Placer gold exploration in the

Yukon Territory

TARGET EVALUATION CAMPAIGN AT BELL CREEK

(Map 115P14p)

August-September 2014

by Sandro Frizzi, geologist and prospector

Introduction

During the summer of 2014, between August and September, we explored and tested for placer gold in the alluvial deposition of Bell Creek.

Bell Creek is one of the right tributaries of the Left Fork, on upper Clear Creek.

It's located in an area historically known for being a great producer of placer gold: between 1942 and 1952 Canadian Placers Ltd. (renamed Clear Creek Placers Ltd.) recovered 30,000 ounces of raw gold by dredging just a section of the left fork (from the mouth of Barney Pup to the mouth of Lewis gulch).

Later, thousands of ounces have been mined by smaller enterprises from stretches of virgin ground left behind by the dredging company.

Today the area is still going: Harpers mine keeps producing gold after forty years of activity on the upper part of Clear Creek, 7-8 km upstream from the mouth of Bell Creek.

65 Pup is another right tributary, located at 1.5 km downstream from Bell Creek and almost parallel to it. It became well known for the good amount (and the big size) of gold recovered in the proximity of its mouth and along the valley.

Surprisingly, Bell Creek and the rest of the upper right tributaries of the Left Clear Creek have been neglected for decades and those areas are nowadays underexplored.

During 2012 and 2013, we decide to invest our time and resources in a prospecting campaign along the basin of Bell Creek.

Trough preliminary inspection we found the remains of a certain number of test pits dug in different periods by hand, by dozer and, in more recent times, by excavator. The latest work done probably dates back to the beginning of the 90s. We couldn't obtain

reports about these past testing campaigns: just few information coming from the older miners, saying that "the ground wasn't rich enough for that time".

Bell Creek was tested when the gold price was at its lower peak.

This factor convinced us to dedicate an extended bulk sampling campaign to this intriguing area, hoping to find something that our predecessors had failed to recover.

During our preliminary explorations we also noticed the presence of well rounded quartz boulders, scattered along the river bed, some of those measuring almost 1 meter.

Over the winter 2013-2014, we planned a target evaluation campaign to perform along the entire Bell Creek valley. We chose the areas to test by working on satellite images and by comparing several field observations.

The first week of August 2014 our crew, after restoring the old access road, drove in with medium-size mining equipment (an excavator Komatsu PC 138, a wash plant of 5 m3/hr, and two sets of water pumps). We established camp by the mouth of the creek.

The exploration started immediately with digging and sampling along the valley and processing the gravel right above the bedrock. We tried several time to test the left stretches of older upper benches without success: a thick layer of extremely hard permafrost didn't allow our 14 tons excavator to dig into the ice (still, we managed to scrap the muck for few inches, in order to prepare the ground for a second attempt that will be performed during the next summer of 2015).

Along the valley, the bulk sampling campaign produced extremely poor results: since the first tested pit, after washing few cubic meters of gravel and bedrock (roughly 15 m^3), the gold extracted weight less than 1 gram, and is represented just by fine and ultrafine specs. We obtained similar result from each one of the sampled holes: nothing significant has been recovered: just tiny, barely visible specs (a bit better at hole 6 but still pathetic).

Under the microscope the gold appears to be extremely beat up and flattened. It closely resembles the grinded specimens of glaciofluvial origin, recovered in the sandbars of the McQuesten and Stewart River.

During the testing, we began to discover traces of a past, energetic glacial activity occurred along this valley: the round quartz boulders, partially responsible for exciting our initial expectations, started to reveal different origins.

The surficial geology showed us that these big boulders weren't part of an old fluvial deposition, possibly rolled down the valley from upper benches: in fact they lie here and there, scattered at different depth and mixed with angular and sub-angular rocks,

much softer (slates, phyllite and quartzite). To confirm our doubts, we also noticed in our pits the existence of a glaciofluvial type of deposition underlying a very thin layer of alluvium. The fluvial deposition exposed in the pits is thin (30-70cm) and fairly young, formed by a variety of pebbles and cobbles (5-40cm).

After digging and processing the material at pit number 7 and 9, we decided to suspend the bulk sampling campaign and to find the origin of this glacial event that seems have affected Bell Creek Valley.

We started to follow and to record the distribution of the quartz boulders, and to represent them distribution on the map; we searched along the main valley and up the tributaries. To our eyes it soon became evident that these boulders are mostly coming from the left side of the watershed: from the South Little Kondike Valley.

Are they part of a lateral moraine which overflowed from the basin of the South Little Klondike through the lower points of the watershed? The distribution on the map supports this theory. The size and the quantity of the boulders are also witnessing the evidence of an energetic event, certainly followed by substantial flows of water.

If our observations are correct, the dimensions of these events could have been powerful enough to explain the disappearance of the original alluvium of Bell Creek. The stretches of ancient/upper benches noticeable along the valley seem to support this interpretation.

The modern Bell Creek is today an 'immature' deposition, probably too young to host economical concentrations of gold in an area where the geology shows a very low grade of primary gold deposition in the surrounding mountains.

After completing these observations, in spite of the poor results obtained, we decided to give Bell Creek a last chance: during the summer of 2015 we will come back to quickly test the remains of the ancient/upper benches (we already stripped the surface to allow the permafrost to melt).

If these benches will show the same scarcity of gold recorded along the valley, we will let our prospecting lease lapse.

Sandro Frizzi

Location of Bell Creek

Bell Creek is visible on **Map 115P14p**. It's a tributary of Clear Creek (it flows into the right bank of Clear Creek, 6 km upstream the left fork).

This creek is located in the central part of the Yukon, between Mayo (located 76km toward south-east) and Dawson City (located 105km toward north-west).

It runs in from NW toward SE, and it borders with the watershed of 65 Pup toward south, and the watershed of South Little Klondike toward north.

Bell Creek is accessible by road. From Dawson City it's necessary to drive south on the Klondike highway until the junction with Clear Creek road (110 km), then follow the Clear Creek road until the mouth of Bell Creek (36 km). From here starts an old road that runs along the right side of Bell Creek valley. The road has been abandoned for decades and, even though we repaired it, still remains in ruff condition.

The distance between Bell Creek and Whitehorse is roughly 500 km.

In case of emergency, there is an airstrip at 7km upstream Clear Creek, right before the mine of Mr. Harper. Any helicopter will be able to perform an easy landing right at the mouth of Bell Creek, along the Clear Creek road.

