YEIP
2007
-056

YMIP 07-056

# 2007 GEOPHYSICAL, GEOLOGICAL AND GEOCHEMICAL REPORT ON THE TONI 9-28 CLAIMS

(Work Performed: June 25-28, 2007)

| Claim Names: | Grant No's |
|---|---|
| Toni 9-14 | YC36199-YC36204 |
| Toni 15-28 | YC44641-YC44654 |

DAWSON MINING DISTRICT, YUKON TERRITORY
NTS: 116C/02 &115N/15

Latitude 64° 01' N
Longitude 140° 43' W

Owner:
**Roger Hulstein**
106 Wilson Drive
Whitehorse, Yukon Territory
Y1A 5R2

Prepared by:
Roger Hulstein, B.Sc., P.Geo.

December 4, 2007

## SUMMARY

The Toni 9-28 claims are located in west-central Yukon, collectively cover an area of approximately 400 hectares and are comprised of 20 Yukon two-post Quartz claims owned one hundred percent by Roger Hulstein. They are located in the Sixtymile River valley, approximately 75 km west of Dawson City, Yukon. The area is an active placer gold mining district having produced in excess of 338,682 crude ounces since 1892. The bedrock source for most of the placer gold is unknown. Access can be easily gained in the summer by two wheel drive vehicles.

Most of the property is underlain by argillic and propylitic altered andesitic volcanics of the Cretaceous Carmacks Group. The northeast trending Sixtymile fault juxtaposes the Carmacks Group volcanics to the northwest against the Devonian to Mississippian metamorphic siliciclastic rocks of the Nasina Assemblage to the southeast. The Carmacks Group volcanic rocks are preserved in a graben or half graben structure in the Sixtymile River valley; extend northeast from the mouth of Miller Creek to Glacier Creek, a distance of approximately five kilometers.

The Glasmacher epithermal vein occurrence is currently covered by placer mined gravels. It was explored in 2007 by a GPS controlled ground magnetic survey. On the southeast side of the property, the Sixtymile fault, a bounding fault on the southeast side of the graben structure, was prospected, reconnaissance geologically mapped and selectively soil sampled.

Previous workers examined the Glasmacher occurrence when it was exposed by placer miners and obtained values of up to 12 g/t gold from quartz sulphide veins. It is estimated that depth to bedrock is about 5 m in most areas of the Sixtymile valley. The 2007 ground magnetic survey shows that the occurrence likely lies within a magnetic low that trends approximately east – west for at least 500 m and is about 300 m wide.

Prospecting and mapping in 2007 along the Sixtymile fault found variably altered andesite, weakly altered siliciclastic metamorphic rocks and possible gouge. Selective soil sampling across and along the fault structure returned eight soil samples anomalous in gold (>0.28 ppm to < 0.821 ppm) over a distance of approximately 500 m. In addition to gold a number of the soil samples in the same area also yielded anomalous values for; Ag, As, Bi, Cu, Mo, Pb, Sb and Zn. The geological setting and anomalous geochemical values are consistent with that found in epithermal vein type deposits.

Proposed work consists of additional geochemical soil surveys, geological mapping, prospecting, ground magnetic and electromagnetic surveys. Anomalous areas should be tested by trenching (if possible) followed by diamond drilling if results are encouraging.

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## 1.0 INTRODUCTION

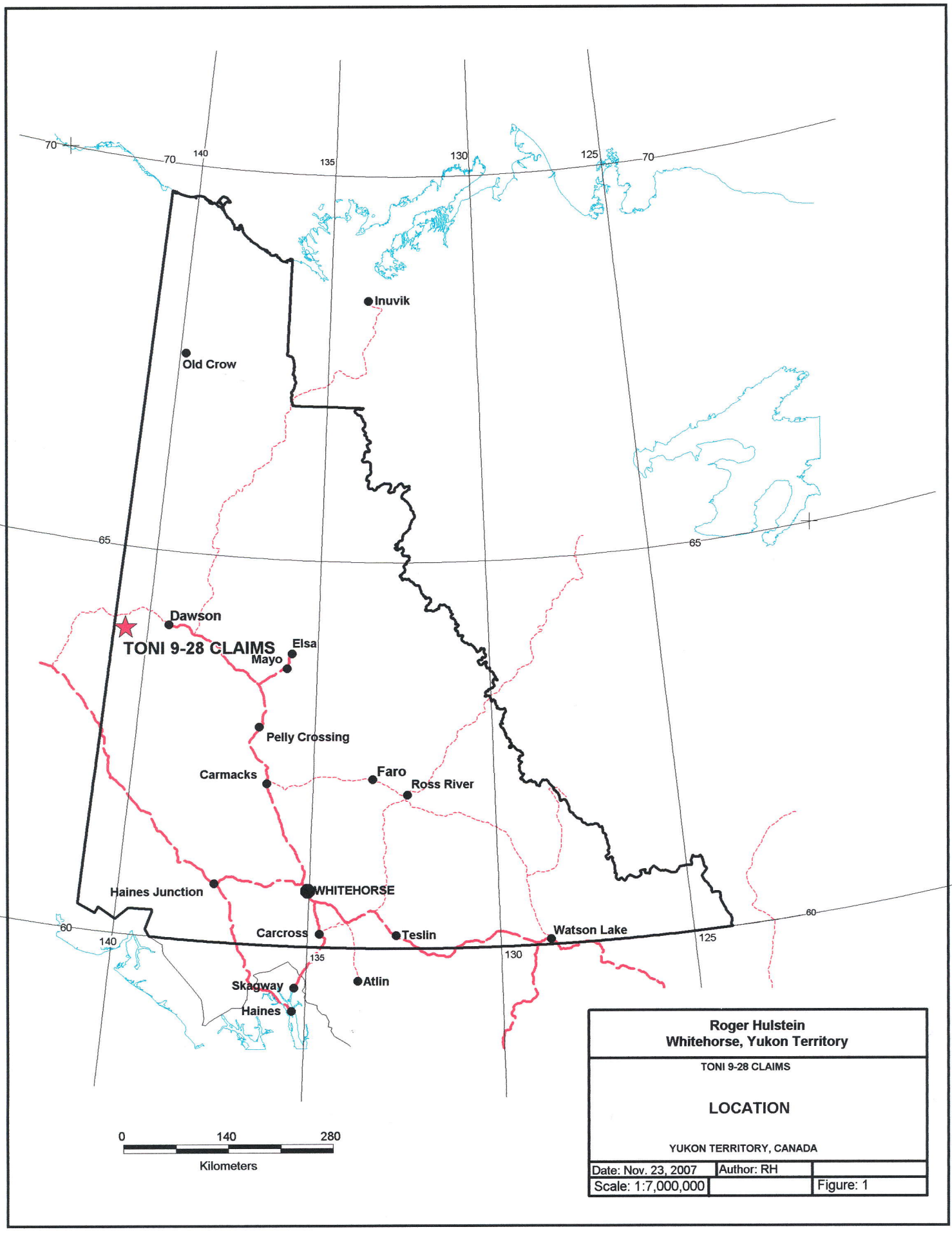
The purpose of this report is to fulfill the work assessments of the Yukon Quartz Mining Act on the Toni 9-28 claims. The report describes the 2007 work program which consisted of a ground magnetic survey over the reported location of the Glasmacher epithermal vein occurrence plus reconnaissance geological mapping, soil sampling and prospecting over the northeast trending Sixtymile Fault. This fault juxtaposes the Cretaceous Carmacks volcanics against the Devonian – Mississippian siliciclastic metamorphic rocks of the Nasina Assemblage. It also describes the location, access, history, geological setting, known mineralization of the property and outlines a proposed exploration program to further explore the Glasmacher occurrence area and the Sixtymile fault for gold-silver bearing epithermal vein type mineralization.

### 1.1 Location and Access

The Toni 9-28 claims are located in the Sixtymile placer district and cover a portion of the valley bottom occupied by the northeast flowing Sixtymile River at the mouth of tributary Big Gold Creek. The property is located on map sheet NTS 116C/02 and 115N/15 (Figure 1).

The property is located approximately 75 km due west of Dawson. Access to the project area is via the posted Sixtymile Road that turns south off the Top of the World Highway (Hwy 11) at approximately kilometer 87. The claims are located at the bottom of the valley about 12 km from the turn off. Numerous roads built, maintained and changed, as needed by the local placer miners, access the northwest side of the claim group. The southeast side of the claim group is accessed by foot from roads in the valley bottom; this includes fording the Sixtymile River. The roads are generally usable by 2WD truck from early June to late September. The Top of the World Highway is not maintained during winter months.

Daily plane service can be gained in Dawson City to Whitehorse, where there is daily jet airplane service to Vancouver, British Columbia and other points south.


70
140
135
130
125
70
Inuvik
Old Crow
65
65
Dawson
TONI 9-28 CLAIMS
Elsa
Mayo
Pelly Crossing
Carmacks
Faro
Ross River
Haines Junction
WHITEHORSE
60
60
140
Carcross
Teslin
Watson Lake
125
130
135
Atlin
Skagway
Haines
0
140
280
Kilometers
Roger Hulstein
Whitehorse, Yukon Territory
TONI 9-28 CLAIMS
LOCATION
YUKON TERRITORY, CANADA
Date: Nov. 23, 2007
Author: RH
Scale: 1:7,000,000
Figure: 1

## 1.2 Topography, Vegetation and Climate

Topography in the region is typical of an incised peneplain with steep hillsides and rounded crests. The area was beyond the limits of the last two continental glacial events and evidence of glaciation in the region is a result of localized alpine glaciers. Alluvium in the valleys is mostly locally derived. Hill slopes are covered with a veneer of colluvium also locally derived. Elevation ranges from 2,100 feet in the Sixtymile valley to approximately 3,800 feet on nearby ridges. In the valley bottom permafrost is not a consideration except near the well vegetated hillsides. On the hillsides and ridge spurs, particularly northerly facing slopes and poorly drained areas, permafrost (often as frozen black muck) is a serious hindrance to exploration.

Rock outcrop in the area is restricted to ridges, small cliffs, creek bottoms and along road and trench cuts. The Glasmacher occurrence, located in the Sixtymile River valley, has been exposed in the past by placer miners but is now covered by placer mined gravel tailings and waste piles. These placer tailings are estimated to be <5m-8m thick. Often bedrock type can be determined by angular boulders, of consistent type, piled (by placer miner activity) on top of the more typical rounded mixed lithologies of river gravel and boulders.

Vegetation in the valley bottoms consists of alder, dwarf birch, balsam fir, white and black spruce. Ground cover in areas of thin tree cover consists of alpine plants, 'buckbrush' (alder), dwarf willow and moss. Beavers dams in the numerous side channels and placer drainages result in numerous ponds that restrict and hinder access. Hillsides and ridges are covered with pine, spruce, birch and poplar on well drained slopes and stunted black spruce in areas of permafrost. Treeline is at approximately 4,000 feet. Vegetation is generally more abundant on east and south facing slopes. Grizzly and black bears as well as moose frequent the valley bottom, attracted by young vegetation on the placer tailings.

Climate is characterized by low precipitation and a wide temperature range. Winters are cold and temperatures of –30°C to –45°C are common. Summers are moderately cool with daily highs of 10°C to 25°C. Thunders showers are a common occurrence. Smoke from forest fires can be thick at certain times. The seasonal window for prospecting is from June to mid September.

## 1.3 History

The Sixtymile district has been worked for placer gold since the discovery of gold on Miller Creek in 1892. Placer gold production likely exceeds the recorded figure of 338,682 ounces won from the creeks during the period 1892-2005 (LeBarge, 2006). The bulk of the placer gold was mined from Miller, Glacier, Bedrock and Little Gold Creeks, plus the Sixtymile River.

Along with the placer activity, lode prospecting of the district has occurred since the first hard rock claims were staked over the nearby Miller galena occurrence in 1896 (Yukon Minfile, 2003).

Some technical information on the geology and mineralization in the Sixtymile area is contained in a 1984 Master's dissertation by Ulrich Glasmacher (Glasmacher, 1984). He reported on the paragenesis and characterization of mineralization found in the area. Ulrich Glasmacher was also responsible for other studies in the Sixtymile River area (Glasmacher and Freidrich, 1992) including consulting work for Klondike Gold Mining Corporation in 1988.

