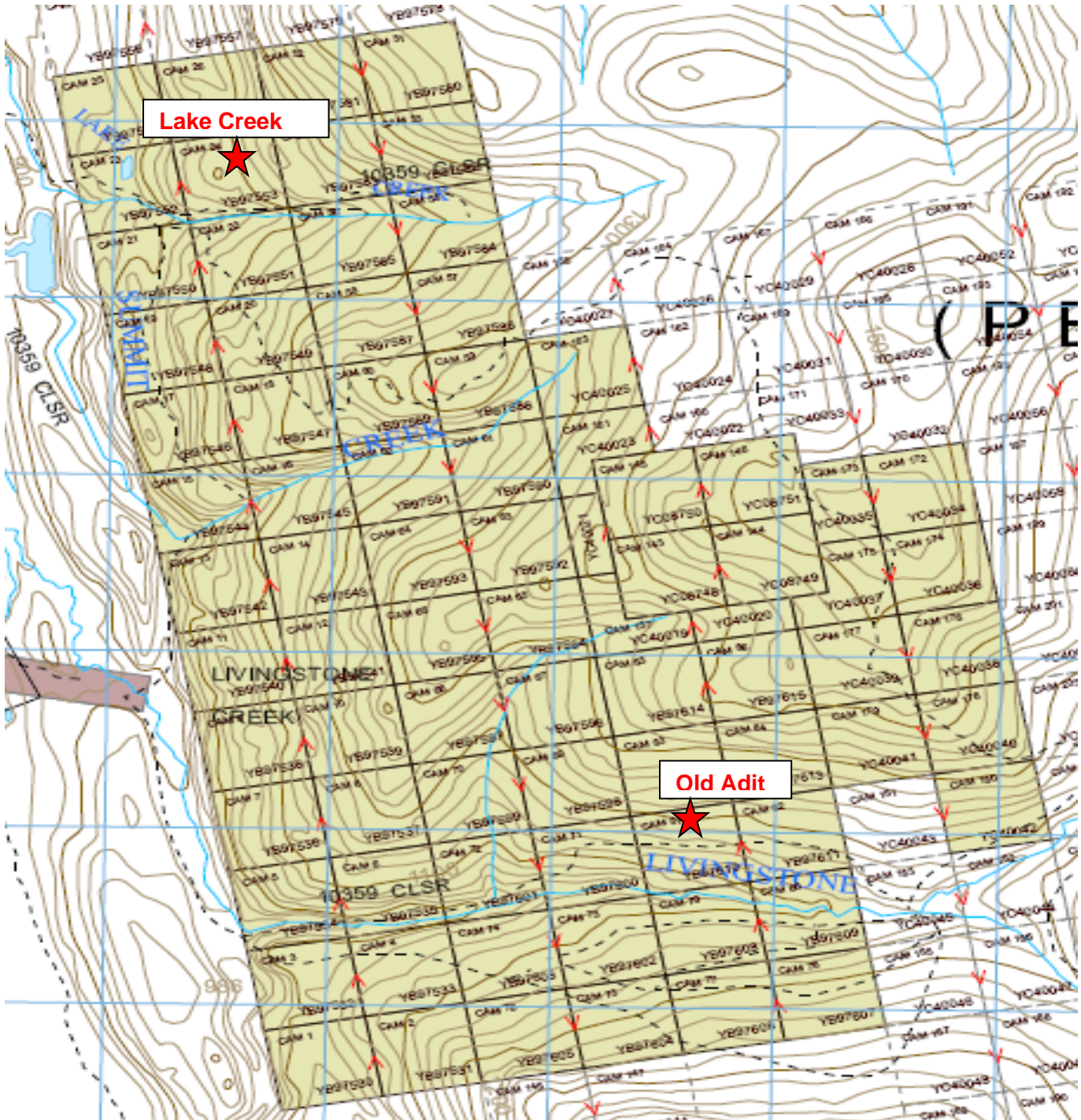
Much of the recovered gold consists of large, rough nuggets. Many of the nuggets are encased or attached to quartz and other country rock. The gold was originally thought to have eroded primarily from quartz veins and stringers striking parallel to the Big Salmon Fault and perpendicular to the flow of the creeks. If Dr. Colpron's theory is correct, the gold may be coming from mineralized fractures parallel to or in the creeks. In fact, a well mineralized boudin having this strike has been located near the old adit and has been exposed for approximately 15 metres.

Placer gold has a high purity of 860 – 895 fineness. The amount of gold recovered from the Livingstone creeks is presently reported as 50,000 troy ounces. This production seems to represent gold recovered and reported since the 1930's. Carlyle has been provided with a 1974 report by Gordon Bennett which gives partial information on the gold produced by the "old-timers" between 1899 and 1930; this information indicates production approximating 50,000 ounces. When reported production between 1930 and 2000 is added, placer gold production is estimated to be closer to 100,000 troy ounces (Appendix D: 2011 Carlyle Assessment Report).

The gold was eroded from the country rock during the long erosional period between the Reid (approx. 200,000 years before present) and McConnell (approx. 20,000 years before present) glaciations. McConnell glaciers moved over the area from the south southeast, preserving the placer gold by covering the creeks with variable thicknesses of till.