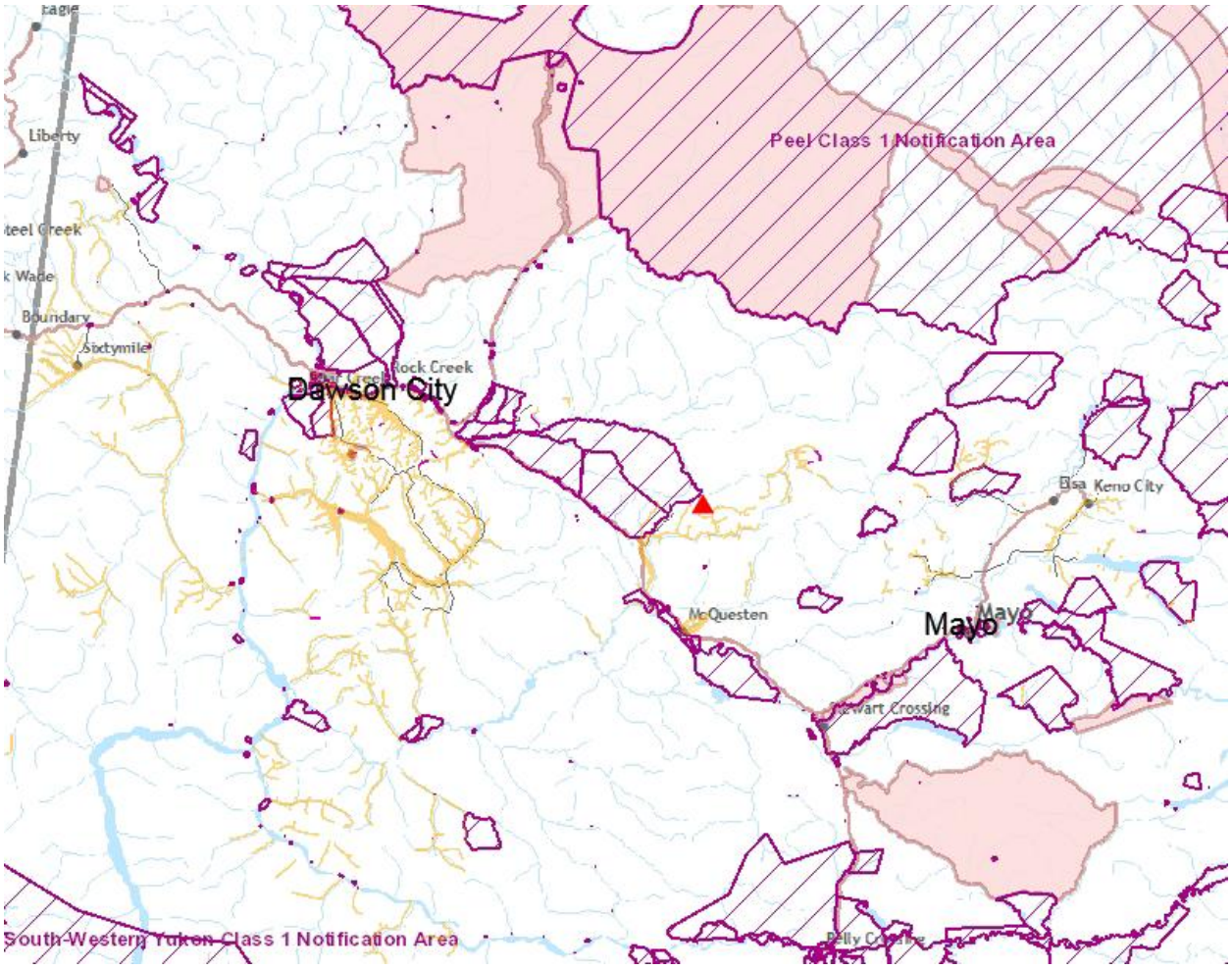
Bell Creek

Bell Creek on map

(red triangle)

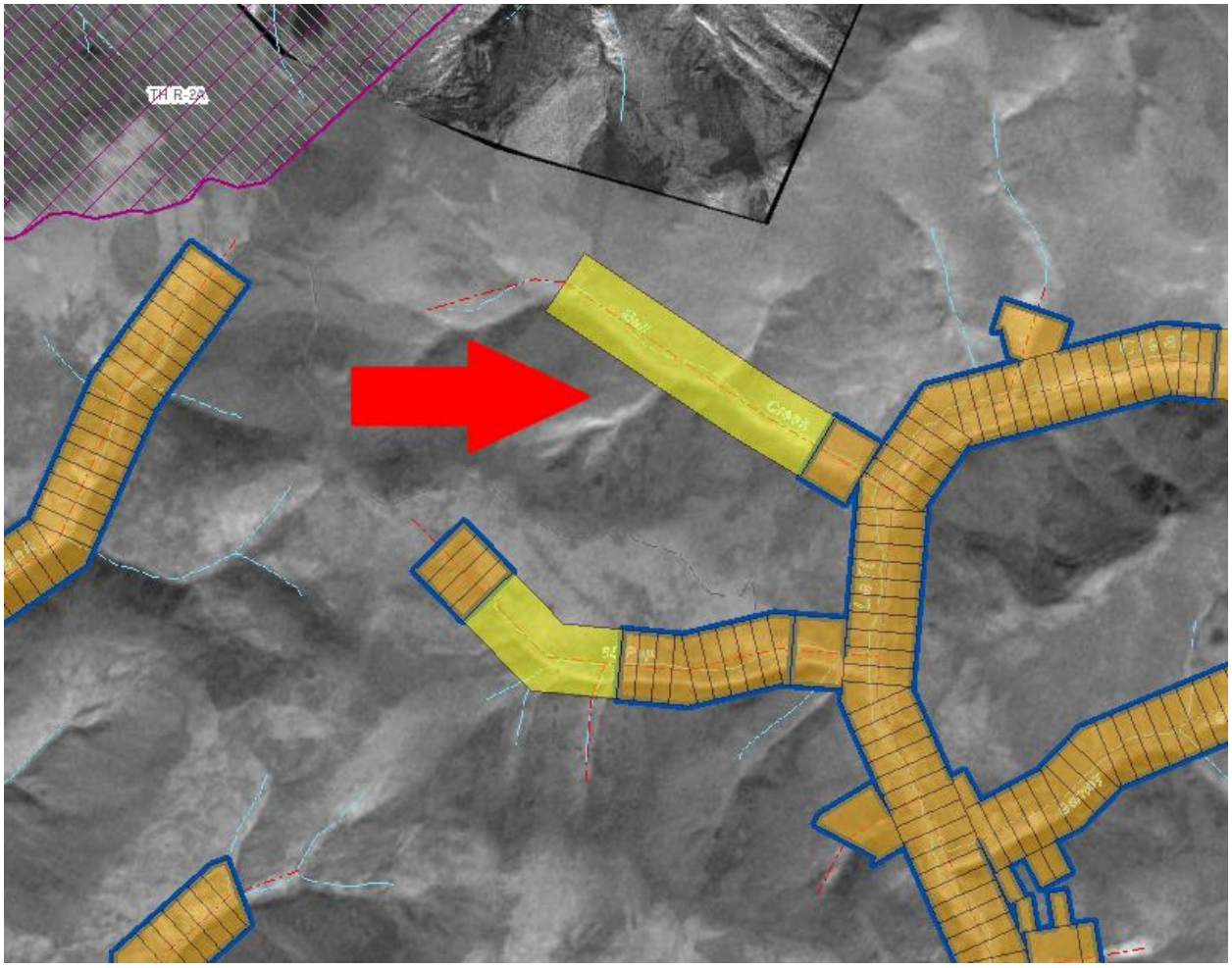
scale 1:1,500,000

North Δ



Our prospecting lease (2 mile)

scale 1:50,000.