Kennecott Canada Exploration Inc. staked and optioned most of the ground beween Miller and Glacier Creeks and Sixtymile River in 1998 (Hulstein and Zuran, 1999). Kennecott compiled the previous data and carried out a property mapping, property stream and soil geochemisty program, a gravity survey and a helicopter airborne magnetic survey. Trenching was carried out on the ridge southwest of Miller Creek (now covered by the Rod 1-8 claims) and a few test pits in the Sixtymile River valley.

In 2003 Roger Hulstein staked the Paul 1-10 and Toni 1-8 claims and vended them to North American Gold Inc. (now Northland Resources Inc.). North American Gold Inc. carried out a small trenching program in 2003 in an effort to locate the vein structure intersected in 1988 by Klondike Gold Mining Corporation (Hulstein, 2004). In 2005 and 2006 Hulstein staked the Toni 9-28 claims.

The following is a summary from Yukon Minfile (2003), in chronological order, of significant work and events carried out in Sixtymile valley and nearby area since 1892.

1892: Placer gold discovered in the Sixtymile River area by C. Miller.

1896: Claims staked over the Miller galena occurrence located near the headwaters of Miller Creek.

Early 1900's: Placer miners found coal in Tertiary sediments located north of the property

1915-1916: North American Trading and Transportation Co. dredged near the mouth of Miller Creek.

1920: (or prior), placer miners find galena, sphalerite and arsenopyrite veining discovered in Sixtymile valley (Per occurrence – Yukon Minfile).

1929-1941: The dredge was refurbished by the Holbrook Dredging Co. which mined in the Sixtymile Valley.

1947-1959: A new dredge was constructed by Yukon Exploration and Yukon Placer Mining Co. which mined the lower reaches of Glacier and Big Gold Creeks and part of Sixtymile River.

1965: Per occurrence in Sixtymile Valley, near mouth of Miller Creek, trenched and tested by 2 short drill holes. Northern Exploration Limited trenched by bulldozer in WY gulch area.

1981: W. Yaremico staked WY claims. Fred Chudy (Chumar Placers Ltd., later Klondike Sand and Gravel Co. Ltd. and Klondike Underground Mining Ltd.) commenced underground placer operations on Miller Creek (upper adit). Lower adit completed later and U/G mining ended 1990.

1984: The Glasmacher occurrence (Minfile No. 116C 153) was staked by Noranda.

1985: Erwin Kreft restaked Per occurrence and area. Jon Millhouse trenched Vance claims. Noranda soil, stream sediment and rock sampled their claims.

1986: Erwin Kreft trenched Per occurrence and near the Garea, Esso Minerals Canada Limited tied onto Erwin Kreft ground in Sixtymile Valley.

1987: Esso mapped and sampled, Erwin Kreft trenched.

1989: Homestake Mineral Development Co. Ltd. optioned Esso's ground, then mapped and sampled it.

1990: Sixtymile Placers Ltd. (G. Hakonson) auger drilled 205 holes from mouth of Big Gold Creek to 1.2km below Five Mile Creek.

1998: Kennecott Canada Exploration Inc. staked and optioned most of the ground beween Miller and Glacier Creeks and Sixtymile River. Kennecott carried out a property mapping, property stream and soil geochemisty program, a gravity survey and a helicopter airborne magnetic survey. Trenching was carried out on the ridge southwest of Miller Creek and a few test pits in the Sixtymile River valley.

2003: Roger Hulstein restaked the ground previously held by Kennecott and others as the Paul 1-10 and Toni 1-8 claims and vended them to North American Gold Inc. (now Northland Resources Inc.). North American Gold Inc. carried out a small trenching program in 2003 in an effort to locate the vein structure intersected in 1988 by Klondike Gold Mining Corporation (Hulstein, 2004). In 2004 North American Gold Inc. optioned the Vance 1-5 claims from the estate of prospector Jon Millhouse.

2005: Roger Hulstein staked the Toni 9-14 claims and carried out a reconnaissance program in 2006. In 2006 he staked the Toni 15-28 claims.

## 1.4 2007 Work Program

The 2007 exploration program was carried out by R. Hulstein, on June 25-28, 2007. Work consisted of a one day ground magnetic survey utilizing a GEM Systems GSM-19T proton precession magnetometer over the reported location (in Yukon Minfile, 2003) of the Glasmacher occurrence. Two days were spent on reconnaissance mapping, soil sampling and prospecting over the southeast bounding Sixitymile fault.

A hand-held GPS receiver (Garmin GPSmap 60CSx) was used to plot locations of soil samples, magnetometer grid stations and other features (approximate +/- 5m accuracy). Soil samples were shipped to ALS Chemex in North Vancouver, B.C for gold analysis plus 34 other elements.

## 1.5 Claim Status

The Toni 9-28 claims cover an area of approximately 400 hectares and consist of 20 unsurveyed contiguous two-post Yukon 'Quartz' claims (Figure 2). The claims were staked according to the Yukon Quartz Mining Act and are located in the Dawson Mining District. They are shown on claim sheet 115N/15 and 116C/2 and are available for viewing at the Dawson Mining Recorders Office. The claims listed below (Table 1) are registered in the name of Roger Hulstein and owned one hundred percent by him.

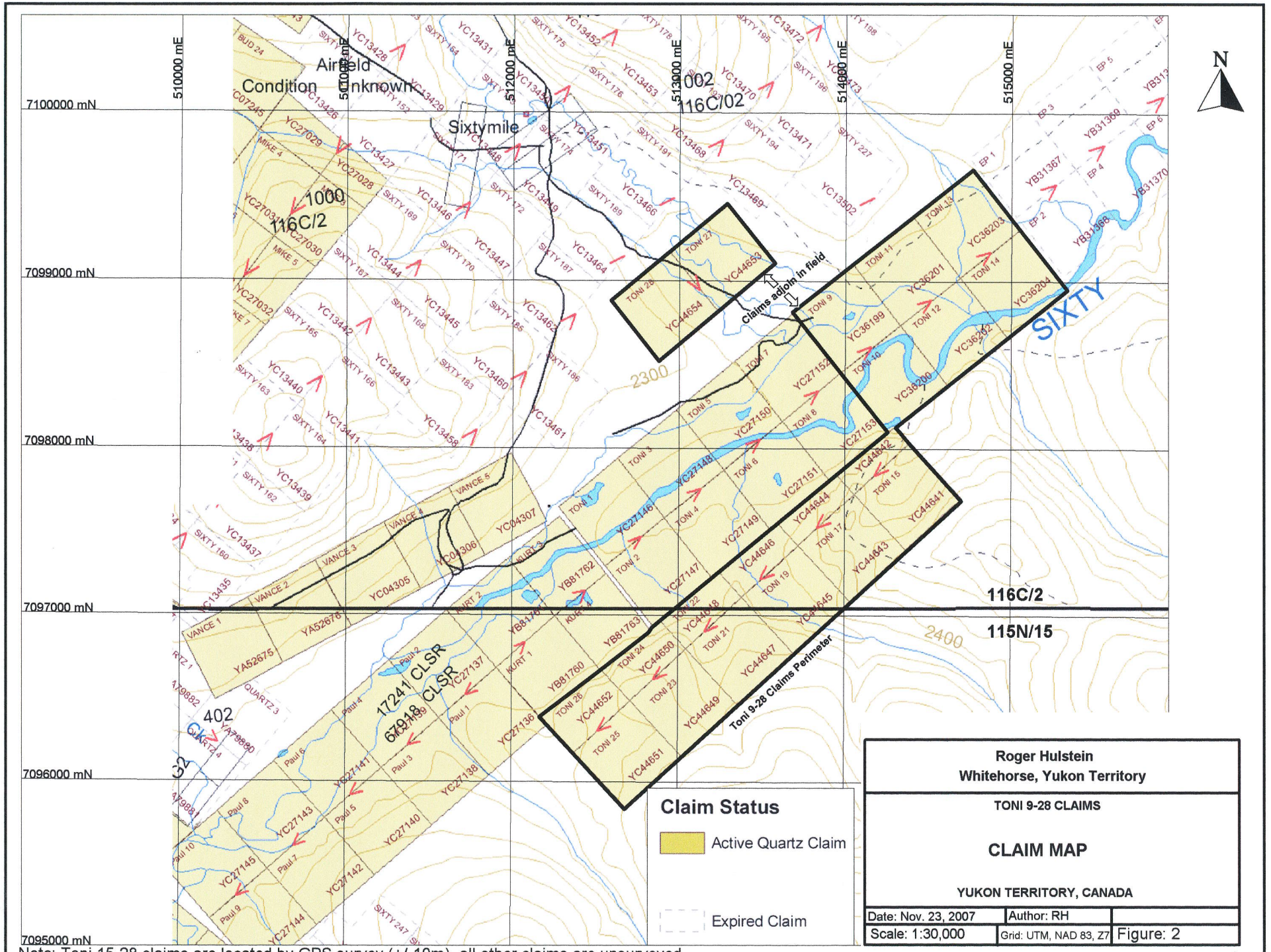
The Toni 9-14 were staked in June 2005 and the Toni 15-28 in June 2006.

**Table 1. List of Claims**

| Claim Name | Grant Number | Expiry Date* |
|---|---|---|
| | | |
| Toni 9 - 12 | YC36199-YC36202 | July 11, 2011 |
| Toni 13, Toni 14 | YC36203, YC36204 | July 11, 2009 |
| Toni 15-28 | YC44641-YC44653 | July 11, 2009 |
| | | |

*Subject to this report being accepted as fulfilling assessment requirements.

The Toni 9-14 and all other claims shown on Figure 2, with the exception of the Toni 15-28 claims, are drawn on a best fit basis with respect to topography and preexisting claims. The Toni 15-28 claims are plotted as per coordinates obtained by a GPS receiver (a Garmin GPSmap 60CSx). The earlier claims on the map (Figure 2), drawn when the claims were recorded, shows claim overlaps and gaps between claims where there are actually none. Figures 3 to Figure 6 show the approximate claim group outlines based on a later GPS claim survey of all the claims.




Roger Hulstein
Whitehorse, Yukon Territory

TONI 9-28 CLAIMS

CLAIM MAP

YUKON TERRITORY, CANADA

| | | |
|---|---|---|
| Date: Nov. 23, 2007 | Author: RH | |
| Scale: 1:30,000 | Grid: UTM, NAD 83, Z7 | Figure: 2 |

Note: Toni 15-28 claims are located by GPS survey (+/-10m), all other claims are unsurveyed.

## 2.0 REGIONAL GEOLOGY

The first geological investigation of the Sixtymile River area was by J. E. Spurr in 1896-97 (Spurr and Goodrich, 1898), followed by Cockfield in 1917 (Cockfield, 1921). More recently the area was mapped at 1:250,000 scale by Tempelman-Kluit in 1970-1972 (Tempelman-Kluit, 1973), Green in 1961 (Green, 1972) and Mortenson (1988, 1996).

The property lies between the Tintina and Denali Faults within the Ominica Belt (Wheeler, J.O. and McFeely, P., 1991). The area is underlain by two distinct lithotectonic (pre-accretion) assemblages: 1) a medium to high grade, polydeformed metasedimentary and meta-igneous rocks of the Yukon-Tanana Terrane (YTT); and 2), deformed and metamorphosed rocks of the Slide Mountain Terrane (Mortenson, 1988, 1996). Both are mainly Paleozoic in age and were juxtaposed by regional scale thrust faults in early Mesozoic time, a period of terrane accretion that affected much of the northern Cordillera.

Locally, the YTT consists of two main assemblages of supracrustal rocks, the Late Devonian (?) to mid-Mississippian Nasina assemblage and the mid-Permian Klondike Schist assemblage (Mortenson, 1996) and three distinct suites of metaplutonic rocks (Figure 3). The Nasina consists of metamorphosed psammites, mainly quartz-muscovite-chlorite schist and quartzite, +/- carbonaceous material, interlayered mafic schist and amphibolite and volumetrically minor amounts of marble, conglomerate and felsic schist. The Klondike Schist assemblage is comprised mainly of a variety of felsic schists interlayered with non-carbonaceous fine grained micaceous quartzite and quartz-feldspar-muscovite-biotite (+/- chlorite) schist. Local layers of chlorite schist, metagabbro, rare bands of marble and carbonaceous quartz-muscovite schist are found within the felsic schists.

