## TECHNICAL ASSESSMENT REPORT SOIL GEOCHEMICSTRY VERIFICATION PROGRAM

#### KETCHUM LAKE COPPER GOLD PROJECT SHESLAY RIVER AREA

NORTHWESTERN BRITISH COLUMBIA

**Project Location:** 

The property is located approximately 65 kilometers north west of the community of Telegraph Creek and approximately 140 kilometers north of Novagold's Galore Creek Project. The approximate geographic centre of the property is situated at Latitude 56 degrees 52' and Longitude 130 degrees 05'.

Prepared for Ketchum Lake Project Syndicate

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SOW NO. 5474927

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#### SUMMARY

At the request of the current owners of the Ketchum lake Property the author has prepared a Technical Report ("the Report") which summarizes the results of a verification sampling program carried out during 2013 (as per SOW 5474927) to the standards dictated by National Instrument 43-101 and Form 43-101F (Standards of disclosure for Mineral projects).

The Ketchum Lake Property is an early stage alkalic porphyry copper-gold prospect located in north western British Columbia approximately 65 kilometres northwest of Telegraph Creek and approximately 140 kilometres north of Novagold Resources Galore Creek Project. This area of north western British Columbia hosts numerous advanced stage alkalic porphyry copper-gold projects and is referred to as the Stikine Arch.

The Ketchum Lake Property currently consists of 3 separate mineral titles totalling 1,509.49 hectares that form an irregular shaped, block roughly five kilometers long and three kilometers wide.

The Ketchum Lake area was originally identified by the Texas Gulf Sulfur Company ("Texas Gulf) as part of a regional "porphyry copper" reconnaissance program carried out in 1971. Widely spaced geochemical surveys (150 to 300 meter spaced survey lines) completed by Texas Gulf identified a three kilometre long, north trending zone of intermittent "copper in soil" anomalies and a limited program of hand trenching at the north end of the zone identified outcropping copper mineralization in an area referred to as "Mineral Hill".

Between 2006 and 2011 the subject Property was owned by Panorama Resources who completed extensive exploration between 2006 and 2008. In 2006 Panorama completed an airborne magnetic survey to define potential target areas for a follow-up program. During 2008 Panorama completed a detailed soil sampling program to delineate the extent of potential mineralized zones by infilling and extending the limits of the soil geochemical survey completed by Texas Gulf. As part of the 2006 program the UTM locations and "copper in soil" values from the Texas Gulf geochemical survey (consisting of 1,512 samples) were entered into a database. Sampling during the 2008 program consisted of 1,356 new samples collected at 25 meter intervals along 50 to 200 meter spaced lines designed to "infill" the Texas Gulf data and to extend the Texas Gulf grid to explore for possible extensions of the outcropping mineralization identified at the north end of the grid. The combined sample database for the Ketchum Lake Project now consists of 2,869 samples covering a grid area that extends for approximately 4.7 kilometers north to south and approximately 3.0 kilometers east to west. The current claim group covers all of the soil geochemical surveys completed by Texas Gulf and Panorama Resources.

The results of the 2008 program defined a high priority target area that extends for 1,100 meters to the north of the outcropping mineralization identified by Texas Gulf (Mineral Hill Prospect) and have identified multiple secondary targets within and to the south of the original Texas Gulf survey grid. In general, copper values within the anomalous areas are relatively subdued (150 to 400 ppm) however, spot highs within the high priority target area range from 450 to 1,586 and include one station that returned 9,237 ppm.

The secondary target areas comprise four, north trending to irregular shaped zones ranging from 150 to 700 meters in width that have been traced over strike lengths of up to 1.7 kilometers. It is interesting to note that even though there is no record of any drill testing in the BC government assessment report database the remains of a single drill station and several hundred meters of drill core were identified at the southern end of the primary target area. It is also interesting to note that potential extensions of this zone are covered by swamp and were not identified by Texas Gulf during the 1970's. Specialized soil augers that allowed penetration of organic layers up to 1.5 meters in thickness were successfully used during the 2008 program to extend the limits of this zone however extensive low lying areas remain to be tested and will require deeper penetration large areas of more effective .