Workers at Bell Creek

Here is the list of all those who have contributed to the target evaluation campaign at Bell Creek:

- **Max Mikhaylitchev**, staker, prospector, operator, handy man from Vancouver. Probably the strongest young man to hire for extreme expeditions in the wilderness. Max staked the first lease and did some prospecting in the area.

- **Bruce McArthur**, businessman and farmer from Trochu, Alberta. Bruce is an excellent operator, a truck driver and an expert of heavy duty equipment. He worked at Bell Creek and at Big Creek. He's the right man to put on an excavator when the ground is particularly rough.

- **Joerg Lotz**, civil engineer from Germany. Since the last 3 years Joerg is approaching the placer gold mining industry with excellent results, thanks to his skill and his knowledge of the behavior of rivers and creeks.

- **Rocco Frizzi**, goldsmith from Italy. He's the brother of Sandro and he came in Yukon to live an adventurous summer vacation. Rocco spent several days at camp with us, helping and cooking some great meal.

- **Sandro Frizzi**, geologist and prospector from Dawson City with years of experience in many remote areas of the Yukon. Sandro organized and conducted this testing campaign.

From left: Joerg, Sandro and Bruce

Equipment

Here is a list of equipment used at Bell Creek:

- Excavator on tracks Komatsu PC 138. This is a 14 tons piece of equipment with a strong engine and the possibility to dig up to 5.5m of depth. We used ½ yard digging bucket. The law in Yukon doesn't allow using excavators bigger than 20 tons for exploration. This is a great machine with low ground-pressure and a lot of power.

- Wash plant for 3-5 m^3/hr. A solid high banker with a foldable heavy-duty grizzly with 5 cm of pre-screen, 0.5 cm of second screen and 6 ft of sluice with different sets of riffles and miner moss on the bottom. This wash plant works well with a 2" water pump.

- Two 4x4 trucks (GMS Sierra 3500 and Ford 350) with trailers for the gears, ATV and fuel barrels. One big heavy duty truck to transport equipment: Volvo, 18 wheels, with low-bed heavy duty trailer.

- Two ATV (Honda Fourtrax 350 and Kodiak diesel 700).

- Two water pumps Honda 2", 1 Honda 3000 generator, 2 chainsaws, 2 GPS, compasses, laptops, mechanical tools, geological tools (picks, scratchers, portable auger-drills, shovels, pans), 4 tents + a camper with kitchen, stoves, water filters, shotguns, coolers, solar chargers, radios, In Reach satellite device and satellite-phone. Plus a complete first-aid package.

equipment at Bell Creek

Test pits locations

Map 115P14.

Scale 1:20,000

North Δ


N
7
9
8
4
3
6
5
2
1
Image Landsat
Image © 2014 DigitalGlobe
118 m
2013
Google earth
Imagery Date: 4/10/2013 8 V 386204.90 m E 7081363.60 m N elev 857 m eye alt 1.40 km

UTM

		Easting	Northing
Lease ID 01190	post1	386631	7080963
	post2	384413	7082189
Pit1		386496	7081005
Pit2		386538	7081036
Pit3		386417	7081043
Pit4		386402	7081038
Pit5		386484	7081061
Pit6		386446	7081053
Pit7		385863	7081474
Pit8		385989	7081421
Pit9		385871	7081460
Camp		387344	7080547
Bench		384775	7082044
Bench		385982	7081492
Bench		386470	7081001
Old pit1		386549	7081002
Old pit2		386517	7081045
Old pit3		386192	7081194
Old pit4		385923	7081194
Old pit5		385848	7081472
Old pit6		385453	7081584
Old pit7		385064	7081839
End of quartz boulders?		384479	7084479
Max. concentration of quartz boulders		385884	7081529

Description of the pits

Pit #1: at UTM 386496-7081005.

20m x 10m x 1m (depth). Permafrost.
This is an upper bench (10m above the bottom of the valley. Under a layer of organic soil (70 cm) immediately started the permafrost: impossible to dig. We managed to scrap 40-50 cm of frozen muck to disturb the ground. We will let the ice melt for next year and we will perform a second attempt.
Note: right below the organic soil, above the frozen muck, we recovered few quartz boulders of decent size (30-60cm).

Pit #2: at UTM 386538-7081036.
7m x 6m x 5m (depth). Groundwater at -1.5m. No permafrost. Organic soil (60-80cm), layer of blackish clay-silt (<30cm), a mix of angular, subangular and rounded clasts of different size (2-30cm) and gravel in a reddish matrix of sand-silt. At -3.5m there is a layer (<50cm) of fluvial, well rounded material of different size (<30 cm), then a mix of different material (rounded and angular) again. The bedrock is composed by a 'soapy' gray-greenish phyllite.
Gold recovered: less than 1 gram from more than 15m^3 (22 tons) of processed materials. Definitely a poor catch.
Note: below a thin layer of green clay (weathered phyllite), the bedrock is extremely fractured; more gold may be recovered at bigger depth (out of range for our excavator).

Pit #3: at UTM 386417-7081043.

5m x 3m x 2m (depth). Permafrost.
This pit is located right below the same bench encountered at pit 1. We are just a hundred meters upstream. Under the organic soil (40-80cm) starts an unsorted mix of rounded and sub-angular rocks immersed in a matrix of reddish sand. We found solid permafrost at – 1.8m and that was the end of our attempt (we scraped few centimeters to expose the ice).

Pit #4: at UTM 386402-7081038.

10m x 8m x 1m (depth). Permafrost.
Upper bench above pit 3. We found the same problem encountered at pit #1: ice right below the layer of organic coverage (60cm). Once again we scraped a wide surface to allow the permafrost to melt. We will have to wait until the next season before we can start digging again. We didn't test it for gold.

Pit #5: at UTM 386484-7081061.

7m x 3.5m x 3.3m (depth). Groundwater at -2.6m. No permafrost.
Organic soil (60cm), debris-flow type (170cm), a thin black layer (20-40cm) of with small gravel and pebbles stained by manganese oxide; then a reddish sand with gravel, pebbles, angular and sub-angular unsorted clasts (5-15 cm). At -2.5m, on one side of the hole, starts the bedrock composed by schist with high content of quartz. We processed roughly 10 cubic meters of material (15 tons) and recovered a minimal amount of gold (0.5 gr). The gold is fine and ultrafine, extremely flattened.

Pit #6: at UTM 386496-7081005.

7m x 5m x 4.5m (depth). Groundwater at -1.5m. No permafrost.
This hole is located not too far from pit 5, upstream and across the creek. The stratigraphy is also similar.
The layer of the overburden measures 90cm. After that, there is a level (10-20cm) of black silt-clay, and then again an unsorted mix of rounded and sub-angular clasts of different size (from 1 to 20cm) mixed with reddish sand and silt, a lens of clay has also been recovered. The bedrock lies at -4.2m and is composed of gray schist with high content of quartz (basically a quartzite) with a sub-vertical foliation. Black, graphitic slate/phyllite has also been recovered from the bottom of this hole.
We processed 12-15m^3 of material and recovered almost 2 grams of gold (better quantity and coarser than at pit 2 and pit 5).