The Klondike placer camp (approximately 12,000,000 million ounces of placer gold produced) is underlain predominantly by units of the Klondike Schist assemblage.

According to Mortenson (1996) three distinct suites of metaplutonic rocks found within the YTT are:

1) Devonian – Mississippian feldspar and quartz-feldspar augen schist interpreted to be meta-porphyry sills and/or transposed dykes
2) Early Mississippian granitic orthogneiss, e.g. the Fiftymile batholith.
3) mid-Permian quartz monzonite gneiss and quartz (+/-feldspar) augen schist (Sulphur Creek orthogneiss).

Rocks of the Paleozoic Slide Mountain Terrane include massive greenstone and a variety of altered ultramafic rocks. The ultramafic rocks commonly denote

511000 mE
512000 mE
513000 mE
514000 mE
515000 mE
516000 mN
7099000 mN
7098000 mN
7097000 mN
7096000 mN
2500
Glacier Creek
Big Gold Creek
Sixty Mile River
Sixtymile Fault
Approximate perimeter Toni 9-28 claims
Kva
Kst
DMs
Grease
RH07S001
RH07S002
RH07S003
RH07S004
RH07S005
RH07S006
RH07S007
RH07S008
RH07S009
RH07S010
RH07S011
RH07S012
RH07S013
RH07S014
RH07S015
RH07S016
RH07S017
RH07S018
RH07S019
RH07188
RH07189
RH07190
RH07191
RH07192
RH07193
RH07194
RH07195
RH07196
RH07197
N

## Legend

**Cretaceous**

Kva — Carmacks Group; predominently andesite volcanic flows, breccias and dykes

Kst — Carmacks Group; sandstone and pebble to cobble conglomerate

**Devonian - Mississippian**

DMs — Nasina Assemblage; predominently graphitic quartzite and muscovite rich schists

**Symbols**

- Normal Fault
- Approximate geological contact
- Propylitic to argillic alteration
- RH07S014 Soil sample site and number
- RH07194 Field station
- Road
- Elevation contour (interval 100 feet)
- Isolated outcrop or felsenmeer
- Minfile Occurrence No. 116C 153 "Glasmacher", location approximate


**Roger Hulstein**
**Whitehorse, Yukon Territory**


TONI 9-28 CLAIMS

# GEOLOGICAL COMPILATION and SAMPLE NUMBERS

YUKON TERRITORY, CANADA

| | | |
|---|---|---|
| Date: Nov. 23, 2007 | Author: RH | |
| Scale: 1:15,000 | Grid: UTM, NAD 27 | Figure: 3 |

thrust (and normal?) faults, are partially to wholly serpentinized and locally exhibit quartz-carbonate alteration. The mined out Clinton Creek asbestos deposit, located approximately 40 km to the north of the property, is hosted by units of Slide Mountain Terrane.

Jurassic quartz monzonite bodies intrude the YTT and Mortenson (1996) noted that field relationships indicate that they intruded prior to both Early (?) Jurassic regional thrust imbrication and Early Cretaceous normal faulting.

Post accretion units uncomformably overly rocks of the YTT and Slide Mountain terrane. These units consist of a sequence of unmetamorphosed sedimentary and volcanic rocks of middle (?) and Late Cretaceous age (Mortenson, 1996). The lower part of the unit typically consists of sandstone and pebble to cobble conglomerate that is overlain by massive andestic flows and breccias that are correlated with the (68-76Ma) Carmacks Group.

Bodies of Late Cretaceous fine to medium grained, equigranular biotite-hornblende quartz monzonite and granodiorite are thought to be comagmatic with the Carmacks group volcanics.

Volumetrically minor amounts of Miocene aged quartz pebble conglomerate, sandstone, shale minor tuffs and olivine basalt are preserved in the Sixtymile lineament – graben.

Units of the Nasina and Klondike Schist assemblage and the three associated orthogneiss units show the effects of penetrative ductile deformation and metamorphism at middle greenschist to lower amphibolite facies (Mortenson, 1996). Rocks of the Slide Mountain Terrane generally only display evidence of brittle shearing and open folding. Units of the Slide Mountain and Yukon Tanana terranes are juxtaposed along mainly shallowly to moderately dipping fault zones that are interpreted as thrust faults. Low angle normal faults are also interpreted between the Fiftymile Batholith and overlying rocks.

Middle and Late Cretaceous sedimentary and volcanic rocks are generally undeformed although they have been at least locally folded (Mortenson, 1996). The Tintina and Denali faults found to the northeast and southwest of the property respectfully, trend northwest and are major crustal-scale transcurrent dextral faults of Tertiary (?) age.

The Sixtymile lineament, a major northeast trending fault structure that extends to Tok, Alaska, underlies the east side of the Sixtymile River valley and approximates the eastern property boundary. In the Sixtymile placer district, the valley follows a graben structure that down drops Cretaceous Carmacks Group rocks against Nasina and Klondike Schist Assemblage rocks. Other north to northeast trending fault structures are suspected to underlie prominent lineaments and form the contacts of the Carmacks Group volcanic rocks. The

labeled Sixtymile fault on Figure 3 locally juxtaposes the Carmacks Group against metamorphic rocks of the Nasina Assemblage.

Adjacent claims in the Sixtymile River valley, the Paul 1-6, Kurt and Vance, partially cover the Per galena-sphalerite-arsenopyrite-pyrite vein occurrence and weak, or distal, porphyry style alteration and mineralization, mostly pyrite-carbonate altered andesites.

Regionally significant mineralization can be found near the property. Silver-gold-quartz bearing veins are found on the Mos property 5km to the southeast of the Sixtymile property. These veins and others located even further east (~20km ESE of the property), along with magnetite skarns and weak porphyry copper style mineralization are related to Cretaceous (?) Carmacks (?) age granodiorite intrusions aligned in an approximate E-W direction.

Madrona Mining Limited acquired its ground in the Sixtymile area at the head of Glacier Creek for potential volcanic massive sulphide deposits similar to those found in the Yukon Tanana Terrane in the Finlayson Lake area (Marchand, 1997). To date only minor showings of sphalerite and galena have been found within the Nasina assemblage in the Sixtymile area.

## 2.1 Surficial Geology

The Sixtymile placer district lies within the Klondike Plateau (Duk-Rodkin, 1996). Dendritic 'V' shaped valleys dissect the plateau reflecting its largely unglaciated state. An exception is the Sixtymile River valley which has been glaciated as shown by the presence of small lateral moraines.

The surficial geology is best summarized by Hughes, et al, (1986) as follows.

> Quaternary deposits of the Sixtymile river drainage basin include valley bottom alluvial plains and terraces, gulch alluvium, colluvial veneers and blankets, and scattered debris flows. The youngest Quaternary deposits include active colluvium, valley bottom gulch alluvium and the broad alluvial plain in the Sixtymile River valley. Older alluvial deposits include the higher terrace levels in the upper reaches of Miller and Glacier Creeks, the second terrace in the lower reaches of Miller Creek, and the broad terrace found on the north side of the Sixtymile River valley, both upstream and downstream from Miller Creek.

Colluvium veneer is the most common cover on the hillsides, averages 1-2m thick while colluvium blanket material, averages >3m thick. Colluvium conforms to bedrock topography and is composed of diamicton, rubble, and organic-rich silt and sand derived from bedrock sources by a variety of slope processes.

Valleys are filled with alluvium and locally form terraces up to 20m thick. The alluvium plain in the Sixtymile Valley averages only <5m – 8m thick and forms a uniform sheet across the valley. Most of the Toni 9-14,27,28 claims are underlain by the above alluvium that has mostly been processed by placer miners.

The central portion the claim block on the southeast side (field stations RH07195 – 197) is underlain by overburden, abundant permafrost and possible glacial till or lateral moraine material.

## 3.0 PROPERTY GEOLOGY

Where it can be determined various units of the Carmacks Group volcanics, predominantly of andesite composition, underlie the Sixtymile River valley (Figure 3). Much of the geology shown on Figures 3, 4 and 6 is derived from the geological data collected at the field stations with most contacts being extrapolated from aeromagnetic data collected by Kennecott Exploration Inc. (Hulstein and Zuran, 1999).

Where exposed on the hillsides to the northeast of the claims the Late Cretaceous Carmacks Group volcanic rocks are comprised of: blocky to sub-blocky, grey, rusty brown and purplish weathering porphyritic andesite and rare dacite (?); massive irregular, rusty brown weathering, pyroclastic monolithic block flow porphyritic andesite; and irregular grey brown weathering andesitic crystal tuff (?). Mineralogy consists of medium to coarse-grained phenocrysts of plagioclase, lesser hornblende, in a fine-grained groundmass. Andesite blocks within the pyroclastic andesites are sub-angular and average 20cm across in size. The andesitic crystal tuff is very magnetic.

Altered and faulted volcanic flow andesites and rarer breccias are exposed sporadically within abandoned and active placer pits in the Sixtymile River valley. Geological contacts with other units have not been observed in outcrop; nevertheless, the Carmacks volcanic rocks are interpreted as resting non-conformably over fluvial quartz-pebble conglomerate, Nasina and/or Klondike Assemblages.

The bounding Sixtymile fault juxtaposes the down dropped and preserved Carmacks volcanics on the northeast side against the metamorphic rocks of the Nasina Assemblage to the southeast. Complications to this simplified scenario are indicated by outcropping siliciclastic gneissic rocks on the northeast side of the fault (fieldstation RH07188) and aeromagnetic patterns that cross the projected trace of the fault. These quartz-feldspar gneissic rocks and similar gneissic to schistose rocks found adjacent to the projected Sixtymile fault differ from the more biotite-muscovite rich schists found further to the southeast (i.e. soil sample site RH07S012 and RH07S017). Small outcroppings and float of quartz pebble conglomerate and white sandstone found on or very near the projected trace of the Sixtymile Fault are believed to be preserved basal remnants of the Carmacks Group (near soil sample sites (RH07S011 and RH07S019).

### 3.1 Alteration and Mineraization

Alteration and mineralization in the Sixtymile River valley is poorly understood due to alluvial cover, now consisting mostly of placer tailings. Placer gold, with an estimated production of 338,682 crude ounces, has been mined extensively in the Sixtymile River valley, Miller, Glacier, Poker (US side), Little Gold and Bedrock Creeks in the vicinity of the Toni 9-28 claims (LeBarge, 2006). The source of most of this gold is unknown but according to Mortenson et al. (2006) is likely derived from metamorphogenic rather than epithermal veins.

Alteration of the Carmacks Group andesitic volcanics in the valley, associated with hydrothermal activity, is assumed to have taken place during the Cretaceous intrusive event. Hydrothermal alteration is comprised of two styles: 1), silicification (includes both quartz-carbonate-kaolinite and quartz-phengite-adularia zones of Glasmacher and Freidrich, 1992) and 2), carbonate-pyrite altered volcanic rocks. Mineralogy of silification type is commonly manifested by clay minerals, sericite, bleaching, and silica flooding (quartz). Alteration appears to be more intense where the andesites have been brecciated, although it has not been determined at present if brecciation is due to hydrothermal or volcanic processes or both. Angular bleached clasts of psammites – quartzites have been noted within silicified vein-breccia material. The carbonate alteration consists of Ca-Mg-Fe carbonate minerals (calcite, ankerite and dolomite) +/- quartz and up to 5% coarse grained pyrite. Propylitic alteration (increased chlorite, rare epidote) is often coincident with the iron carbonate alteration.

Along the projected trace of the Sixtymile fault the andesites (?) are fine grained, feldspar phyric and variably propylitic to phyllic altered and bleached. Locally the andesites are altered to a light grey gouge material (soil sample site RH07S010). In the same area the quartz pebble conglomerates have a yellow coloured - limonite matrix, weather the same colour and have trace pyrite on fractures.