Map 1. Property Location Map



**Part of Claim Map NTS 105 E/8  
Showing Livingstone Area CAM Claims**  
SCALE: 3.6 cm. = 1,000 metres

## **REGIONAL GEOLOGY:**

McConnell first described the geology and the placer gold deposits of the Livingstone Creek area in 1901. Cockfield, Lees, and Bostock carried out regional geological mapping between 1929 and 1934. This work resulted in Map 372 A being issued in 1936.

The regional geology was reinterpreted by Tempelman-Kluit in 1977 – 1979. This interpretation identified the Big Salmon Fault, into which the placer creeks drain. He also identified the Teslin Fault (4 -- 6 miles west of the Livingstone camp) as the ancient western margin of North America. Tempelman-Kluit postulated that the rocks west of the Teslin Fault (also known as the Teslin Suture) were pressed against and over the original North America during the Early Cretaceous.

Several geologists such as R.A. Stevens; P. Erdmer; R.A. Creaser; C.S. Gallagher; and M. de Keijzer have reinterpreted Tempelman-Kluit's work since the mid-1980's. Dr. Maurice Colpron of the Yukon Geological Survey started geological mapping in the Livingstone area in 2004 and completed it in 2005. His mapping has significantly modified the geological understanding of the region and is probably the most relevant interpretation to the CAM Claims (See Colpron Map, 2005; pg. 7).

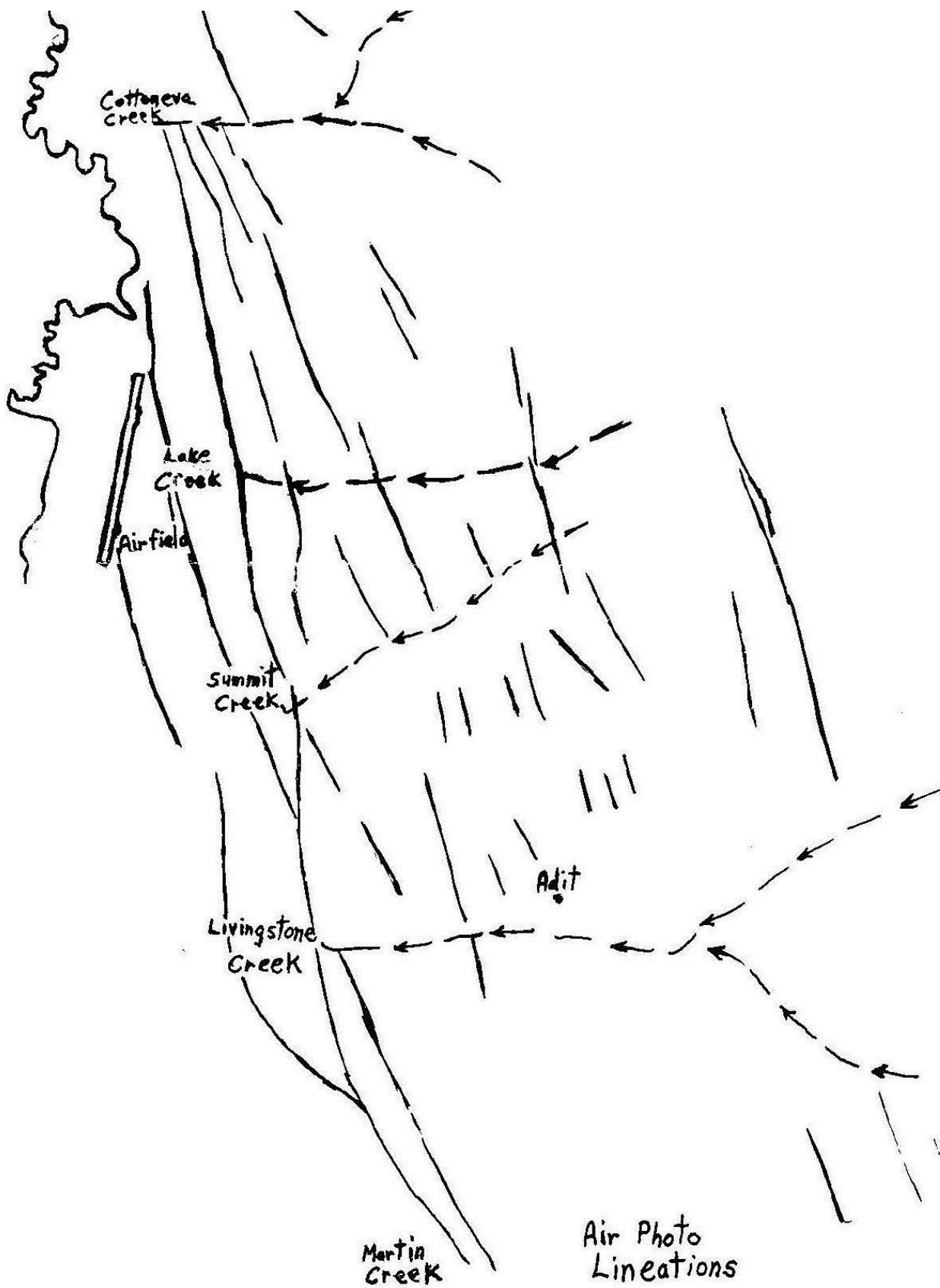
## **PROPERTY GEOLOGY:**

An Early Mississippian tonalite-granodiorite intrusive dips westerly under the calcareous and graphitic metasediments which Colpron includes as part of the Snowcap Complex of Lower Mississippian or older age. The Snowcap Complex is part of the Yukon-Tanana Terrane.