Pit #7: at UTM 385863-7081474.

10m x 5m x 5.5m (depth).
Groundwater at -70cm. No permafrost.
This pit has been dug at the confluence with the first left tributary (the biggest one). It's a big bench (pit 9 has been dug right beside, in a second time) excavated in an area with old traces of some kind of mining activity. Since the beginning we recovered a mix of unsorted material, mostly angular and sub-angular, with very few rounded pebbles and cobbles. There has been no change in the stratigraphy of this pit. The only remarkable note regard the discovery of few huge quartz boulders, particularly rounded, scattered at different depth, still closer to the surface (see picture). These boulders, blended with angular/softer, fan material, convinced us to suspend the bulk sampling campaign and to dedicate our attention to the history of them deposition along this valley.
At pit 7 we didn't reach the bedrock. We tested the material recovered at different levels by panning: as expected, no gold has been recovered.

Pit #8: at UTM 406361-7085803.

4m x 3m x 3.5m (depth). No permafrost
This pit is located on the left side of the valley, right before the confluence with the first tributary of Bell Creek. The intention of this pit was to cut the hillside in order to discover a potential bench, suggested by the morphology of the slope. We dug in the angular rock debris until the rock, composed by solid quartzite. The rock has been eroded by the original course of the tributary. No benches there.

Pit #9: at UTM 385871-7081460.

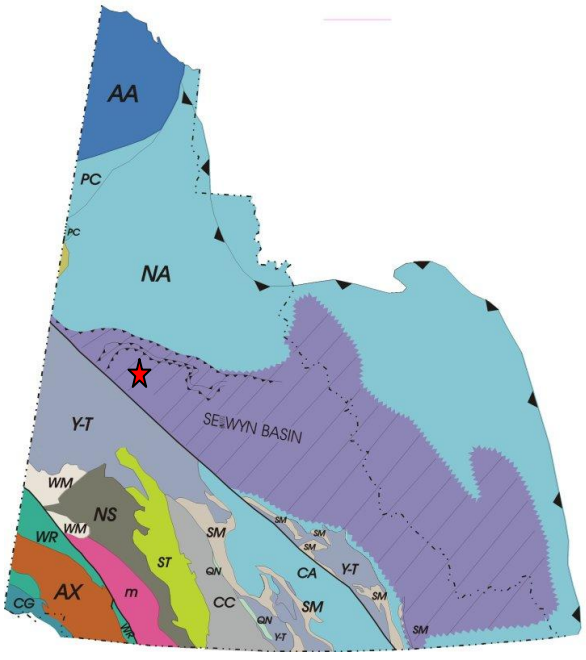
5m x 3m x 4m (depth). Groundwater at -70cm. No permafrost.
This hole is located near pit 7 and was only intended to verify the existence of more quartz boulders. We found few to confirm a big concentration of them in this area, coming from the left tributary which here is joining Bell Creek.

Bedrock geology

Bell Creek runs along the extended geological province called the “Selwyn Basin”.

Spatially, the Selwyn Basin is bound to the north by the Dawson Fault; it grades into platformal faces to east (Mackenzie Platform) and southwest (Cassiar Platform); may be bound by a Mesozoic thrust fault separating it from the Tanana Terrane in the Anvil district; and is offset to the southwest by the Tintina Fault.

The Selwyn Basin is an ancient continental margin basin (late Precambrian to Middle Devonian) characterized by the deposition of thick sequences of black carbonaceous shales. Sandstone has also been commonly deposited along this basin, in shallower water. At Bell Creek we found mostly black and grey/green phyllite, quartzite, and grit.



Bell Creek (red star)

Through the ages, several events of extensional tectonism with subsidence and faulting occurred along the basin. These events produced the deposition of different coarse clastic sediments and the beginning of a volcanic activity. Some epigenetic mineralization occurs in this environment.

Major metallogenic events in the Cordillera are Early Cambrian, Early Silurian and Middle Devonian to Middle Mississippian. Rocks of Selwyn Basin and Earn Group span

this prospective time interval and hosts deposits of these ages" (*Yukon Geological Survey 2007*).

The last extensional phase of the basin (toward NNE) resulted in a fault system with an ESE trend and subvertical dip.

The deposition of the gold from Clear Creek to the surrounding of Red Mountain (Big Creek and Josephine Creek included), is associated with these events (faulting and extensional tectonism) and particularly with the consequent uplift of intrusive bodies related with Tombstone plutonic suite, 92 millions of years ago (*see map of gold occurrence at Clear Creek, by Allen and al., 1998*).

At the headwater of Clear Creek, Big Creek and Josephine Creek, there are six Tombstone intrusions: the Saddle, Eiger, Pukelman, Rhosgobel, Josephine and Big Creek stocks. They have a surface exposure ranging from 0.2 to 3.5km and they all contain gold (*Marsh Allen and Hart, 1998*).

The Saddle, Pukelman and Rhosgobel stocks are composed of medium- to coarse-grained quartz monzonite with large alkali feldspar phenocrysts.

The Josephine and Big Creek stocks are composed of fine- to medium-grained equigranular granodiorite. The Eiger stock is composed of fine-to medium-grained equigranular diorite with rare mafic phenocrysts.

Contact metamorphism rocks (hornfels) are surrounding the stocks for as much as 0.5km. Small skarns are also noticeable in the surrounding.

Low-sulphide quartz veins are predominant and characterize the Tombstone gold belt.