The siliclastic gneisses at field station RH07188 weather a light (bleached?) tan – limonite colour, are weakly altered with minor clay – sericite and have trace pyrite on fractures. Rare quartz veinlets of mm scale were observed cutting the gneiss. At other locations near the projected trace of the bounding Sixtymile fault (soil sample sites RH07S007 and RH07S011) the gneissic rocks weather with a prominent limonite – hematite coating.

Significant alteration and mineralization was not observed in the southeast corner of the property although the projected trace of the Sixtymile fault is believed to be covered by black muck and permafrost where it crosses the northwest trending ridge spur (field stations RH07192 & 193).

Argillic-altered andesite is found locally in the Sixtymile River valley and the placer miners have noted 'extensive' clay rich bedrock areas that hindered placer mining (Frank Hawker and Mike McDougall, pers. comm., 2003). Disseminated and thin veinlet type mineralization in propylitic and argillic altered andesite includes up to 5% disseminated pyrite cubes associated with chalcedony, ankerite, dolomite, calcite veinlets +/- trace galena, sphalerite and molybdendite.

Glasmacher and Freidrich (1992) note that the mineralization drilled by Klondike Gold Corporation (Per occurrence, Yukon Minfile no. 115N 041) and the Glasmacher occurrence located on the Toni 9-14 claims (Yukon Minfile no. 116C 153), was formed in the upper parts of the same fossil geothermal system, likely associated with the Late Cretaceous magmatism. They also postulated that the differences between the two occurrences (Per has more sulfides) is due to different mixing environments of two fluid types; a near surface low temperature groundwater (150$^0$C) fluid and a high temperature alkaline-chloride (260$^0$C) fluid. Glasmacher and Freidrich (1992) noted four stages of mineral enrichment, due in part, to the mixing of the two fluid types, boiling of the fluids (boiling more important at the Glasmacher occurrence) and fluid wall rock interactions. Glasmacher and Freidrich (1992) classify both occurrences as gold-bearing epithermal volcanic-hosted occurrences of the quartz-adularia type, typical of areas with calc-alkaline volcanic rocks of andesitic to dacitic composition.

The Glasmacher occurrence has been described as a gold bearing pyrite-arsenopyrite occurrence with quartz – sulphide grading up to 12 gpt gold (Glasmacher and Freidrich, 1992). Mineralization is described as gold and silver bearing sulphides found disseminatied, in stockwork and as vein type sulphides, all in Carmacks Group volcanic rocks. At present the occurrence is covered by placer mined alluvium.

The Per Yukon Minfile (2003) occurrence, located approximately 4 km to the SW of the Glasmacher occurrence, is described as a northeast trending, 8 cm to 60 cm wide, galena-sphalerite-arsenopyrite vein with a strike length of 61 m. Drilling on the Per intersected mineralized quartz veining that contained 11.522 g/t gold over 4.5 m (including 42.167 g/t over 1.5m) within a larger interval of 7.1 g/t gold over 12 m.

### 3.2 Structure

The prominent structural element in the area of the Tony 1-14 claims is the Sixtymile Lineament in the Sixtymile River valley (Figure 3). Paralleling structures to the northwest of the Sixtymile Lineament are interpreted to be a series of normal faults. These normal faults in turn are believed to have been displaced by Tintina related (?) northwest trending faults and associated Reidel (?) faults (Hulstein and Zuran, 1999). They describe a disjointed 'Miller Structural Corridor' that may be a more prominent Tintina related structure cutting through

relatively more brittle siliceous metasedimentary rocks. The NE trending Sixtymile fault shown on Figures 3, 4 and 6 is derived from Mortenson (1996), field mapping and interpretation from the Kennecott aeromagnetic survey (described in; Geophysics 5.0).

The NE trending faults that comprise the Sixtymile Lineament are believed to be related to stress transfer between the NW striking Denali and and Tintinta transcurrent fault systems (Lowe and Cassidy, 1995). The extensional tectonics that formed the graben, allowing the preservation of the Carmacks Group in the Sixtymile Valley, is likely due to right-handed step-overs across dextral strike-slip fault systems (Lowe and Cassidy, 1995)

Glasmacher (1992) describes how both the Per and Glasmacher occurrences are structurally controlled and are found at the junction of three major fault systems: the ENE-WSW trending Sixtymile River fault zone, a NW-SE trending fault zone and a NE –SW trending fault zone. He states that between these two occurrences, small NE-SW trending quartz-(carbonate)-sulphide veinlets crosscut the Carmacks volcanic rocks that underlie the Sixtymile River valley.

Significant vertical displacement on the Sixtymile fault, in the order of 100's of m, is indicated by thin sedimentary units of basal Carmacks Group preserved on the projected trace of the fault.

## 4.0 GEOCHEMISTRY

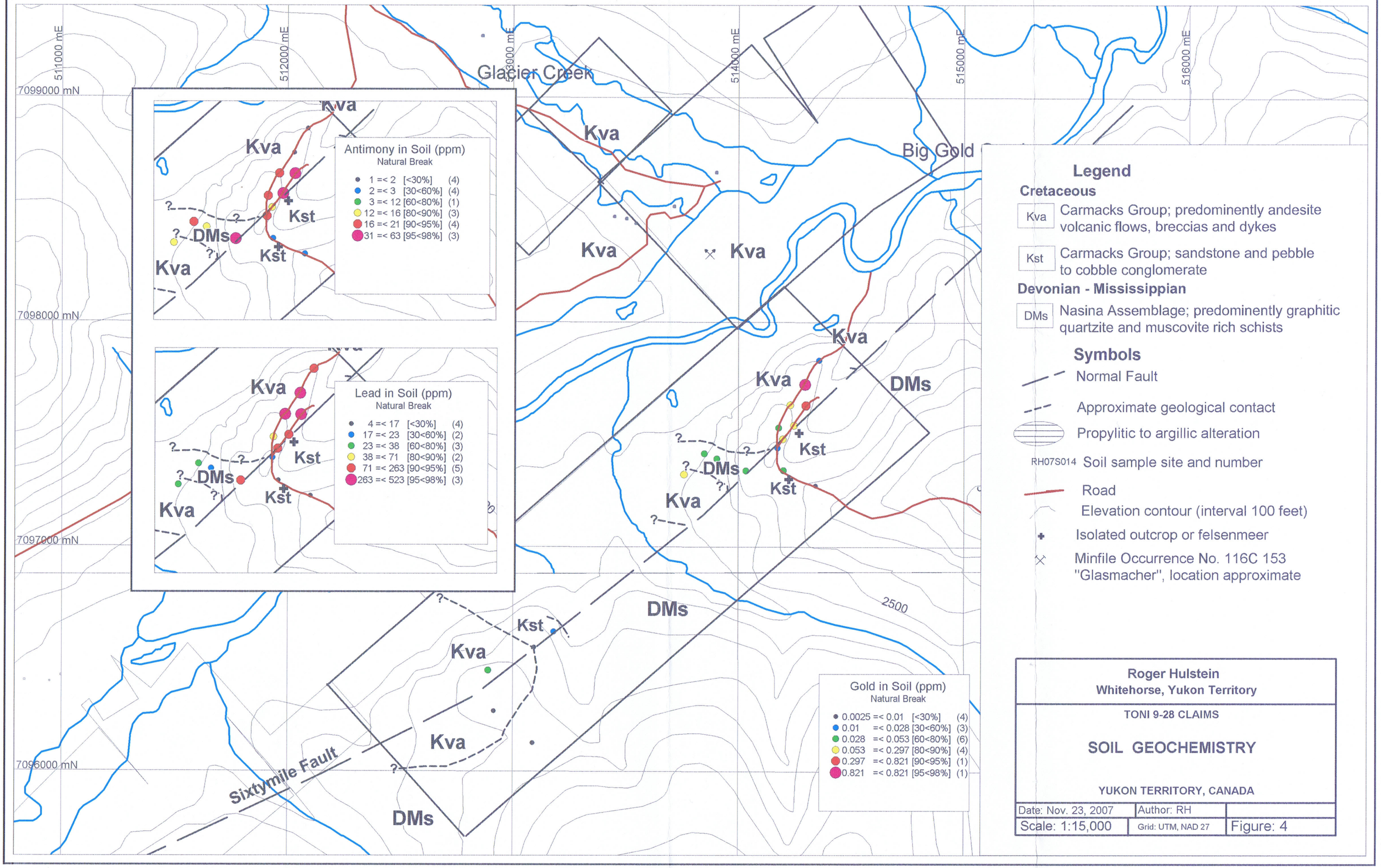
Geochemical sample analysis in 2007 was carried out by ALS Chemex of North Vancouver, B.C. All rock samples were analyzed for gold by having a pulverized 50 gram sub sample fire assayed and a gold determination made by atomic absorption. An additional 34 elements were analyzed by aqua regia ICP-AES. Mercury was analyzed by cold vapor and atomic absorption spectrometry. The analytical certificate is presented in Appendix A and sample descriptions and analytical results in Appendix B. Rock sample locations are shown on Figure 3.

A total of 19 soil samples collected from the property were submitted for geochemical analysis. Samples were collected by soil auger if significant soil was present or by grub hoe (Geo-Tul) if the ground was rocky. Care was taken to avoid loess and organics and soil not in situ (placer tailings, glacial or stream deposited material). Soils were collected in two lines that attempted to cross the suspected trace of the bounding Sixtymile fault. Samples were also collected along or near the fault where an old bulldozer road exposed altered rocks (samples RH07S005 – S010).

The highest gold value returned in 2007 was 0.821 ppm Au (sample RH07S005) from a soil sample described as "limonite brown soil, likely decomposed andesite". It was collected on the bulldozer road at a depth of 0.4 m near the projected trace of the Sixtymile fault. This same sample also contained; 2.4 ppm Ag, 50 ppm As, 12 ppm Bi, 293 ppm Pb, 1205 ppm Zn. Other samples collected along the road over altered andesite and gneiss-schist talus returned anomalous values for gold (5 samples between 0.039-0.297 ppm) and similar Ag, As, Pb and Zn values, as in sample RH07S005), plus up to 315 ppm Cu, 526 ppm Mo, 40 ppm Sb and 0.20 ppm Hg.

Due to the small sample population statistical analysis was not undertaken. However based on the authors experience in the area, the above values are believed to be part of an anomalous data set. Taken together these anomalous samples extend over a NE – SW distance of approximately 500 m, more or less parallel to the Sixtymile fault structure.

Soil sampling in the central SE and SE portion of the property was hindered by permafrost and lack of suitable soil. As such these areas cannot be considered to have been tested by soil geochemistry as the sample quality was often poor and overall coverage is very incomplete.


511000 mE
512000 mE
513000 mE
514000 mE
515000 mE
516000 mE
7099000 mN
7098000 mN
7097000 mN
7096000 mN
Glacier Creek
Big Gold
Kva
Kst
DMs
Sixtymile Fault
2500
Antimony in Soil (ppm)
Natural Break
1 =< 2 [<30%] (4)
2 =< 3 [30<60%] (4)
3 =< 12 [60<80%] (1)
12 =< 16 [80<90%] (3)
16 =< 21 [90<95%] (4)
31 =< 63 [95<98%] (3)
Lead in Soil (ppm)
Natural Break
4 =< 17 [<30%] (4)
17 =< 23 [30<60%] (2)
23 =< 38 [60<80%] (3)
38 =< 71 [80<90%] (2)
71 =< 263 [90<95%] (5)
263 =< 523 [95<98%] (3)
Gold in Soil (ppm)
Natural Break
0.0025 =< 0.01 [<30%] (4)
0.01 =< 0.028 [30<60%] (3)
0.028 =< 0.053 [60<80%] (6)
0.053 =< 0.297 [80<90%] (4)
0.297 =< 0.821 [90<95%] (1)
0.821 =< 0.821 [95<98%] (1)
Legend
Cretaceous
Kva Carmacks Group; predominently andesite volcanic flows, breccias and dykes
Kst Carmacks Group; sandstone and pebble to cobble conglomerate
Devonian - Mississippian
DMs Nasina Assemblage; predominently graphitic quartzite and muscovite rich schists
Symbols
Normal Fault
Approximate geological contact
Propylitic to argillic alteration
RH07S014 Soil sample site and number
Road
Elevation contour (interval 100 feet)
Isolated outcrop or felsenmeer
Minfile Occurrence No. 116C 153 "Glasmacher", location approximate
Roger Hulstein
Whitehorse, Yukon Territory
TONI 9-28 CLAIMS
SOIL GEOCHEMISTRY
YUKON TERRITORY, CANADA
Date: Nov. 23, 2007
Author: RH
Scale: 1:15,000
Grid: UTM, NAD 27
Figure: 4

## 5.0 GEOPHYSICS

In 2007 a ground magnetic survey was carried out over the reported area of the Glasmacher occurrence (Yukon Minfile, 2003) (Figure 5). A GEM systems GSM-19T proton precession magnetometer rented from Ryanwood Exploration Inc. in Dawson City, Yukon was utilized. A Garmin GPSmap 60CSx GPS was used for control. Lines were oriented northwest at a nominal spacing of 50 m and stations were ideally 10 m apart. A total of 812 data points were obtained covering an area approximately 400 m X 900 m. Magnetic values vary between 56248 nano-Tesla and 58095 nanoTesla. The highest values, from the southeast side of the grid, are presumably underlain by 'fresh' magnetite bearing andesites although no outcrop was noted in the immediate area.