The intrusive – metasediments contact extends along the headwaters of all six creeks which have produced placer gold. This is a similar situation to that described by Dr. Victor Wall in his Thermal Aureole Gold (TAG) model. In Dr. Wall's model, the gold was emplaced in the quartz veins within the calcareous and graphitic metasediments from the underlying intrusive. The gold is believed to have been remobilized and concentrated within faults paralleling the Big Salmon Fault which has an age of approximately 100 Ma. (See Tracings of Air Photo Lineations; pg. 6). Carlyle had been using this TAG model for his exploration until the 2010 year's work program.

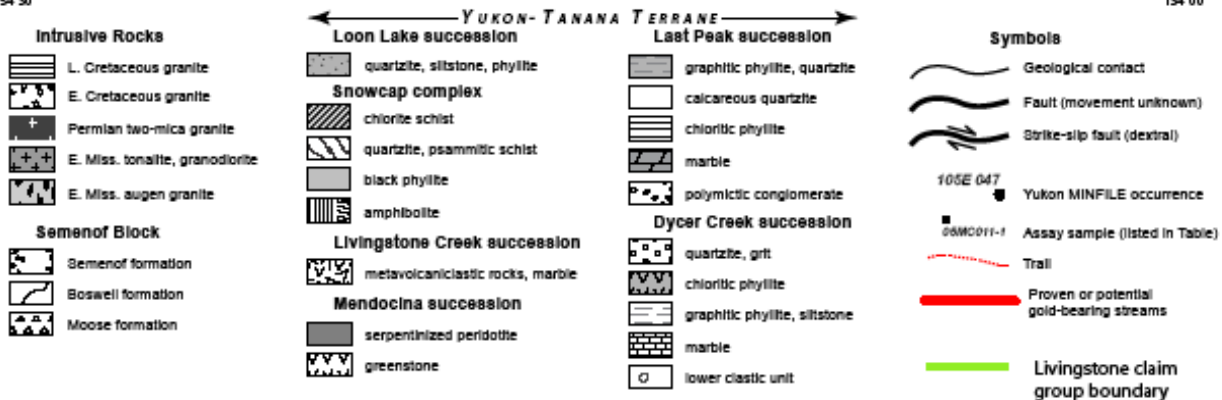
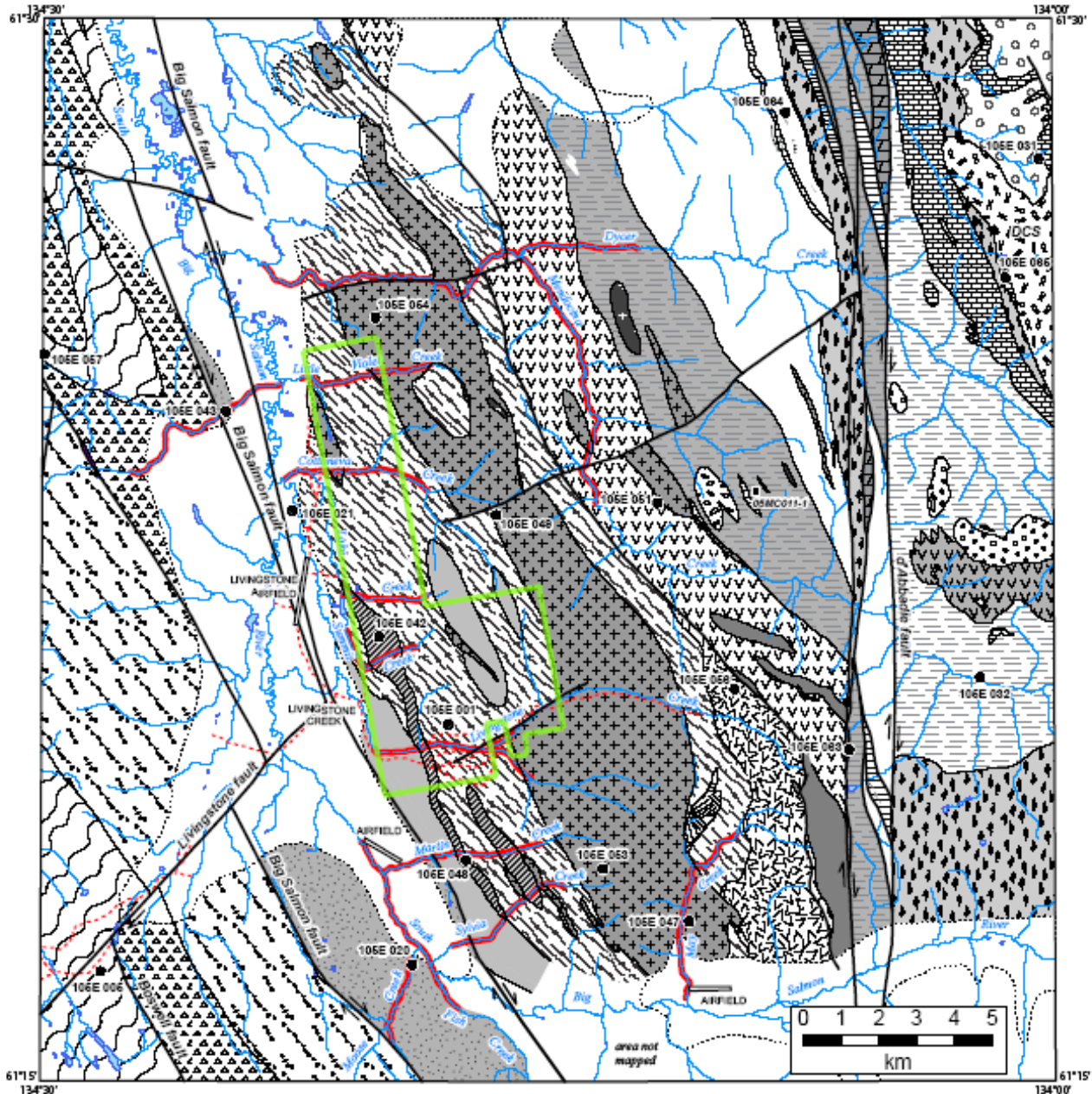
After many years of unsuccessful work trying to find mineralization along the north-south faults, Carlyle has come to believe that the mineralization was more likely emplaced during Cretaceous time in extensional faults created by activity between the Big Salmon and D'Abbadie Faults as suggested by Dr. Colpron.