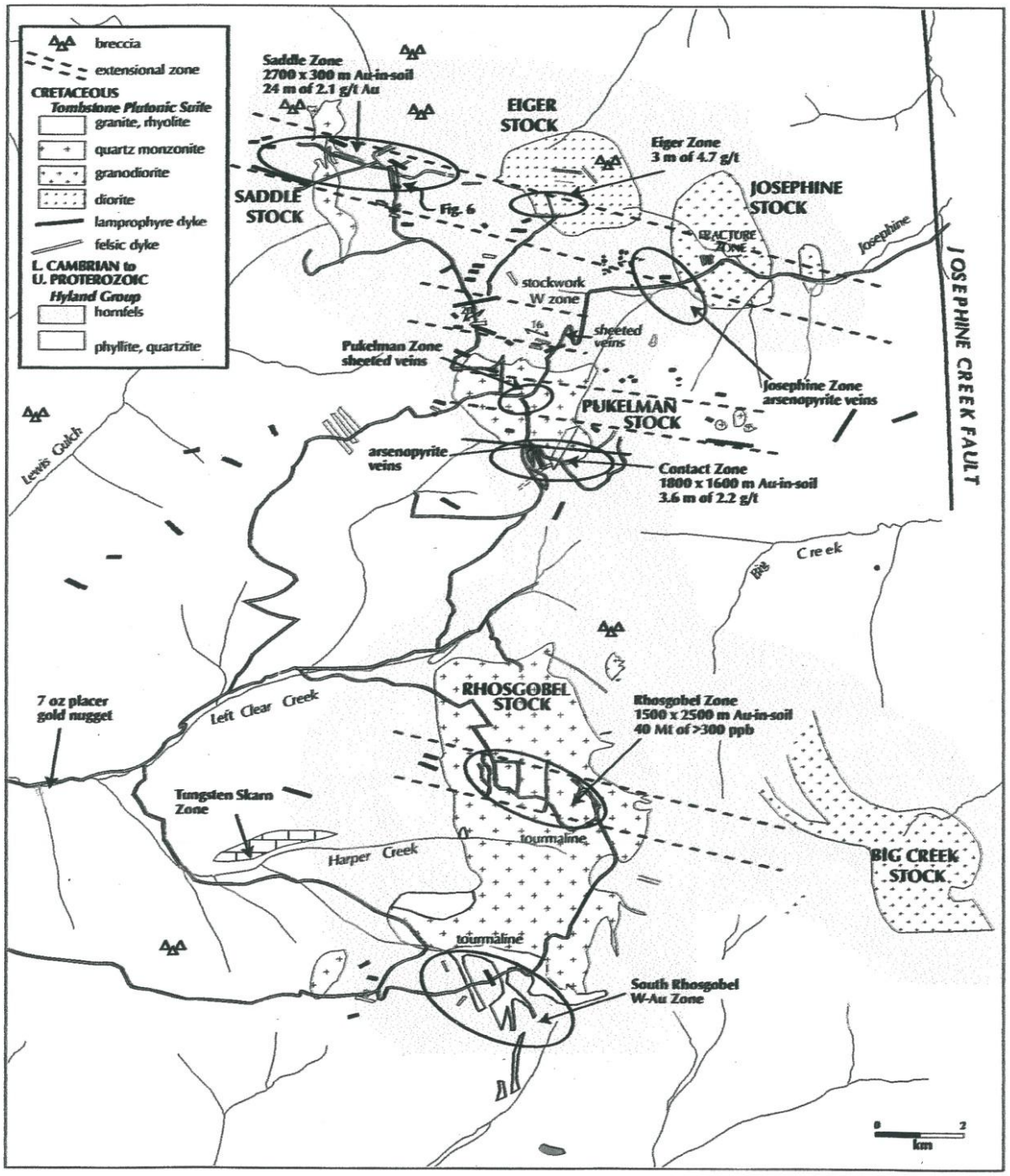
Irregularly spaced auriferous quartz veins are found in the adjacent hornfels.

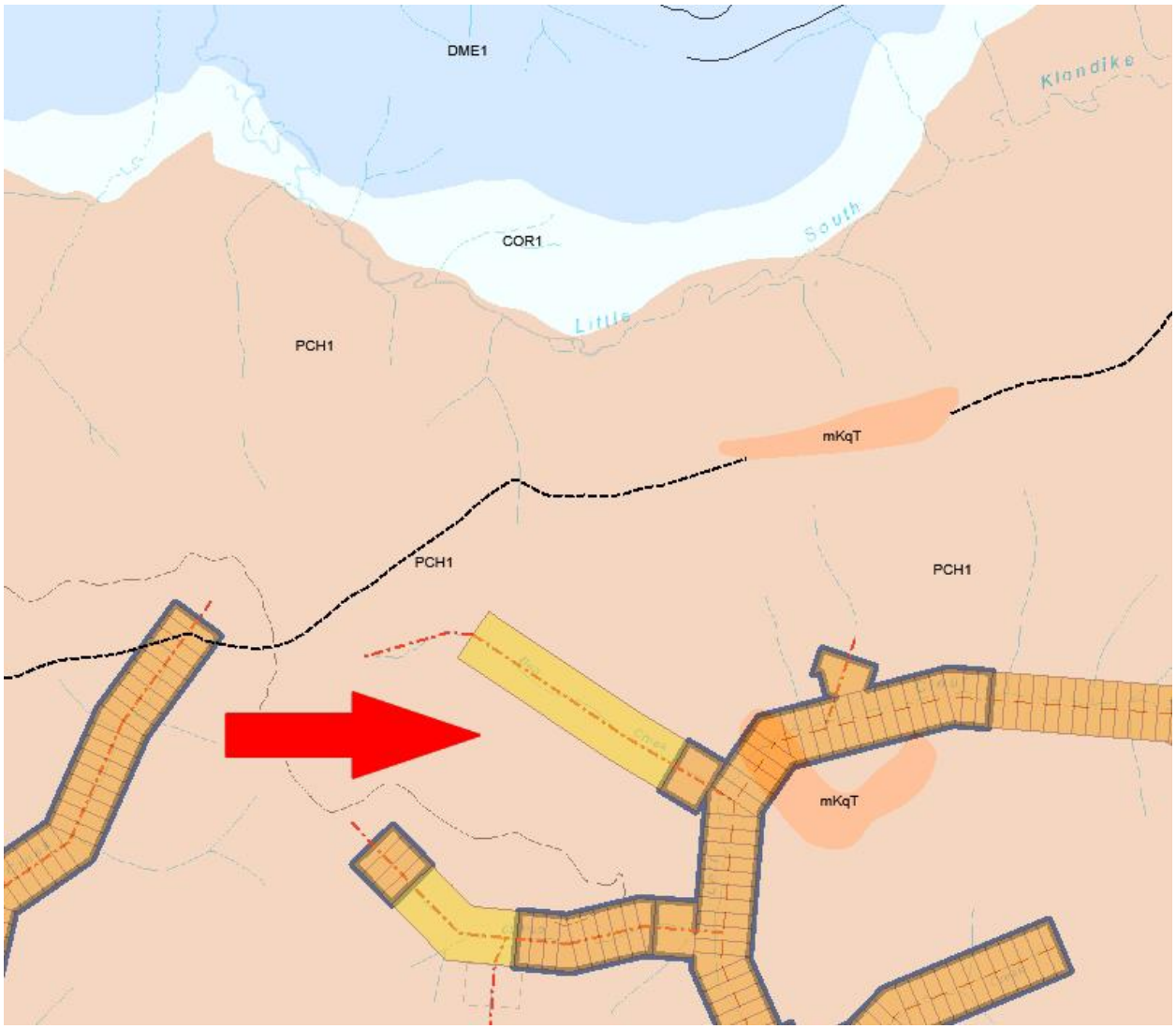
K-feldspar, muscovite, biotite and carbonate are common gangue minerals, with less abundant tourmaline, albite and sericite.

In the Clear Creek area, felsic dikes are a common feature. They present an ESE trending, dip steeply, with a width of 0.5 to 2m.

Lamprophyre dikes are up to 12m wide, contain sparse biotite phenocrysts and biotite-diopside nodules, and cut all intrusive phases.