The time on the GPS and magnetometer were synchronized (to "Zulu" time) allowing positions to be extracted from the GPS automatic track log that recorded a station every 10 seconds. GPS stations at the end of lines were also collected for further control (Stations 1-40, on Figure 3). Magnetometer instrumentation parameters are given in Appendix C. Corrected survey data is available digitally in a Microsoft Excel file in Appendix D. Approximately one third of the data was corrected for diurnal variation using the GEM systems GSM-19T proton precession magnetometer base station. Due to an error operating the base station the other two thirds of the data was corrected for diurnal variation using data collected at Eagle, Alaska by The Geophysical Institute of the University of Alaska (website: http://magnet.gi.alaska.edu/).

Results from the 2007 ground magnetic survey confirm that the reported location of the Glasmacher occurrence lies within a magnetic low, the same results obtained by the 1999 helicopter borne magnetic survey (Figure 6). The magnetic variations observed in the survey are likely related to the presence or absence of magnetite in the variably altered andesite volcanic rocks. Altered andesite is virtually nonmagnetic while fresher andestite contains appreciable magnetite. The northeast trending low values on the east side of the grid are likely due to alteration along structures parallel to the regional Sixtymile fault – lineament. The northwest side of the grid has slightly higher values and indeed, based on float turned up by the dredges, the andesite is less altered in this area. Of possible significance is the approximate east – west 'break' between the magnetic low and the higher values to the (north) west.

In 1999 Kennecott Canada Exploration Inc. contracted High-Sense Limited of Toronto to fly a magnetic and radiometric survey over their entire property which at the time included the Toni 9-28 claims (Hulstein and Zuran, 1999). Flight lines were oriented north-south, spaced 200m apart with a nominal sensor height of 50m above the surface (Figure 6). The geology shown on Figures 3, 4 and 6 are derived in part from the geology data collected at the field stations with most contacts being extrapolated using the Kennecott aeromagnetic data.

7099000 mN

7098500 mN

7098000 mN

513500 mE

514000 mE

514500 mE

Big Gold Creek

Glacier Creek

Sixtymile River

N

Total Field Magnetics
nT
- 57,990
- 57,180
- 57,090
- 57,020
- 56,250

## Legend

- Minfile Occurrence No. 116C153 "Glasmacher", location approximate
- Ground magnetometer survey station
- Property perimeter
- Road

Scale: 1:5,000

0 50 100 150 250 500

metres

**Roger Hulstein**
**Whitehorse, Yukon Territory**

**TONI 9-28 CLAIMS**

# GROUND MAGNETICS TOTAL FIELD (nT)

**YUKON TERRITORY, CANADA**

| | | |
|---|---|---|
| Date: Nov. 23, 2007 | Author: RH | |
| Scale: 1:5,000 | Grid: UTM, NAD 27 | Figure: 5 |

511000 mE
512000 mE
513000 mE
514000 mE
515000 mE
516000 mE
7099000 mN
7098000 mN
7097000 mN
7096000 mN
2500
3000

Glacier Creek
Glacier Creek
Big Gold Creek
Big Gold Creek
Sixty Mile River
Sixty Mile River
Toni 9-28 Claim Perimeter
Sixtymile Fault

Kva
Kst
DMs
?

N

## Legend

**Cretaceous**

Kva — Carmacks Group; predominently andesite volcanic flows, breccias and dykes

Kst — Carmacks Group; sandstone and pebble to cobble conglomerate

**Devonian - Mississippian**

DMs — Nasina Assemblage; predominently graphitic quartzite and muscovite rich schists

## Symbols

- Normal Fault
- Approximate geological contact
- Propylitic to argillic alteration
- RH07S014 Soil sample site and number
- Road
- Elevation contour (interval 100 feet)
- Isolated outcrop or felsenmeer
- Minfile Occurrence No. 116C 153 "Glasmacher", location approximate

Gold in Soil (ppm)
Natural Break

| | | | |
|---|---|---|---|
| 0.0025 | =< 0.01 | [<30%] | (4) |
| 0.01 | =< 0.028 | [30<60%] | (3) |
| 0.028 | =< 0.053 | [60<80%] | (6) |
| 0.053 | =< 0.297 | [80<90%] | (4) |
| 0.297 | =< 0.821 | [90<95%] | (1) |
| 0.821 | =< 0.821 | [95<98%] | (1) |

Legend
57535.5
57478.4
57459.9
57448.3
57437.0
57425.6
57415.1
57405.6
57395.2
57387.4
57381.6
57375.3
57368.4
57361.0
57352.8
57342.0
57328.8
57313.1
57297.1
57250.6
TMI
nTesla

Note: Aeromagnetic image from Yukon Assessment Report 0940554.

**Roger Hulstein**
**Whitehorse, Yukon Territory**

**TONI 9-28 CLAIMS**

# AEROMAGNETICS TOTAL FIELD (nT)

**YUKON TERRITORY, CANADA**

| | | |
|---|---|---|
| Date: Nov. 23, 2007 | Author: RH | |
| Scale: 1:15,000 | Grid: UTM, NAD 27 | Figure: 6 |

Overall the magnetic variation in the aeromagnetic survey was less than 300nT (nanoTesla) with the Carmacks volcanics appearing as a mottled magnetic high-low signature. A sharp contrast in the magnetic signature denotes the suspected location of the northeast trending bounding Sixtymile fault. As with the ground magnetic survey, most of the magnetic variability is over the areas underlain by andesite and can be attributed to the degree of alteration with magnetic lows possibly indicating hydrothermal alteration. A good example of this is the area between soil samples RH07S002 and RH07S006 where alteration decreases going towards RH07S007 which is situated in 'fresh' highly magnetic andesite. A semicircular magnetic high zone straddles the projected trace of the Sixtymile fault in the southern portion of the claim block indicating that the fault is either drawn incorrectly, later magnetic andesties cover or intrude along the fault or the fault is offset. At this time it is not clear which possibility, if any, is correct.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

The 2007 work program returned eight soil samples anomalous in gold (>0.28 ppm to < 0.821 ppm). These samples are located over and about the projected trace of the Sixtymile fault for a distance of approximately 500 m. In addition to gold a number of the soil samples in the same area also yielded anomalous values for; Ag, As, Bi, Cu, Mo, Pb, Sb and Zn. These anomalous values may indicate the nearby presence of significant epithermal vein type mineralization.

The Sixtymile fault, a regional fault, part of the Sixtymile Lineament, trends northeasterly, bounds the down dropped and variably altered intermediate Carmacks Group volcanics on the northwest against the metamorphic Nasina Group rocks to the southeast. The rocks in this area are variably altered, clay gouge like material being noted, but not visibly mineralized. The anomalous soil samples reported above lie on the margin of a strong aeromagnetic high associated with magnetite bearing andesite.

The approximately 400 m by 900 m ground magnetic survey over the reported location of the Glasmacher occurrence shows that it likely lies within a magnetic low that trends approximately E-W for at least 500 m and is about 300 m wide. This corresponds closely to the aeromagnetic low reported by Hulstein and Zuran (1999).

The 2007 results along with previous work by Glasmacher (1984) in the Sixtymile valley indicate the presence of a significant precious metal bearing epithermal system. Gold mineralization has been found in the Sixtymile Valley by previous workers, the Glasmacher and Per occurrences and is indicated along the Sixtymile fault. Based on this additional work is warranted and recommended.

Given the fact that the Glasmacher occurrence is covered by placer mined gravels, geophysical methods such as electromagnetics, induced polarization and VLF in addition to more magnetic surveys are recommended. Anomalous areas (magnetic lows, conductors) should then be trenched or tested by pits as the mined alluvial cover is not very deep (often <5m), based on trenching on the claims located upstream. A geophysicist should be consulted in the planning stages of the next geophysical program to determine the best approach.

Additional mapping, prospecting and soil sampling is recommended in the area of the Sixtymile fault from where the anomalous soil samples were returned in 2007. The 2007 ground magnetic survey should be extended to cover the area of anomalous soil samples and the suspected trace of the Sixtymile fault. A magnetic susceptibility meter should be used to correlate the degree of magnetism observed in outcrop with the airborne and ground magnetic surveys.

All of the above work should be directed towards defining targets for a diamond drill program.

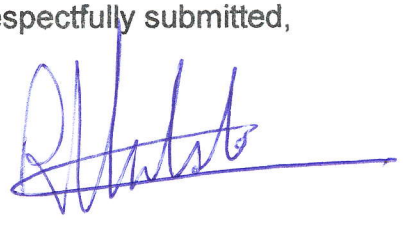
## 7.0 STATEMENT OF COSTS

The following costs were incurred on the Toni 9-28 claims in 2007.

**TONI 9-28 CLAIMS, NTS: 115N/15, 116C/2**
**2007 Assessment Costs**

| | | | | |
|---|---|---|---|---|
| **Geochemistry** | | | | |
| | No. | $/Sample | $Subtotal | |
| Soil Samples | 19 | 36.44 | 692.36 | |
| | | | | **$692.36** |
| **Personnel (2006)** | | | | |
| | Days | Daily Rate | Subtotal | |
| R.Hulstein, B.Sc,P.Geo. (geologist) | | | | |
| June 25-28, 2007 | 4 | 500.00 | 2,000.00 | |
| Total Labour Costs | | | | **$2,000.00** |
| **Field Expenses** | | | | |
| | | Rate/item | | |
| Freight | | 21.52 | 21.52 | |
| Meals and Accommodation | | 110.49 | 110.49 | |
| Vehicle Rental | 4 | 100.00 | 400.00 | |
| Fuel (for vehicle) | | 215.37 | 215.37 | |
| Communications | 4 | 10.00 | 40.00 | |
| Magnetometer Rental | 3 | 120.00 | 360.00 | |
| Total Field Costs | | | | **$1,147.38** |
| **Report and Project Management** | | | | |
| Person | | | | |
| R. Hulstein | 2 | 500.00 | 1,000.00 | |
| Drafting & Reproduction | | | 25.00 | |
| Total Report Costs | | | | **$1,025.00** |
| **Total Project Cost** | | | | **$4,864.74** |

Respectfully submitted,



December 4, 2007

Roger Hulstein, B.Sc., P.Geo.

## 8.0 STATEMENT OF QUALIFICATIONS

I, Roger W. Hulstein, of:

106 Wilson Drive
Whitehorse, Yukon Territory
Y1A 5R2,

do hereby certify that:

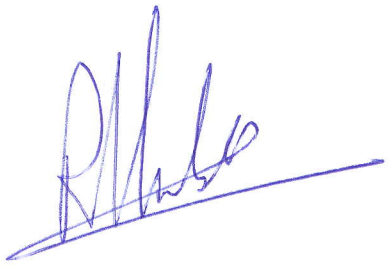
1. I am a mineral exploration geologist with over 20 years of experience working in the Yukon.