Air Photo  
Lineations

Not to Scale



From 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.

## **WORK PROGRAM:**

This year, investigation continued on the possibility that the historic placer creeks in the region may be the expression of extensional fracturing between the D'Abbadie and Big Salmon Faults. Both faults are of Cretaceous Age (D'Abbadie has been dated at 96 Ma.) and have dextral displacement: D'Abbadie (approx. 35 km.); Big Salmon (approx. 57 km.) [Colpron, per. comm.].

Carlyle thought that the headwaters of the creeks would have less overburden so soil sampling should produce better metal values than previous samples taken where the overburden was thicker. Trench or pit sampling of the better metal values is more easily accomplished in thinner overburden.

The only location on the claim block which contains fracturing having the same strike as the placer creeks is the area known locally as Sheen's Gulch. Sheen's Gulch flows into Livingstone Creek from the north just downstream of the Old Adit (See Claim Map, page 4). Soil sampling would be a follow-up on a line of soil samples taken in a similar area in 2011 (SG11 #1 – 6 on 2011 Work Areas & Inferred Faults Map).

## **SOIL SAMPLING:**

Soil samples were excavated using a shovel to a depth of 25 to 30 centimetres to get samples taken from the "C" horizon (See Typical Soil Sample Picture). Samples were taken in four areas. Samples were taken at a spacing of 20 metres across the strike of the fracture and 50 metre spacing along the strike of the fracture. The samples were taken this tightly spaced because structures expected to be found are small. Mineralized structures located on the property to the present consist of a steeply dipping vein having a width of 1 metre (Lake Creek location on Claim Map, pg. 4) and a 2 metre diameter boudin with a strike length of about 15 metres having been exposed (Old Adit location on Claim Map, pg. 4).

Sample analysis and assaying were done by ALS Canada Ltd. in Vancouver, B.C., which is ISO 9001 accredited. Soil samples are dried in ovens at 60<sup>0</sup> C (140<sup>0</sup> F) to avoid loss of volatile elements. Samples are then sieved to – 180 microns (80 mesh). A 0.5 gram sample is digested in Aqua Regia at 95<sup>0</sup> C then extremely low detection limits for 51 elements are achieved by ICP -- MS (Inductively Coupled Plasma Mass Spectrometry) and ICP -- AES (Inductively Coupled Plasma Atomic Emission Spectroscopy) analyses. Gold determinations by this method are semi-quantitative due to the small sample weight used. Rock samples are dried in ovens at 80<sup>0</sup> C (185<sup>0</sup> F); then crushed so a minimum of 70 % of the sample is under 2 mm. in size. Up to a minimum 250 gram split is then pulverized so a minimum of 85 % is under 75 microns. A 0.5 gram sample is digested in Aqua Regia then analyzed for 51 elements with ICP – MS and ICP – AES.

**SG #1 Sample Area:**

Twelve samples, labelled SG13 – 1 to SG13 – 12, were taken in three lines of four samples on claim CAM 144; YC08749 (See Appendix B: Contoured Sample Assay Sketches). This site was chosen because the samples cross the gully of a seasonal creek at the head of Sheen's Gulch and having a strike similar to that of the main creeks. This area had been identified as a potential area of interest during Carlyle's work on the property in 2011. Samples SG11 #1 – 6 on the 2011 Work Areas & Inferred Faults Map were taken at 50 metre spacing across part of the cirque at the top of Sheen's Gulch.