Some of these dikes contain high values of gold (*Marsh Allen and Hart, 1998).*


breccia
extensional zone
CRETACEOUS
Tombstone Plutonic Suite
granite, rhyolite
quartz monzonite
granodiorite
diorite
lamprophyre dyke
felsic dyke
L. CAMBRIAN to U. PROTEROZOIC
Hyland Group
hornfels
phyllite, quartzite
Saddle Zone
2700 x 300 m Au-in-soil
24 m of 2.1 g/t Au
EIGER STOCK
Eiger Zone
3 m of 4.7 g/t
SADDLE STOCK
Fig. 6
JOSEPHINE STOCK
FRACTURE ZONE
Josephine
JOSEPHINE CREEK FAULT
stockwork W zone
sheeted veins
Pukelman Zone
sheeted veins
Josephine Zone
arsenopyrite veins
PUKELMAN STOCK
Lewis Gulch
arsenopyrite veins
Contact Zone
1800 x 1600 m Au-in-soil
3.6 m of 2.2 g/t
Big Creek
RHOSGOBEL STOCK
Rhosgobel Zone
1500 x 2500 m Au-in-soil
40 Mt of >300 ppb
7 oz placer gold nugget
Left Clear Creek
Tungsten Skarn Zone
Harper Creek
tourmaline
BIG CREEK STOCK
tourmaline
South Rhosgobel W-Au Zone
0
2
km



Legend:

- PCH1: Hyland Group (Proterozoic to Cambrian). Coarse turbiditic clastic units. Pale green shale, quartz rich sandstone, grit, phyllite, limestone, mafic volcanic rocks.
- COR1: Rabbitkettle (upper Proterozoic to lower Cambrian). Basinal limestone. Silty limestone, grey lustrous calcareous phyllite, black slate, quartzose Siltstone, chert.
- DME1: Earn Group (Devonian and Mississipian). Assemblage of submarine fan and channel deposits. Thin bedded, laminate slate with interbedded chert-quartz arenite and wacke; black siliceous siltstone.
- mKqT: Tombstone suite (mid-Cretaceous). Plutonic suit of felsic composition. Coarse grained granite, quartz monzonite and granodiorite.

Green phyllite at Pit 2

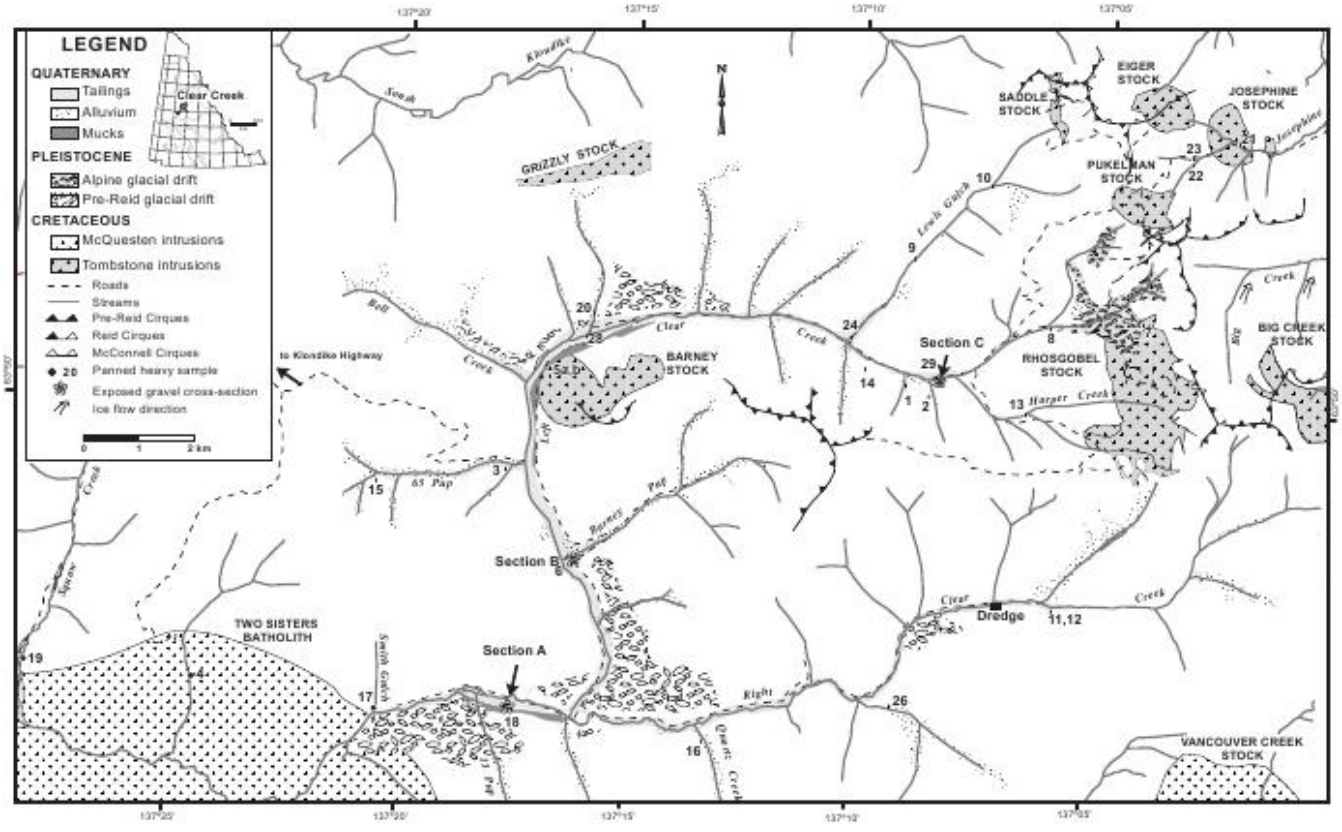
Grit at UTM 386040-7081630

Graphitic phyllite at Pit 6

The specimens visible in the pictures above are by far the most common rocks encountered along the valley and they are the main constituents of the bedrock. From the testing pits we also recovered several rounded clasts of different composition, some of intrusive origine, which at this early stage of our research we can't classifiy as autochthonous.
Part of these rounded clasts could possibly be, like the big boulders of quartz founded along the valley, the remains of a glacial event.

Surficial geology

In 1999, T.L.Allen and C.J.R. Hart from the Yukon Geological Program, together with E.E.Marsh, professor from the Department of Geological Sciences of the Colorado University, published "Placer gold and associated heavy minerals of the Clear Creek drainage", a brilliant and exhaustive report about the surficial geology of Clear Creek.
The report doesn't contain information regarding the gold occurrence at Bell Creek and along some other right tributaries; at that time of depressed mining activities, no official placer exploration occurred along those creeks (beside small private testing attempts with no recorded results).



Location map showing regions mined with the bucket-line dredge, as well as known and suspected heavy mineral occurrences.
Suspected occurrences are based on local abundances of heavy minerals found associated with placer gold in sluice boxes.
Note galena is reported in quartz veins near the Vancouver Creek stock. Geology modified from Murphy et al. (1996) and various assessment reports.
See Yukon Minfile or Murphy (1997) for detailed descriptions and mineral occurrences.