The objectives of the 2013 program were to confirm the amplitude of the copper geochemical anomalies and to assess the variability of the copper in soil values at several locations immediately adjacent to several anomalous results obtained from the 2008 survey. A total of 14 soil samples were collected from various locations and results are described in this technical report. The total cost of the 2013 program was \$9,500.

#### 1. INTRODUCTION AND TERMS OF REFERENCE

#### 1.1 General Scope and Conduct

The author was requested by the current owners to review available historic technical information for the Ketchum Lake Property area, to supervise a verification program and assess the reliability of the geochemical survey completed by Panorama Resources in 2008.

The qualified person who is the author of this report worked on various exploration projects in the Galore Creek area between 2002 and present for several junior mining companies. The author visited the Ketchum Lake Property on October 16, 2006.

#### 1.2 Sources of Information

The available technical data for the Ketchum Lake Property consists of regional geological information compiled by the BC Ministry of Energy and Mines and assessment reports completed by the Texas Gulf Sulphur Company in 1972 and 1973 which are on file with the BC Ministry of Energy and Mines and results of exploration work completed by Panorama Resources between 2006 and 2008 outlined in Aris Report No.30522. Sources are listed in the References section of this report and are cited where appropriate in the body of this report.

The reports compiled by Texas Gulf and Panorama appear to have been completed by competent professionals without any misleading or promotional intent.

The main source of regional geological information concerning the project area is Bulletin 92 and Bulletin 104 published by the British Columbia Ministry of Energy and Mines. The author has no reason to doubt the accuracy or completeness of the contained information.

#### 1.3 Disclaimer

To the best of the author's knowledge at the time of writing of this report, the subject property(s) is free of any liens or pending legal actions and is not subject to any underlying royalties, back-in rights, payments or other encumbrances.

To the best of the author's knowledge, there are no known existing environmental liabilities to which the property is subject, other than the requirement to mitigate any environmental impact on the claims that may arise in the course of normal exploration work and the requirement to remove any camps constructed on the Ketchum Lake Claims or any equipment used in exploration of the claims in the event that exploration work is terminated.

#### 2. PROPERTY DESCRIPTION AND LOCATION

#### 2.1 Location

The property is located approximately 65 kilometers north west of the community of Telegraph Creek and approximately 140 kilometers north of Novagold's Galore Creek Project. The approximate geographic centre of the property is situated at Latitude 56 degrees 52' and Longitude 130 degrees 05'.

The location of the project area relative to other mining claims, access roads and other developed alkalic porphyry copper-gold prospects is illustrated in Figure 1.

#### 2.2 Property Description

The property consists of 3 contiguous map staked mineral titles comprising 1,509.49 hectares. The claims form an irregular, staircase shaped, north to north east oriented block roughly 9 kilometers long and 5 kilometers wide

Previous owner Panorama Resources Ltd. acquired a 100% interest in the Property by direct purchase and staking in 2006. Panorama allowed the claims to lapse on October 30, 2011. The current owners acquired the Property by staking on November 01, 2012.

tenure no.	issue date	good to date	area in ha	registered owner
1014179	20121101	20161101	101.75	Will Friesen
1014174	20121101	20161101	576.57	Will Friesen
1025908	20140212	20150212	831.17	Will Friesen
Total area			1,509.49	

Plate 1: Listing of claims comprising the Ketchum Lake Property effective January 15, 2007.

Figure 3 shows the location of each of the mineral claims that comprise the Ketchum Lake Property relative to generalized topographic features and also shows the location of the former Texas Gulf and Panorama claim groups.

#### 2.3 Provincial Mining Regulations

All of the claims which comprise the Ketchum Lake Property were staked pursuant to the BC Ministry of Energy and Mines MTO system (Mineral Titles Online System). Title to the claims is maintained through the performance of annual assessment filings and payment of required fees.