**SG #2 Sample Area:**

Twelve samples, labelled SG13 – 13 to SG13 – 24, were taken in three lines of four samples on claim CAM 174; YC40036 (See Appendix B: Contoured Sample Assay Sketches). This site was chosen because it lies approximately 850 metres east and directly along the strike of a slight ridge from sample area SG #1.

**SG #3 Sample Area:**

Twelve samples, labelled SG13 – 25 to SG13 – 36, were taken in two lines of six samples on claim CAM 143; YC08748 (See Appendix B: Contoured Sample Assay Sketches). This sample site was chosen because it was along the northern edge of a possible Cretaceous fault running up Sheen's Gulch and at the intersection of a lineation considered to have the same early Mississippian age as the tonalite-granodiorite intrusive to the east. It is believed that such sites may have mineralization concentrations due to mineralized Cretaceous fluids flowing into the pre-existing faults along the lineations. (See Lineation Sketch, pg. 6)

**RT Sample Area:**

Fourteen samples, labelled RT13 – 1 to RT13 – 14, were taken in two lines of five samples and one line of four samples on claim CAM 146; YC08751 (See Appendix B: Contoured Sample Assay Sketches). This sample site was chosen because it was along the southern edge of a possible Cretaceous fault running up Summit Creek and at the intersection of a lineation considered to have the same early Mississippian age as the tonalite-granodiorite intrusive to the east. It is believed that such sites may have mineralization concentrations due to mineralized Cretaceous fluids flowing into the pre-existing faults along the lineations. (See Lineation Sketch, pg. 6) This area was also close to a trench excavated in 2000 called Ron Trench. Ron Trench exposed a small, discontinuous, very weakly mineralized quartz vein having a strike parallel to Summit Creek.

## **TEST PITTING:**

### **SG #1 Sample Area Test Pit [SG13 – 1(P)]:**

A test pit approximately 1.2 metre by 1.2 metre was excavated at the location of Sample SG13 – 1. Pit is approximately 1 metre deep. Material collected from the pit is primarily sericite schist and moist gravel. Some minor graphitic schist and amphibolite gneiss. Some trace muscovite, quartz and limonite. See Sample Area Test Pit Picture and Appendix C: Test Pitting Area Sketches for assay values.

### **SG #2 Sample Area Test Pit [SG13 – 14(P)]:**

A test pit approximately 1.2 metre by 1.2 metre was excavated at the location of Sample SG13 – 14. Pit is approximately 1 metre deep and a small distance south of the soil sample site. The pit was dug at this location because of the presence of large boulders at the sample site. Material collected from the pit was primarily sericite schist and moist gravel. Minor amounts of graphitic schist and amphibolite gneiss. Most striking feature was euhedral muscovite in quartz. See Sample Area Test Pit Picture and Appendix C: Test Pitting Area Sketches for assay values.

### **SG #3 Sample Area Test Pit [SG13 – 29(P)]:**

A test pit approximately 1.2 metre by 1.2 metre was excavated at the location of Sample SG13 – 29. Excavation at this site hit bedrock at approximately 0.75 metre depth. The best assay results had been obtained at Sample SG13 – 34, but this site was too swampy and wet. Material collected from the pit was primarily graphitic schist and dry gravel. Some minor amphibolite gneiss boulders with minor bull quartz containing limonite fracture fillings and trace pyrite crystals. See Sample Area Test Pit Picture and Appendix C: Test Pitting Area Sketches for assay values.

### **RT Sample Area Test Pit [RT13 – 13(P)]:**

A test pit approximately 1.2 metre by 1.2 metre was excavated at the location of Sample RT13 – 13. Pit is approximately 1 metre deep. Material collected from the pit was primarily a mixture of sericite schist, graphitic schist, and amphibolite gneiss in wet gravel. See Sample Area Test Pit Picture and Appendix C: Test Pitting Area Sketches for assay values.

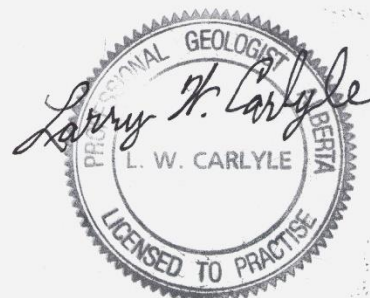


## CONCLUSIONS:

1. The anticipated improved assay grades expected from soil samples taken in areas of shallower overburden were not achieved. If anything, gold assays were generally lower than those obtained from soil samples taken previously in areas with thicker overburden. This may have been due to the gold determinations by the analysis method making them semi-quantitative due to the small sample weight used. It may be beneficial to use an analysis technique which may analyze for fewer elements by using a larger sample weight.
2. The correlation of higher gold grades with higher copper grades was maintained. Weak correlations between the higher copper and gold assay grades and slightly higher mercury, lead and zinc soil sample grades was determined. Assay grades for arsenic and antimony continue to be erratic with no evident correlations. See Appendices B and C: Selected Soil Sample and Pit Sample Element Values.
3. Following up on good soil sample results by excavating to bedrock in areas of shallow overburden has proven successful in the area of the Old Adit (See Claim Map, page 4). Performing excavations with hand tools is too time consuming and difficult; using small Kubota-type excavators for future excavations would be more efficient.