"Three gravel sections, exposed in mining cuts along the Clear Creek drainage, were measured and described in detail during the 1998 field season to determine the sedimentological character of the gravel deposits within the creeks (Fig. 4). These sections were measured at the mouth of Barney Pup (B), Harper's property (C), and a section approximately 1 km downstream from the confluence of the left and right forks of Clear Creek (A; Figs. 1 and 4). Each section displays a slightly different succession of gravels and associated sediments. No other sections were sufficiently exposed during this study due to depressed mining activity. Surficial deposits noted in these sections include gravel, organicrich silt and sand ("muck"); organic-poor sand, and diamicton. The most profitable placer deposits are in creek gravels underlying organic-rich silt and sand, most notably on Clear Creek. These gravels are unconsolidated, clast-supported, and contain well-rounded to subangular clasts ranging from pebble to boulder-size. The matrix generally consists of a mixture of sand, silt, and granules. Clasts were derived from local rock types occurring within the drainage, including schist, quartzite, as well as rocks from nearby intrusions and dykes including granites, diorites, and lamprophyres. Gold is generally reported from the basal fluvial gravels directly overlying bedrock within the valley bottoms and adjacent benches of the Clear Creek drainage.

Lenses of muck, up to 7 m thick, are noted on Clear Creek near its confluence with Left Clear Creek. A few vertebrate fossils have been found within the muck deposits by local placer miners (Dean Klassen, pers. comm., 1998). The mucks on Clear Creek overlie auriferous fluvially washed gravel (Fig. 4). Other surficial deposits within the drainage include colluvial veneers and blankets, debris and sediment flow deposits, and alluvial fans, terraces, and plains (Morison, 1983a and b). Morison (1983a) reported a radiocarbon date of 6230 ± 80 years from unknown material, perhaps wood, in valley bottom gravels from an unlocated section along the Clear Creek drainage, suggesting recent fluvial deposition. Within the valley bottom, unmined gravels appear to be of fluvial origin, suggesting that they were not deposited directly by glaciers. The gravels may have been deposited by melt waters derived from local alpine glaciers, present during the pre-Reid glacial period, eroding and transporting gold from sources further upstream. Morison (1983a; 1984) interpreted these fluvial sediments as braided stream successions formed in an environment of high, fluctuating discharge levels.

At this point we would like to add to this report some of our latest observations regarding the modern placer deposition of Bell Creek. We can only talk about this youngest depositional event because, as already written (see "Description of test pits"), we couldn't manage to dig and expose the upper benches due to the presence of a thick/hard layer of permafrost that stopped our research.

These observations are the product of our first campaign at Bell Creek and they could be disputable; nevertheless, we consider important to try an interpretation of the events possibly occurred at Bell Creek:

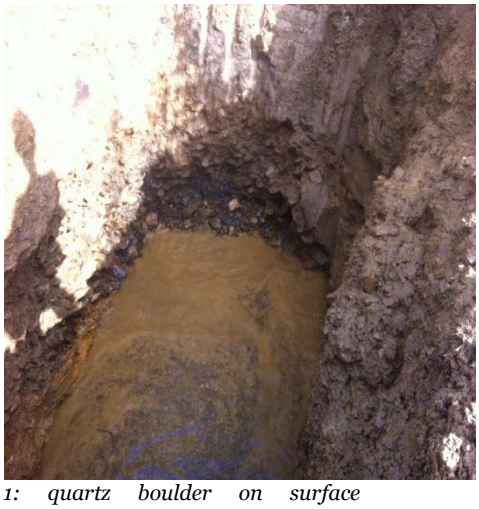
1) A fluvial deposition, represented by rounded clasts from pebbles to cobbles in sandy-gravelly matrix, is well visible at pit 5 and at pit 6; at pit 2 it's also easy predictable but hard to visualize, due to the presence of a large amount of groundwater in the hole. These thin alluvial layers are stained by manganese oxide and they are overlaying a mix of unclassified clasts, mostly angular and subangular, immersed in a matrix of sand and gravel.
2) Above these deposits is visible (particularly at pit 5) another chaotic, thicker package of unsorted clasts, rounded, sub-angular and angular, mixed with a major percentage of reddish sand and silt. A debris-flow type of deposition which seems to be also the product of meltwater activities occurred during more glacial conditions (McConnell?).
3) Along the floodplain, often lying right on the surface, there are quartz boulders of different size. The boulders have also been exposed at different depth in the tested pits and they have been found as well right below the organic coverage on the upper benches. These boulders are also requiring energetic flows to travel and they could confirm the observation at #2.

According with our observation it seems like the surficial geology of Bell Creek Valley has been affected by a couple of glacial episodes. This observation is totally disputable.
In any case, the most relevant (and negative) result of this exploration campaign of 2014, shows the fact that the modern placer deposit here is 'recent' and probably too immature to concentrate a consistent quantity of gold.

Nevertheless, there is still a last chance for us to find a better pay-ground, and it's represented by the ancient, upper benches (too frozen to be dug at the time).
During the past August we prepared the ground, by scraping the surface enough to expose the permafrost.
Next summer, as soon as the ice melts, we will perform the last attempt of our target evaluation campaign at Bell Creek: testing the benches.

Pit 3: alluvium in manganese oxide

Pit 5: bedrock (on the left)



Pit 1: quartz boulder on surface

Boulders at UTM 386540-7081027

Pit 2

Pit 7: debris flow and boulders

Pit 6

Particular of pit 6

Glacial history

This first target evaluation campaign at Bell Creek was conducted with a simple purpose: to determine the eventual presence of a profitable gold concentration in the placer deposit.
The gold history and the geological characteristic of the area gave us good hopes.

In one month of work we actually tested several pits that produced poor results; way below our worse expectations.
After digging pit #9, it became suddenly evident that at Bell Creek some invasive event modified the original depositional setting. This event is possibly related with glacial conditions.
In this chapter we will expose some of our reflections, without the presumption to go deeper in details, especially chronologically; to analyze the glacial history wasn't our goal and we are not pretending to be right. These observations are definitely disputable and not exhaustive.
Here they are:

- During the preliminary exploration of the area, we noticed a substantial number of rounded boulders (from 30cm to 1 meter), all made by milky quartz, scattered here and there along the surface of the floodplain. At the same time we also recorded the presence of several stretches of upper benches, apparently coeval between them, laying at modest elevation above the floodplain (≈4-6m).
  Later on, we also found the same boulders lying on these benches, right below the organic coverage. Same boulders have been also recovered at different depth in the test pits, often mixed with angular clasts made of much softer material.
  These boulders are not part of a fluvial deposition.

- In the test pits dug along the floodplain, above a layer of fluvial deposit represented by pebbles and cobbles immersed in a matrix of sand and gravel, all stained by manganese oxide (possibly sign of warmer condition), is evident a package of debris-flow type of deposit that should be the product of energetic flows due to melt waters, during more glacial conditions happened in recent time (Mc Connell?).

- After testing the pits we performed a quick surveying of the boulders scattered along the surface of the floodplain. We recorded the UTMs in order to transfer the locations on map. The result is visible on the picture below. These boulders seem to be allochthonous and them distribution seems to indicate that they could

be coming from a different watershed: the South Little Klondike Valley, where (according with Duk-Rodkin) glaciers were active during Reid/pre-Reid age.

If that's correct, the boulders could possibly represent the overflow of a lateral moraine. This event could have involved the energetic flows of water necessary to remove the original alluvium.