2. I am a graduate of Saint Mary's University, Halifax, with a degree in geology (B.Sc., 1981) and have been involved in geology and mineral exploration continuously since 1978.

3. I am a fellow of the Geological Association of Canada (F3572).

4. I am registered as a professional geoscientist (No. 19127) with the Association of Professional Engineers and Geoscientists of the Province of British Columbia.

5. I am the author of this report on the Toni 9-28 claims in the Dawson Mining District, Yukon. The report is based on personal examination of the ground on various dates, with the last work carried out at various times on June 25-28th, 2007 and on referenced sources.



Roger Hulstein, B.Sc., FGAC, P.Geo.

December 4, 2007

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# Appendix A

# Analytical Certificate

**ALS Chemex**
***EXCELLENCE IN ANALYTICAL CHEMISTRY***
ALS Canada Ltd.
212 Brooksbank Avenue
North Vancouver BC V7J 2C1
Phone: 604 984 0221 Fax: 604 984 0218 www.alschemex.com

To: **HULSTEIN, ROGER**
**106 WILSON DR.**
**WHITEHORSE YT Y1A 5R2**


**Finalized Date: 21-JUL-2007**
This copy reported on 5-DEC-2007
**Account: HULROG**

## CERTIFICATE VA07073489

Project: 60 mile

P.O. No.:

This report is for 19 Soil samples submitted to our lab in Vancouver, BC, Canada on 11-JUL-2007.

The following have access to data associated with this certificate:

ROGER HULSTEIN

## SAMPLE PREPARATION

| ALS CODE | DESCRIPTION |
|---|---|
| WEI-21 | Received Sample Weight |
| LOG-22 | Sample login - Rcd w/o BarCode |
| SCR-41d | Screen to -100um, save both |

## ANALYTICAL PROCEDURES

| ALS CODE | DESCRIPTION | INSTRUMENT |
|---|---|---|
| Hg-CV41 | Trace Hg - cold vapor/AAS | FIMS |
| Au-AA24 | Au 50g FA AA finish | AAS |
| ME-ICP41 | 35 Element Aqua Regia ICP-AES | ICP-AES |

To: **HULSTEIN, ROGER**
**106 WILSON DR.**
**WHITEHORSE YT Y1A 5R2**

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

**Signature:** 

Lawrence Ng, Laboratory Manager - Vancouver

**ALS Chemex**
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North Vancouver BC V7J 2C1
Phone: 604 984 0221 Fax: 604 984 0218 www.alschemex.com

To: **HULSTEIN, ROGER**
**106 WILSON DR.**
**WHITEHORSE YT Y1A 5R2**


**Finalized Date: 21-JUL-2007**
**Account: HULROG**

Project: 60 mile

## CERTIFICATE OF ANALYSIS VA07073489

| Sample Description | Method / Analyte / Units / LOR | WEI-21 Recvd Wt. kg 0.02 | Au-AA24 Au ppm 0.005 | ME-ICP41 Ag ppm 0.2 | ME-ICP41 Al % 0.01 | ME-ICP41 As ppm 2 | ME-ICP41 B ppm 10 | ME-ICP41 Ba ppm 10 | ME-ICP41 Be ppm 0.5 | ME-ICP41 Bi ppm 2 | ME-ICP41 Ca % 0.01 | ME-ICP41 Cd ppm 0.5 | ME-ICP41 Co ppm 1 | ME-ICP41 Cr ppm 1 | ME-ICP41 Cu ppm 1 | ME-ICP41 Fe % 0.01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RH07S001 | | 0.28 | 0.017 | 0.8 | 1.93 | 57 | <10 | 200 | <0.5 | <2 | 0.05 | <0.5 | 3 | 54 | 140 | 5.48 |
| RH07S002 | | 0.32 | 0.024 | 0.8 | 2.16 | 60 | <10 | 210 | <0.5 | <2 | 0.07 | <0.5 | 5 | 58 | 102 | 5.39 |
| RH07S003 | | 0.48 | 0.028 | 1.9 | 2.00 | 29 | <10 | 140 | <0.5 | <2 | 0.06 | <0.5 | 5 | 27 | 159 | 6.78 |
| RH07S004 | | 0.48 | 0.053 | 1.2 | 2.07 | 54 | <10 | 360 | 0.9 | <2 | 0.06 | <0.5 | 13 | 24 | 173 | 7.98 |
| RH07S005 | | 0.44 | 0.821 | 2.4 | 3.72 | 50 | <10 | 220 | 2.6 | 12 | 0.33 | 1.2 | 25 | 19 | 120 | 12.8 |
| RH07S006 | | 0.46 | 0.010 | <0.2 | 3.00 | 11 | <10 | 120 | 1.2 | <2 | 0.27 | <0.5 | 18 | 23 | 56 | 6.20 |
| RH07S007 | | 0.46 | 0.012 | 0.8 | 1.57 | 32 | <10 | 270 | <0.5 | 2 | 0.08 | <0.5 | 6 | 32 | 22 | 4.09 |
| RH07S008 | | 0.40 | 0.039 | 2.1 | 1.58 | 50 | <10 | 570 | <0.5 | <2 | 0.10 | <0.5 | 5 | 25 | 90 | 3.88 |
| RH07S009 | | 0.40 | 0.297 | 4.6 | 1.13 | 263 | <10 | 90 | 0.7 | 3 | 0.16 | <0.5 | 5 | 17 | 212 | 8.43 |
| RH07S010 | | 0.40 | 0.039 | 1.2 | 0.57 | 52 | <10 | 80 | <0.5 | 2 | 0.16 | <0.5 | 6 | 67 | 269 | 8.80 |
| RH07S011 | | 0.40 | 0.019 | 0.3 | 1.67 | 18 | <10 | 100 | <0.5 | <2 | <0.01 | <0.5 | 1 | 85 | 315 | 8.87 |
| RH07S012 | | 0.38 | <0.005 | <0.2 | 1.98 | 18 | <10 | 270 | 1.2 | <2 | 2.55 | <0.5 | 25 | 146 | 45 | 5.44 |
| RH07S013 | | 0.42 | 0.029 | 3.4 | 0.58 | 160 | <10 | 80 | <0.5 | 25 | 0.01 | <0.5 | <1 | 24 | 35 | 6.11 |
| RH07S014 | | 0.38 | 0.055 | 0.8 | 1.62 | 65 | <10 | 270 | <0.5 | 2 | 0.10 | <0.5 | 5 | 43 | 150 | 5.16 |
| RH07S015 | | 0.42 | 0.022 | 2.0 | 1.41 | 17 | <10 | 450 | 1.4 | 5 | 0.90 | <0.5 | 15 | 42 | 128 | 5.70 |
| RH07S016 | | 0.36 | 0.006 | 0.2 | 2.48 | 7 | <10 | 310 | 0.9 | <2 | 0.59 | <0.5 | 14 | 29 | 42 | 4.80 |
| RH07S017 | | 0.34 | <0.005 | <0.2 | 1.96 | 8 | <10 | 300 | 0.5 | <2 | 0.48 | <0.5 | 9 | 35 | 32 | 3.09 |
| RH07S018 | | 0.40 | 0.005 | 2.3 | 1.14 | 62 | <10 | 170 | <0.5 | 5 | 0.14 | 1.6 | 5 | 14 | 61 | 2.89 |
| RH07S019 | | 0.36 | 0.010 | 0.3 | 0.77 | 18 | <10 | 120 | <0.5 | 2 | 0.03 | <0.5 | 2 | 11 | 15 | 2.59 |

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To: **HULSTEIN, ROGER**
**106 WILSON DR.**
**WHITEHORSE YT Y1A 5R2**


**Finalized Date: 21-JUL-2007**
**Account: HULROG**

Project: 60 mile

## CERTIFICATE OF ANALYSIS VA07073489

| Sample Description | Method / Analyte / Units / LOR | ME-ICP41 Ga ppm 10 | Hg-CV41 Hg ppm 0.01 | ME-ICP41 K % 0.01 | ME-ICP41 La ppm 10 | ME-ICP41 Mg % 0.01 | ME-ICP41 Mn ppm 5 | ME-ICP41 Mo ppm 1 | ME-ICP41 Na % 0.01 | ME-ICP41 Ni ppm 1 | ME-ICP41 P ppm 10 | ME-ICP41 Pb ppm 2 | ME-ICP41 S % 0.01 | ME-ICP41 Sb ppm 2 | ME-ICP41 Sc ppm 1 | ME-ICP41 Sr ppm 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RH07S001 | | 10 | 0.05 | 0.35 | 10 | 0.39 | 168 | 53 | 0.02 | 9 | 340 | 23 | 0.50 | 21 | 6 | 17 |
| RH07S002 | | 10 | 0.05 | 0.39 | 10 | 0.49 | 218 | 48 | 0.02 | 12 | 330 | 19 | 0.46 | 13 | 6 | 17 |
| RH07S003 | | 10 | 0.02 | 0.54 | 20 | 0.27 | 169 | 76 | 0.05 | 12 | 1000 | 51 | 1.13 | 18 | 3 | 31 |
| RH07S004 | | <10 | 0.03 | 0.39 | 30 | 0.31 | 279 | 22 | 0.05 | 16 | 1330 | 263 | 0.80 | 17 | 3 | 80 |
| RH07S005 | | 10 | 0.01 | 0.42 | 40 | 1.54 | 1245 | 10 | 0.03 | 3 | 3070 | 293 | 0.30 | <2 | 12 | 184 |
| RH07S006 | | 10 | 0.02 | 0.06 | 10 | 0.37 | 1960 | 3 | 0.01 | 13 | 1590 | 80 | 0.02 | <2 | 17 | 14 |
| RH07S007 | | <10 | 0.03 | 0.30 | 10 | 0.30 | 203 | 5 | 0.01 | 14 | 230 | 17 | 0.54 | 16 | 4 | 15 |
| RH07S008 | | <10 | 0.03 | 0.24 | 10 | 0.38 | 157 | 22 | 0.02 | 13 | 480 | 117 | 0.42 | 31 | 3 | 26 |
| RH07S009 | | <10 | 0.03 | 0.98 | 20 | 0.28 | 209 | 12 | 0.06 | 6 | 1440 | 523 | 2.03 | 40 | 4 | 71 |
| RH07S010 | | <10 | 0.03 | 0.88 | 30 | 0.08 | 147 | 526 | 0.02 | 13 | 670 | 71 | 1.94 | 12 | 12 | 38 |
| RH07S011 | | 10 | 0.01 | 1.19 | 10 | 0.48 | 98 | 12 | 0.02 | 5 | 680 | 4 | 2.03 | 2 | 18 | 14 |
| RH07S012 | | 10 | 0.20 | 0.43 | 60 | 1.35 | 685 | 1 | 0.02 | 79 | 1790 | 12 | 0.03 | 2 | 15 | 79 |
| RH07S013 | | 10 | 0.01 | 1.01 | 20 | 0.05 | 24 | 74 | 0.02 | 4 | 440 | 79 | 1.97 | 63 | 2 | 28 |
| RH07S014 | | <10 | 0.07 | 0.39 | 20 | 0.42 | 149 | 65 | 0.02 | 14 | 570 | 23 | 0.58 | 15 | 6 | 33 |
| RH07S015 | | <10 | 0.11 | 0.12 | 40 | 0.30 | 1600 | 5 | 0.02 | 24 | 1520 | 38 | 0.05 | 3 | 10 | 40 |
| RH07S016 | | 10 | 0.11 | 0.06 | 20 | 0.56 | 944 | 1 | 0.02 | 16 | 840 | 25 | 0.01 | 2 | 15 | 54 |
| RH07S017 | | 10 | 0.04 | 0.06 | 20 | 0.58 | 277 | 1 | 0.02 | 27 | 620 | 10 | 0.01 | <2 | 6 | 36 |
| RH07S018 | | <10 | 0.04 | 0.20 | 10 | 0.27 | 415 | 2 | 0.01 | 7 | 600 | 73 | 0.38 | 2 | 3 | 50 |
| RH07S019 | | <10 | 0.02 | 0.15 | 10 | 0.11 | 100 | 1 | 0.01 | 6 | 400 | 11 | 0.29 | <2 | 1 | 17 |