## RECOMMENDATIONS:

1. Investigation of the source of the mineralization known to exist in the Livingstone area must continue. Is it in the lineations (See Diagram, page 6) as originally thought? Is it in extensional faults along the creeks as suggested by Dr. Colpron? Is it concentrated at intersections of extensional faults with the pre-existing lineations? Is it in some other location?
2. Multi-element assaying of samples should continue. Such assaying should include gold and mercury analyses in parts per billion. A gold analysis technique which avoids their being semi-quantitative due to the small sample weight should be used in future analyses.
3. Use of small excavators to test soil sample anomalies is much preferred to using hand tools.

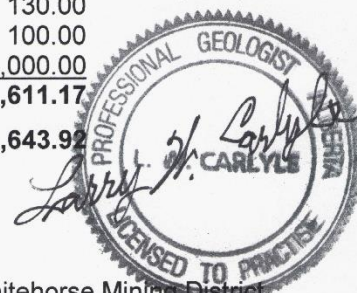


**STATEMENT OF COSTS:****June 22 – 27, 2013 Trip**

Helicopter Rental (Heli - Dynamics Ltd.)	\$ 1,848.38
Sample Analysis [ALS Minerals] (WH13120360)	\$ 1,668.18
Geologist wages [June 22 – 27/13 (6 days @ \$300/day)]	\$ 1,800.00
Room & Board (6 days @ \$102.70/day [2013 YG Rate])	\$ 616.20
Purchase of 1 year activation for Gstar SPOT	\$ 99.99
<b>Sub Total</b>	<b>\$ 6,032.75</b>

**August 18 – 24, 2013 Trip**

Helicopter Rental [Heli Dynamics Ltd.] (August 18 <sup>th</sup> )	\$ 3,777.48
Helicopter Rental [Heli Dynamics Ltd.] (August 24 <sup>th</sup> )	\$ 3,777.78
ATV Rental (Lister's Rentals)	\$ 840.00
Sample Analysis [ALS Minerals] (WH13155454)	\$ 167.31
Geologist wages [Aug. 18 – 24/13 (7 days @ \$300/day)]	\$ 2,100.00
Room & Board (7 days @ \$102.70/day [2013 YG Rate])	\$ 718.90
Field Supplies (flagging, samples bags, stove fuel, ATV fuel, etc.)	\$ 130.00
Office Supplies (computer, toner, paper, memory sticks, etc.)	\$ 100.00
Report Writing	\$ 2,000.00
<b>Sub Total</b>	<b>\$13,611.17</b>
<b>Grand Total</b>	<b>\$19,643.92</b>

**REFERENCES:**

Carlyle, Larry W., (2011) **2011 Work Program, CAM Claims, Livingstone Area**; Whitehorse Mining District, Yukon; NTS 105 E/8. Assessment Report filed with the Whitehorse Mining Recorder

Carlyle, Larry W., (2010) **2010 Work Program, CAM Claims, Livingstone Area**; Whitehorse Mining District, Yukon; NTS 105 E/8. Assessment Report filed with the Whitehorse Mining Recorder

Carlyle, Larry W. (2007) **2007 Assessment Work; CAM Claims, Livingstone Area**; Whitehorse Mining District, Yukon; NTS 105 E/8. Assessment Report filed with the Whitehorse Mining Recorder

Colpron, M., (2006) **Geology and mineral potential of Yukon-Tanana Terrane in the Livingstone Creek area (NTS 105 E.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, pg. 93 – 107

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Colpron, M., (2005) **Geological Map of Livingstone Creek area (105 E/8), Yukon (1:50,000 scale)**; Open File 2005 – 9: Yukon Geological Survey, Energy, Mines and Resources: Government of Yukon

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Carlyle, Larry W. (1999) **Bedrock Geology, VLF-EM Surveying, Rock, Soil and Stream Sediment Sampling, 1999; CAM Claims 1 – 146, Livingstone Area**; Whitehorse Mining District, Yukon; NTS 105 E/8. Assessment Report filed with the Whitehorse Mining Recorder

Carlyle, Larry W. (1998) **Report on the 1998 Work Program, CAM Claims 1 – 146, Livingstone Area**; Whitehorse Mining District, Yukon; NTS 105 E/8. Assessment Report filed with the Whitehorse Mining Recorder

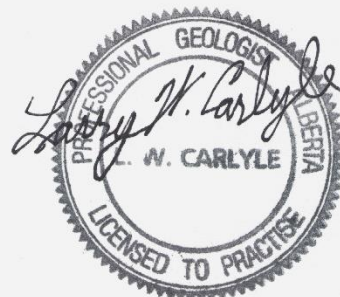
Carlyle, Larry W. (1997) **Report on the 1997 Work Program, CAM Claims 1 – 142**; Whitehorse Mining District, Yukon; NTS 105 E/8. Assessment Report filed with the Whitehorse Mining Recorder