Let's try at this point to rebuild a possible succession of events:

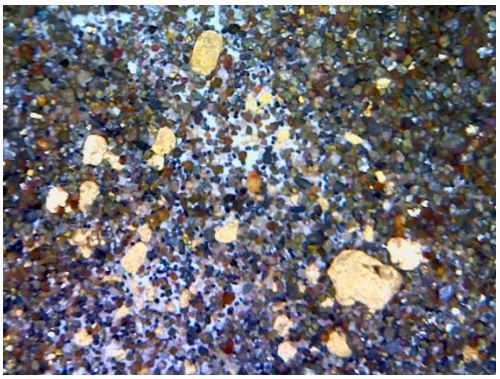
1) Pre-Reid/Reid-age: overflow coming from the South Little Klondike Valley into the Bell Creek watershed, with the transportation of morainic type of material, and possibly with erosional action.

2) Pre-McConnell-age: Fluvial deposition.

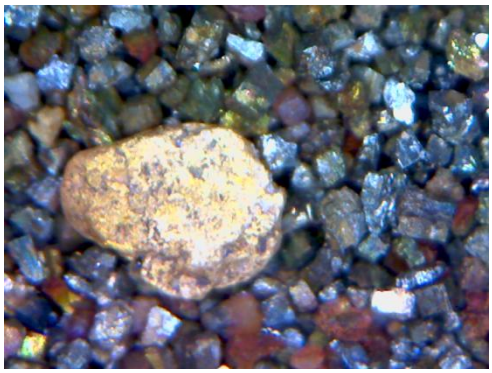
3) McConnell-age: augment of glacial condition with meltwater activities and consequent debris-flow type of deposition (visible at pit 5).

Location of the quartz boulders (white dots) and possibly points of overflow (blue)

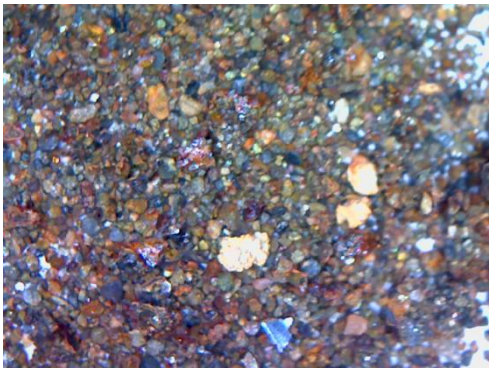
Gold



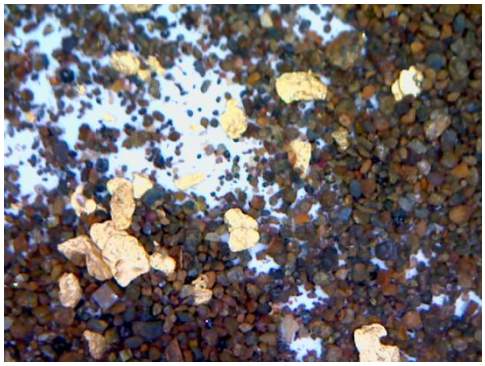
gold from pit 2 (65x)



gold from pit 2 (225x)



fine gold at pit 5 (65x)



gold from pit 6 (65x)

extremely poor recovery from pit 2

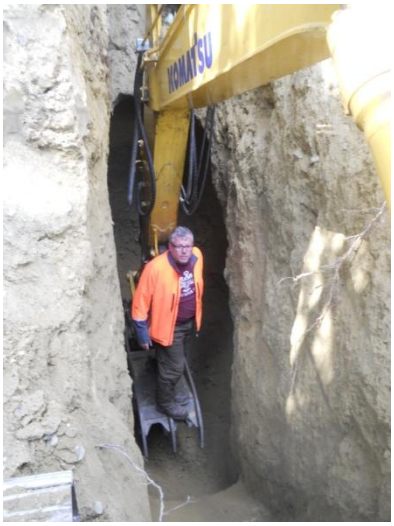
pit 6: a bit better but not enough

As already written, during this target evaluation campaign of 2014 we dug 9 pits but we reached the bedrock only in three of those: at pit 2, 5 and 6.
From each hole we processed ≥15 cubic meters of material selected from the contact with bedrock (included 40-50cm of the same bedrock).
The gold recovered was less than 1 gram and composed by extremely fine and flattened flakes (see pictures above); we assume that part of the gold probably escaped from the sluice of our wash plant (too big of a water flow for such of small size gold).
We tried to recover more flakes by panning the same material but the results didn't improve that much: there is simply not enough gold in that placer!
Slightly better was the situation at pit 6 where the flakes are a bit coarser and we recovered almost two grams of gold.
For the moment we are far away from the right condition for developing a mining site.
Next year we will test the upper benches, hoping for better discoveries.
In case of similar scarce results we will leave the Bell Creek for better ground.

CONCLUSIONS

The field work at Bell Creek lasted only a month, between August and September of 2014. Previously we invested time and energy into preparing this project with preliminary explorations and with a period of study and paperwork necessary to acquire the most useful information regarding our targeted area.
It takes a total of 3-4 months to prepare and to perform a small-size project like this one at Bell Creek, and quite a bit of financing.
The placer gold exploration is an extremely hard business and not always rewarding.
From this point of view Bell Creek was a good lesson for our group.

As we mentioned in the introduction, we started this campaign with high expectations: according to our preliminary research, the area showed the right history and the perfect geomorphology for being considered a good target.
We were also aware about the possibility that past glacial activities could have interested the area, with all the implication that they could reserve to the surficial geology.
By the end of the winter of 2013 we decided that the chances to achieve some good result were more than enough to justify this expedition and we started to get organized.
Unfortunately, the results of our bulk sampling campaign showed the existence of an immature placer, too young to concentrate a valuable quantity of gold.
This is certainly a defeat for us, even though it is considered a normal part of this tough business.
Next year we will perform a quick testing campaign on the upper benches and, if the results will be scarce again, we will let the lease expire and move to a different project.
The research will go on.



ACKNOWLEDGEMENTS

The target evaluation campaign at Bell Creek was over by the end of September, without the expected results. The recovery of gold was extremely poor and we have to accept the loss as part of this peculiar business.

During the next summer we will complete the testing on the upper benches, hoping for better numbers, and then we will move to other projects. Exploring new ground will be always our main goal.

As any end of a project, it's now time to thank the workmates for the job done during this challenging campaign.

Our expedition wouldn't have been possible without the help of many.

Everyone here has played an important role for the realization of this project. In the following list nobody was less important than others.

Thanks to Max Michaylitchev, for the work done as staker and prospector and for the many time that he has been part of crazy expeditions in the middle of nowhere, just for the joy to have another adventure.

Thanks to Bruce McArthur, for his usual selfless help and for the energy that he always transmit to the others.

Thanks to Joerg Loetz, our new partner and friend, for his enthusiastic help and for the courage that he showed while dealing with new, unknown situations.

Thanks to Rocco Frizzi, a goldsmith with the passion for the outdoors. Rocco came to visit us to have an adventurous summer and ended up helping and cooking excellent Italian food.

Thanks again to the Yukon Government and to its brilliant Geological department, for financing a big part of this research and for the assistance provided in many occasion. The YMEP (Yukon Mining Exploration Program) has been a fundamental help for our group and we hope that the product of our effort will meet the expectations that this program deserve.

Sandro Frizzi

29 December 2014