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To: **HULSTEIN, ROGER**
**106 WILSON DR.**
**WHITEHORSE YT Y1A 5R2**


**Finalized Date: 21-JUL-2007**
**Account: HULROG**

Project: 60 mile

## CERTIFICATE OF ANALYSIS VA07073489

| Sample Description | Method / Analyte / Units / LOR | ME-ICP41 Tl % 0.01 | ME-ICP41 Tl ppm 10 | ME-ICP41 U ppm 10 | ME-ICP41 V ppm 1 | ME-ICP41 W ppm 10 | ME-ICP41 Zn ppm 2 |
|---|---|---|---|---|---|---|---|
| RH07S001 | | 0.08 | <10 | <10 | 81 | <10 | 55 |
| RH07S002 | | 0.10 | <10 | <10 | 81 | <10 | 57 |
| RH07S003 | | 0.05 | <10 | <10 | 63 | <10 | 97 |
| RH07S004 | | 0.04 | <10 | <10 | 41 | <10 | 313 |
| RH07S005 | | 0.05 | <10 | <10 | 174 | <10 | 1205 |
| RH07S006 | | 0.01 | <10 | <10 | 127 | <10 | 635 |
| RH07S007 | | 0.06 | <10 | <10 | 54 | <10 | 38 |
| RH07S008 | | 0.05 | <10 | <10 | 51 | <10 | 75 |
| RH07S009 | | 0.04 | <10 | <10 | 38 | <10 | 314 |
| RH07S010 | | <0.01 | <10 | <10 | 50 | <10 | 91 |
| RH07S011 | | 0.06 | <10 | <10 | 74 | <10 | 59 |
| RH07S012 | | 0.04 | <10 | <10 | 66 | <10 | 94 |
| RH07S013 | | 0.03 | <10 | <10 | 22 | <10 | 7 |
| RH07S014 | | 0.07 | <10 | <10 | 57 | <10 | 52 |
| RH07S015 | | 0.03 | <10 | <10 | 92 | <10 | 181 |
| RH07S016 | | 0.07 | <10 | <10 | 111 | <10 | 323 |
| RH07S017 | | 0.10 | <10 | <10 | 60 | <10 | 71 |
| RH07S018 | | 0.03 | <10 | <10 | 35 | <10 | 303 |
| RH07S019 | | 0.04 | <10 | <10 | 38 | <10 | 42 |

# Appendix B

# Soil Sample Descriptions and Analytical Results

**Toni 9-28 Claims - Sixtymile River Area**
**Soil Sample Description, Location and Significant Analytical Results**
**Samples Collected by: Roger Hulstein, June 25-28, 2007**

| Name | Date | Time | Grid | Datum | Zone | Z_ltr | East | North | Elev | meter | Type | Depth cm | Quality | Note | Number | Au_ppm | Ag_ppm | Al_% | As_ppm | B_ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RH07S001 | 26-Jun-07 | 4:15:52PM | UTM | NAD27 | 7 | W | 513848 | 7097415 | 706 | m | soil | <25 | Good | Tan, minor loess, tr organics, on gneiss/schist talus slope | RH07S001 | 0.017 | 0.8 | 1.93 | 57 | -10 |
| RH07S002 | 26-Jun-07 | 4:40:01PM | UTM | NAD27 | 7 | W | 513904 | 7097393 | 741 | m | soil | <25 | Good | Tan, minor loess, tr organics, on gneiss/schist talus slope | RH07S002 | 0.024 | 0.8 | 2.16 | 60 | -10 |
| RH07S003 | 26-Jun-07 | 5:05:42PM | UTM | NAD27 | 7 | W | 514179 | 7097531 | 791 | m | soil | <25 | Good | Brown, minor loess, tr organics, float of bleached, oxidized porphyritic andesite. | RH07S003 | 0.028 | 1.9 | 2 | 29 | -10 |
| RH07S004 | 26-Jun-07 | 5:18:14PM | UTM | NAD27 | 7 | W | 514230 | 7097632 | 780 | m | soil | <25 | Good | Limonite brown - tan, located on road, bleached pyritic andesite? float | RH07S004 | 0.053 | 1.2 | 2.07 | 54 | -10 |
| RH07S005 | 26-Jun-07 | 5:31:08PM | UTM | NAD27 | 7 | W | 514296 | 7097724 | 769 | m | soil | 40 | Good | located on road, limonite brown soil, likely decomposed andesite. | RH07S005 | 0.821 | 2.4 | 3.72 | 50 | -10 |
| RH07S006 | 26-Jun-07 | 5:45:19PM | UTM | NAD27 | 7 | W | 514357 | 7097832 | 745 | m | soil | 20 | Good | Located on road, brown soil, fresh andesite float. | RH07S006 | 0.01 | -0.2 | 3 | 11 | -10 |
| RH07S007 | 26-Jun-07 | 6:06:29PM | UTM | NAD27 | 7 | W | 514174 | 7097441 | 794 | m | soil | <20 | Good | Located on road, tan soil, rocky roadbed of limonite FeOx weathered qtz-feld-schist-gneiss. | RH07S007 | 0.012 | 0.8 | 1.57 | 32 | -10 |
| RH07S008 | 26-Jun-07 | 6:20:53PM | UTM | NAD27 | 7 | W | 514246 | 7097542 | 775 | m | soil | <20 | Good | Located on road, rocky sample, float of fine grained grey siliceous volcanic, qtz pebble conglomerate with py on fractures. | RH07S008 | 0.039 | 2.1 | 1.58 | 50 | -10 |
| RH07S009 | 26-Jun-07 | 6:37:16PM | UTM | NAD27 | 7 | W | 514300 | 7097630 | 762 | m | soil | 30-40 | Good | Located on road, tan soil, wet sample, bleached andesite feldspar porphyry float. | RH07S009 | 0.297 | 4.6 | 1.13 | 263 | -10 |
| RH07S010 | 26-Jun-07 | 6:53:33PM | UTM | NAD27 | 7 | W | 514197 | 7097480 | 789 | m | soil | 70 | Good | Located on road, brown - weak orange - brown colored soil, gougy soil. | RH07S010 | 0.039 | 1.2 | 0.57 | 52 | -10 |
| RH07S011 | 26-Jun-07 | 7:11:54PM | UTM | NAD27 | 7 | W | 514200 | 7097341 | 803 | m | soil | <25 | Good | Gougy soil, located on road, sheared limonitic - hematite weathering oxidized felsic gneiss and qtz pebble conglomerate float. | RH07S011 | 0.019 | 0.3 | 1.67 | 18 | -10 |
| RH07S012 | 26-Jun-07 | 7:22:46PM | UTM | NAD27 | 7 | W | 514342 | 7097273 | 817 | m | soil | <25 | Good | On road, Muddy sample with some organics, micaceous shist. | RH07S012 | -0.005 | -0.2 | 1.98 | 18 | -10 |
| RH07S013 | 26-Jun-07 | 7:37:45PM | UTM | NAD27 | 7 | W | 514034 | 7097340 | 786 | m | soil | <25 | Good | Light tan yellow soil, rounded sand grains, weathered felsic porphyry? | RH07S013 | 0.029 | 3.4 | 0.58 | 160 | -10 |
| RH07S014 | 26-Jun-07 | 8:02:42PM | UTM | NAD27 | 7 | W | 513759 | 7097322 | 711 | m | soil | <25 | Good | Brown, rocky soil, some loess, float of felsic volcanic or bleached andesite. | RH07S014 | 0.055 | 0.8 | 1.62 | 65 | -10 |
| RH07S015 | 28-Jun-07 | 6:35:43PM | UTM | NAD27 | 7 | W | 512890 | 7096449 | 805 | m | soil | 30-40 | Good | Propylitic altered - brown weathered andesite, minor organics and loess. | RH07S015 | 0.022 | 2 | 1.41 | 17 | -10 |
| RH07S016 | 28-Jun-07 | 7:13:05PM | UTM | NAD27 | 7 | W | 512916 | 7096268 | 808 | m | soil | <25 | Good | Clay rich brown soil, brown and grey weakly propylitic andesite. | RH07S016 | 0.006 | 0.2 | 2.48 | 7 | -10 |
| RH07S017 | 28-Jun-07 | 7:35:33PM | UTM | NAD27 | 7 | W | 513087 | 7096127 | 807 | m | soil | <25 | Poor | Grey loess rich (ash?) mud. Fragments of micaceous schist. | RH07S017 | -0.005 | -0.2 | 1.96 | 8 | -10 |
| RH07S018 | 28-Jun-07 | 8:22:16PM | UTM | NAD27 | 7 | W | 513093 | 7096553 | 786 | m | soil | <25 | good-poor | Grey soil, some ash and loess, abundant andesite pebbles, variably altered (bleached, limonitic, propylitic) | RH07S018 | 0.005 | 2.3 | 1.14 | 62 | -10 |
| RH07S019 | 28-Jun-07 | 8:49:05PM | UTM | NAD27 | 7 | W | 513181 | 7096622 | 768 | m | soil | <25 | good | Light tan soil, talus of grey weathering white sandstone. | RH07S019 | 0.01 | 0.3 | 0.77 | 18 | -10 |