### STATEMENT OF QUALIFICATIONS:

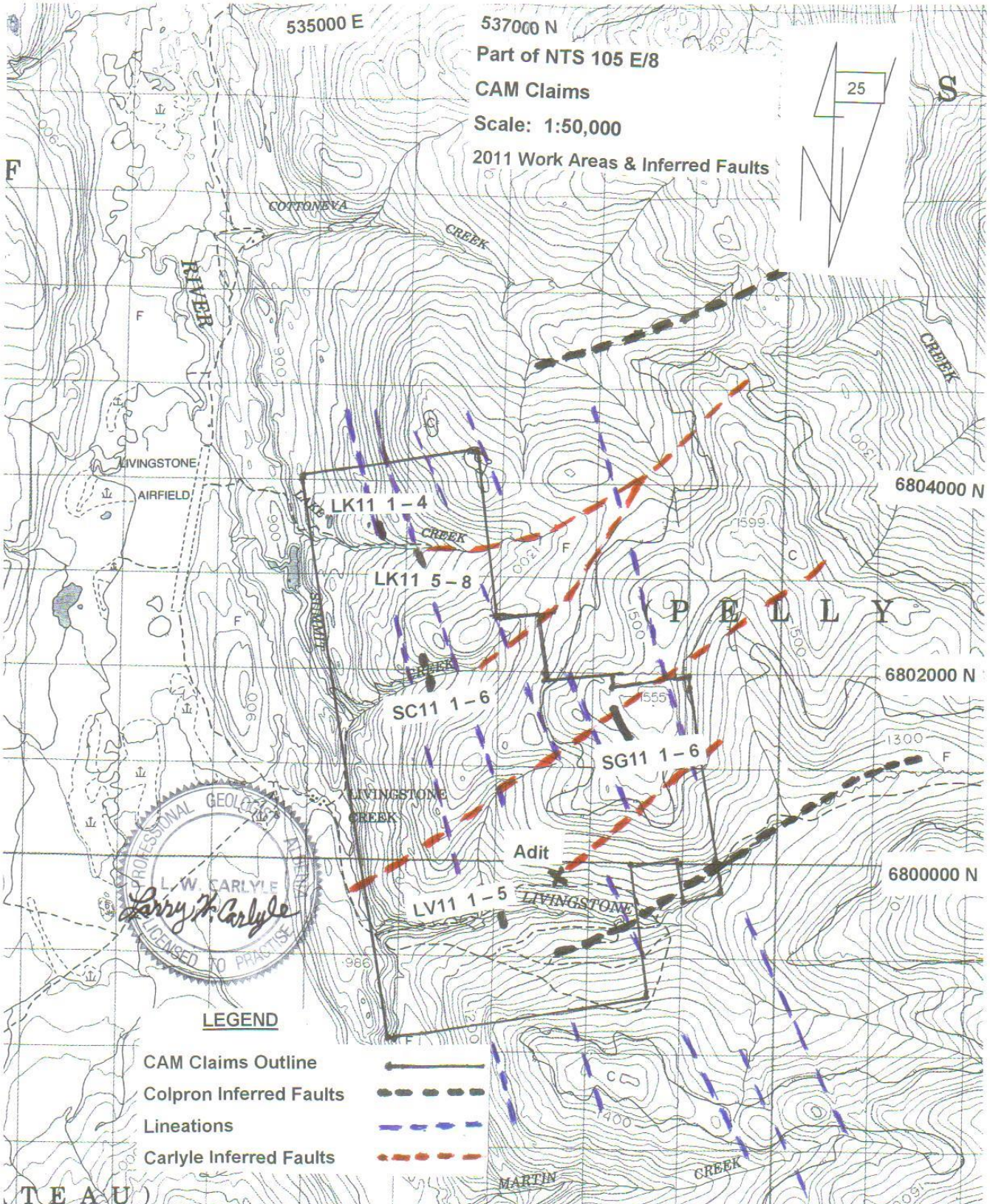
I, **LARRY W. CARLYLE**, do certify:

1. That I am a professional geologist, resident at #2 Soapberry Lane; Whitehorse, Yukon Y1A 5W5.
2. That I hold a B. Sc. degree in geology from the University of British Columbia (1970).
3. That I am a registered Professional Geologist in the Association of Professional Engineers, Geologists and Geophysicists of the Province of Alberta (41097).
4. That I am a Fellow of the Geological Association of Canada (F – 4355).
5. That I have practiced my profession as a mine and exploration geologist for over twenty years.
6. That the conclusions and recommendations in the attached report are based on work I performed on the property and on a review of the references cited.

DATED at Whitehorse, Yukon this *14<sup>th</sup>* day of *May, 2014*





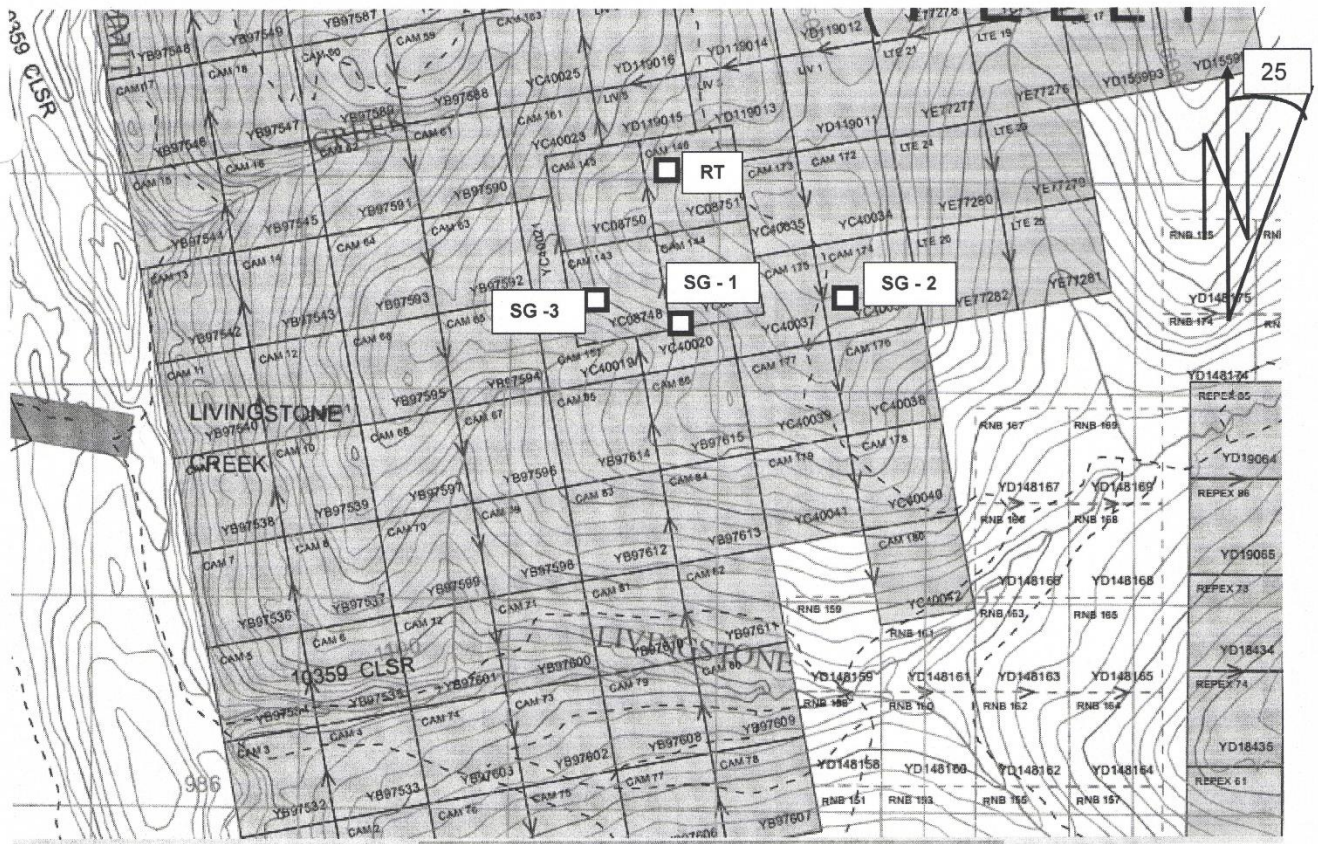


	As (ppm)	Au (ppb)	Cu (ppm)	Pb (ppm)	Sb (ppm)	Zn (ppm)	<u>Northing</u>	<u>Easting</u>
SG11 - 1	3.9	3.5	11.7	4.1	0.2	25.0	6802076	0536237
SG11 - 2	7.5	1.8	13.1	6.7	0.3	49.0	6802078	0536239
SG11 - 3	23.3	5.2	24.8	9.0	1.4	49.0	6802100	0536242
SG11 - 4	19.3	13.2	18.2	10.6	0.9	54.0	6802119	0536245
SG11 - 5	26.4	5.0	28.8	11.8	1.1	70.0	6802123	0536247
SG11 - 6	15.1	37.4	34.0	11.9	1.0	96.0	6802128	0536252

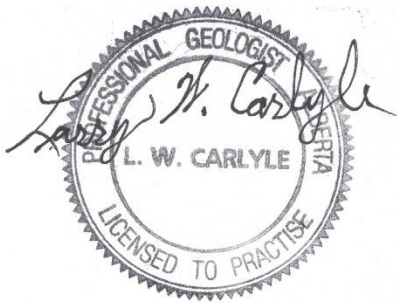








**2013 SOIL SAMPLE AREAS**  
 Scale: 3.2 cm. = 1000 metres





**2013 Camp Site**



**Typical Soil Sample Site**





**SG13 – 1(P)**



**SG13 – 14(P)**



**RT13 – 13(P)**

**SG13 – 29(P)**