| Name | Ba_ppm | Be_ppm | Bi_ppm | Ca_% | Cd_ppm | Co_ppm | Cr_ppm | Cu_ppm | Fe_% | Ga_ppm | Hg_ppm | K_% | La_ppm | Mg_% | Mn_ppm | Mo_ppm | Na_% | Ni_ppm | P_% | Pb_ppm | S_% | Sb_ppm | Sc_ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RH07S001 | 200 | -0.5 | -2 | 0.05 | -0.5 | 3 | 54 | 140 | 5.48 | 10 | 0.05 | 0.35 | 10 | 0.39 | 168 | 53 | 0.02 | 9 | 340 | 23 | 0.5 | 21 | 6 |
| RH07S002 | 210 | -0.5 | -2 | 0.07 | -0.5 | 5 | 58 | 102 | 5.39 | 10 | 0.05 | 0.39 | 10 | 0.49 | 218 | 48 | 0.02 | 12 | 330 | 19 | 0.46 | 13 | 6 |
| RH07S003 | 140 | -0.5 | -2 | 0.06 | -0.5 | 5 | 27 | 159 | 6.78 | 10 | 0.02 | 0.54 | 20 | 0.27 | 169 | 76 | 0.05 | 12 | 1000 | 51 | 1.13 | 18 | 3 |
| RH07S004 | 360 | 0.9 | -2 | 0.06 | -0.5 | 13 | 24 | 173 | 7.98 | -10 | 0.03 | 0.39 | 30 | 0.31 | 279 | 22 | 0.05 | 16 | 1330 | 263 | 0.8 | 17 | 3 |
| RH07S005 | 220 | 2.6 | 12 | 0.33 | 1.2 | 25 | 19 | 120 | 12.8 | 10 | 0.01 | 0.42 | 40 | 1.54 | 1245 | 10 | 0.03 | 3 | 3070 | 293 | 0.3 | -2 | 12 |
| RH07S006 | 120 | 1.2 | -2 | 0.27 | -0.5 | 18 | 23 | 56 | 6.2 | 10 | 0.02 | 0.06 | 10 | 0.37 | 1960 | 3 | 0.01 | 13 | 1590 | 80 | 0.02 | -2 | 17 |
| RH07S007 | 270 | -0.5 | 2 | 0.08 | -0.5 | 6 | 32 | 22 | 4.09 | -10 | 0.03 | 0.3 | 10 | 0.3 | 203 | 5 | 0.01 | 14 | 230 | 17 | 0.54 | 16 | 4 |
| RH07S008 | 570 | -0.5 | -2 | 0.1 | -0.5 | 5 | 25 | 90 | 3.88 | -10 | 0.03 | 0.24 | 10 | 0.38 | 157 | 22 | 0.02 | 13 | 480 | 117 | 0.42 | 31 | 3 |
| RH07S009 | 90 | 0.7 | 3 | 0.16 | -0.5 | 5 | 17 | 212 | 8.43 | -10 | 0.03 | 0.98 | 20 | 0.28 | 209 | 12 | 0.06 | 6 | 1440 | 523 | 2.03 | 40 | 4 |
| RH07S010 | 80 | -0.5 | 2 | 0.16 | -0.5 | 6 | 67 | 269 | 8.8 | -10 | 0.03 | 0.88 | 30 | 0.08 | 147 | 526 | 0.02 | 13 | 670 | 71 | 1.94 | 12 | 12 |
| RH07S011 | 100 | -0.5 | -2 | -0.01 | -0.5 | 1 | 85 | 315 | 8.87 | 10 | 0.01 | 1.19 | 10 | 0.48 | 98 | 12 | 0.02 | 5 | 680 | 4 | 2.03 | 2 | 18 |
| RH07S012 | 270 | 1.2 | -2 | 2.55 | -0.5 | 25 | 146 | 45 | 5.44 | 10 | 0.2 | 0.43 | 60 | 1.35 | 685 | 1 | 0.02 | 79 | 1790 | 12 | 0.03 | 2 | 15 |
| RH07S013 | 80 | -0.5 | 25 | 0.01 | -0.5 | -1 | 24 | 35 | 6.11 | 10 | 0.01 | 1.01 | 20 | 0.05 | 24 | 74 | 0.02 | 4 | 440 | 79 | 1.97 | 63 | 2 |
| RH07S014 | 270 | -0.5 | 2 | 0.1 | -0.5 | 5 | 43 | 150 | 5.16 | -10 | 0.07 | 0.39 | 20 | 0.42 | 149 | 65 | 0.02 | 14 | 570 | 23 | 0.58 | 15 | 6 |
| RH07S015 | 450 | 1.4 | 5 | 0.9 | -0.5 | 15 | 42 | 128 | 5.7 | -10 | 0.11 | 0.12 | 40 | 0.3 | 1600 | 5 | 0.02 | 24 | 1520 | 38 | 0.05 | 3 | 10 |
| RH07S016 | 310 | 0.9 | -2 | 0.59 | -0.5 | 14 | 29 | 42 | 4.8 | 10 | 0.11 | 0.06 | 20 | 0.56 | 944 | 1 | 0.02 | 16 | 840 | 25 | 0.01 | 2 | 15 |
| RH07S017 | 300 | 0.5 | -2 | 0.48 | -0.5 | 9 | 35 | 32 | 3.09 | 10 | 0.04 | 0.06 | 20 | 0.58 | 277 | 1 | 0.02 | 27 | 620 | 10 | 0.01 | -2 | 6 |
| RH07S018 | 170 | -0.5 | 5 | 0.14 | 1.6 | 5 | 14 | 61 | 2.89 | -10 | 0.04 | 0.2 | 10 | 0.27 | 415 | 2 | 0.01 | 7 | 600 | 73 | 0.38 | 2 | 3 |
| RH07S019 | 120 | -0.5 | 2 | 0.03 | -0.5 | 2 | 11 | 15 | 2.59 | -10 | 0.02 | 0.15 | 10 | 0.11 | 100 | 1 | 0.01 | 6 | 400 | 11 | 0.29 | -2 | 1 |

| Name | Sr_ppm | Ti_% | V_ppm | Zn_ppm | Method | Certificate |
|---|---|---|---|---|---|---|
| RH07S001 | 17 | 0.08 | 81 | 55 | ME-ICP41 | VA07073489 |
| RH07S002 | 17 | 0.1 | 81 | 57 | ME-ICP41 | VA07073489 |
| RH07S003 | 31 | 0.05 | 63 | 97 | ME-ICP41 | VA07073489 |
| RH07S004 | 80 | 0.04 | 41 | 313 | ME-ICP41 | VA07073489 |
| RH07S005 | 184 | 0.05 | 174 | 1205 | ME-ICP41 | VA07073489 |
| RH07S006 | 14 | 0.01 | 127 | 635 | ME-ICP41 | VA07073489 |
| RH07S007 | 15 | 0.06 | 54 | 38 | ME-ICP41 | VA07073489 |
| RH07S008 | 26 | 0.05 | 51 | 75 | ME-ICP41 | VA07073489 |
| RH07S009 | 71 | 0.04 | 38 | 314 | ME-ICP41 | VA07073489 |
| RH07S010 | 38 | -0.01 | 50 | 91 | ME-ICP41 | VA07073489 |
| RH07S011 | 14 | 0.06 | 74 | 59 | ME-ICP41 | VA07073489 |
| RH07S012 | 79 | 0.04 | 66 | 94 | ME-ICP41 | VA07073489 |
| RH07S013 | 28 | 0.03 | 22 | 7 | ME-ICP41 | VA07073489 |
| RH07S014 | 33 | 0.07 | 57 | 52 | ME-ICP41 | VA07073489 |
| RH07S015 | 40 | 0.03 | 92 | 181 | ME-ICP41 | VA07073489 |
| RH07S016 | 54 | 0.07 | 111 | 323 | ME-ICP41 | VA07073489 |
| RH07S017 | 36 | 0.1 | 60 | 71 | ME-ICP41 | VA07073489 |
| RH07S018 | 50 | 0.03 | 35 | 303 | ME-ICP41 | VA07073489 |
| RH07S019 | 17 | 0.04 | 38 | 42 | ME-ICP41 | VA07073489 |

# Appendix C

# Magnetic Survey Specifications

v7.0

# Proton Precession

## Magnetometer / Gradiometer / VLF (GSM-19T v7.0)

**The new v7.0 system is the industry's latest innovation in proton precession design - with many new technologies that deliver significant benefits for earth science applications.**

**Key technologies include:**

- **Data export in standard XYZ (i.e. line-oriented) format for easy use in standard commercial software programs**
- **Programmable export format for full control over output**
- **GPS elevation values provide input for geophysical modeling**
- **Enhanced GPS positioning resolution**
  **<1.5m standard GPS for high resolution surveying**
  **<1.0m OmniStar GPS**
  **<0.7m for newly introduced CDGPS**
- **Multi-sensor capability for advanced surveys to resolve target geometry**
- **Picket and line marking / annotation for capturing related surveying information on-the-go**

**And all of these technologies come complete with the most attractive savings and warranty in the business!**


GSM-19T Proton Precession console with sensor and cable. Can also be configured with additional sensor for gradiometer(simultaneous) readings, built-in GPS and VLF EM system

For earth science survey groups who require a complete solution for end-to-end magnetic data acquisition at an affordable price, the GSM-19T proton precession family is the proven choice - for even the most challenging environments.

From robust field units to efficient survey modes to fast data downloading, the GSM-19T is carefully designed to deliver the maximum value in a proton precession system.

The GSM-19T also provides numerous technologies that differentiate it from other systems. For example, it is the only proton precession system with ***integrated GPS*** (optional) for high-sensitivity, accurately-positioned ground surveys.

With other v7.0 upgrades, GEM's proton precession system also leads in sensitivity, memory, base station technology, and other key areas.

### Designed From the Ground Up

Leading the list of advances is GEM's rover unit which features a 25% increase in ***sensitivity*** -- reflecting new processing algorithms and implementation of the latest RISC microprocessors.

In addition, v7.0 ***standard memory*** is 32 Mbytes (expandable in 32 Mb increments) which translates into 1,465,623 readings of line / station data or more than 5,373,951 readings for base station units.

The new memory capacity sets an industry standard, but more importantly, it means that operators can now handle even the largest surveys with ease.

Another important innovation is GEM's unique ***programmable base station*** which you can enable via either a field unit *or* a *Personal Computer* as follows:

Daily scheduling (define working hours and minutes each day). This mode provides economy of memory and battery usage on a daily basis.

Flexible scheduling (up to 30 on / off periods). Simply define a series of intervals and the base station will turn itself on as you need. This mode provides the greatest flexibility for longer surveys where leaving your base station running increases efficiency.

Immediate start. This mode is the traditional mode of starting a base station unit and leaving it until the operator can return to turn off the unit.

### Survey Planning and Efficiency

One of the traditional challenges in ground magnetometer / gradiometer surveys is ensuring that surveys are designed and implemented as effectively as possible.

With the v7.0 proton precession system, GEM addresses this challenge through

standard GEM capabilities, such as the Walking Mag option that enables the operator to sample while walking. Though there is some increase in noise, many users find this is balanced by improved field productivity. Having nearly continous data on survey lines also helps increase the accuracy of interpretations.

Another innovation is GPS way ***point pre-programming***. Now you can define a complete survey in the office on your Personal Computer and download this information directly to a rover unit via RS-232. Then, the operator simply performs the survey using the points as their survey guide -- with a resulting decrease in errors and more rapid survey completion.

### Survey Operations

The GSM-19T also helps the operator on a daily basis while performing surveys. A key feature is the ***easy-to-read LCD*** data display in graphical (or text) format along with a signal quality indicator to determine when readings need to be repeated.

And, although GEM's proton precession unit is very tolerant to gradients, it also provides a warning indicator so that the operator can monitor data quality continuously. Other features operators appreciate include easy-to-use line and station incrementing -- as well as end-of-line indicators.

### Fast Data Transfer

Another traditional area in which time is lost in surveys is in data transfer. In v7.0, GEM addressed this in several ways:

Data download is tripled to 115 KBaud (fastest rate possible with RS-232).

PC-based data reduction is now possible using an upgraded version of GEMLinkW, GEM's proprietary data transfer software.

### GPS and Other Software

GEM Systems recently became the only manufacturer to provide a ***fully integrated*** GPS option for its line of proton precession products. Along with metre to sub-metre positioning options, the new processing functionality enables users to take advantage of the benefits of GPS.

Some of the capabilities include:

Pre-programming of way points.

Post-processing of GPS data. GEM's DGPS option enables transfer of GPS data for post-processing and merging via 3rd party software.

Precise ***time synchronization*** of field and base station units. This capability is particularly important for working in noisy magnetic conditions and provides the highest accuracy possible.

In addition to its own software, GEM is also pleased to offer a variety of data analysis and processing software from 3rd party developers.

### Ongoing Maintenance and Support

As a potential user of a GSM-19T system -- the industry's end-to-end magnetometer / gradiometer solution -- you should also know that we stand by our technologies, products and services.

With a 27-year record of success and new innovations in magnetics -- plus ***Internet-based upgrades*** that keep your system up-to-date and our ongoing support -- we believe that you will find that GEM offers the best solution in proton precession units today.

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## Specifications

### *Performance*

| | |
|---|---|
| Sensitivity: | 0.05 nT @ 1 Hz |
| Resolution: | 0.01 nT |
| Absolute Accuracy: | +/- 0.2 nT @ 1 Hz |
| Dynamic Range: | 20,000 to 120,000 nT |
| Gradient Tolerance: | Over 7000 nT/m |
| Sampling Rate: | 60+, 5, 4, 3, 2, 1, 0.5 sec |
| Operating Temperature: | -40C to +50C |

### *Operating Modes*

Manual: Coordinates, time, date and reading stored automatically at minimum 3 second interval.

Base Station: Time, date and reading stored at 3 to 60 second intervals.

Remote Control: Optional remote control using RS-232 interface.

Input / Output: RS-232 or analog (optional) output using 6-pin weatherproof connector.

### *Storage - 32 MB (# of Readings)*

| | |
|---|---|
| Mobile: | 1,465,623 |
| Base Station: | 5,373,951 |
| Gradiometer: | 1,240,142 |
| Walking Mag: | 2,686,975 |

### *Dimensions*

| | |
|---|---|
| Console: | 223 x 69 x 240mm |
| Sensor: | 170 x 71mm diameter cylinder |

### *Weights*

| | |
|---|---|
| Console: | 2.1 kg |
| Sensor and Staff Assembly: | 2.2 kg |

### *Standard Components*

GSM-19T console, GEMLinkW software, batteries, harness, charger, sensor with cable, RS-232 cable, staff, instruction manual and shipping case.

### *Optional VLF*

Frequency Range: Up to 3 stations between 15 to 30.0 kHz.

Parameters: Vertical in-phase and out-of-phase components as % of total field. 2 relative components of the horizontal field.

# Appendix D

# Digital Data