Effective July 1, 2012 new regulations came into effect that changed the requirements from a 2tier system to a 4-tier system and have significantly increased the minimum exploration expenditures that are required to maintain mineral tenures in good standing. Under the new regulations all mineral tenures are deemed to be in their first anniversary year and the new minimum exploration expenditures will be \$5.00 per hectare for anniversary years 1 and 2, \$10.00 per hectare for anniversary years 3 and 4; \$15.00 per hectare for anniversary years 5 and 6 and \$20.00 per hectare for each subsequent anniversary year.

To the best of the author's knowledge, government permits will be required to carry out the proposed Stage I, II and III exploration programs. This program will require application to the Ministry of Energy and Mines for permits and the Issuer may be required to post security equivalent to the estimated costs of any reclamation work which will be required after completion of the proposed exploration work.

The reader is cautioned that there is no guarantee that the Issuer will be able to obtain the permits required to carry out the proposed work program. However, the author is not aware of any problems encountered by other junior mining companies in obtaining the permits required to carry out similar programs in nearby areas.

To the best of the author's knowledge approval from local First Nations communities will also be required to carry out the proposed exploration programs. The reader is cautioned that there is no guarantee that the Issuer will be able to obtain approval from local First Nations. However, the author is not aware of any problems encountered by other junior mining companies in obtaining approval to carry out similar programs in nearby areas nor is the author aware of any instances where local First Nations communities have objected to exploration work in the general project area.

To the best of the author's knowledge, none of the claims which comprise the Ketchum Lake Property have surface rights. In the event that a significant mineralized zone is identified detailed environmental impact studies will need to be completed prior to initiation of any advanced exploration or mining activities. The reader is cautioned that there is no guarantee that areas for potential mine waste disposal, heap leach pads, or areas for processing plants will be available within the Ketchum Lake Claim Group.

#### 3. ACCESSIBILITY, CLIMATE, PHYSIOGRAPHY AND INFRASTRUCTURE

#### 3.1 Accessibility and Infrastructure

Access to the property is by way of helicopter or fixed wing aircraft from the community of Telegraph Creek approximately 65 kilometers south east of the property or from the community of Dease Lake approximately 100 kilometers east of the Property. Figure 1 shows the location of the property relative to nearby access roads, mines and other developed prospects. It is also possible to land a float plane on Ketchum Lake located at the south eastern corner of the Ketchum Lake Property.

There is no road access to the claims however there is an airstrip located at the Sheslay River ten kilometres to the south of the property and the road to the former Golden Bear Mine passes roughly twenty kilometres to the south of the property. If warranted it would be feasible to construct an access road to the property however the best way to access the claims at present is by helicopter from the community of Dease Lake located about 100 kilometers to the east.

Crews travelling to and from the site can stay at Dease Lake 100 or at Telegraph Creek Driving time to Dease Lake from Terrace is approximately eight hours. Experienced field personnel and drilling contractors are available in the communities of Terrace and Smithers. A temporary tent camp for crew accommodation for completion of the proposed Stage 1 program will need to be constructed on site.

#### 3.2 Physiography, Climate, Vegetation and Current Land Use

The physiography of the Property is moderate, outcrop is limited and elevations range from 1,090 meters a.s.l. to 1,130 meters a.s.l. The Property straddles the headwaters of the Didudontu River. Within the Ketchum Lake area topography is generally subdued. Figure 3 shows the property boundaries and tenure reference numbers relative to generalized topography.

The project area is in the rain shadow of the Coast Range Mountains and annual precipitation is 425 mm including average snowfall of 218 cm. The Ketchum Lake Property is generally free of snow for approximately six months of the year. In general, exploration work in this area is carried out from June until October however snow cover is generally light and exploration work could be carried out from April through to November.

Satellite imagery shows that approximately 90% of the area within the Ketchum Lake Property is either forest covered or overburden covered. Forested areas comprise stunted spruce, fir and cedar typical of sub-alpine conditions. Due to limited access current land use is limited to hunting.

#### 4. HISTORY OF EXPLORATION

#### 4.1 General Description

In 1897 the Telegraph Trail which ran from Telegraph Creek to Atlin, was established and used as a major transportation route to the goldfields of the Yukon. In 1901 the Dominion of Canada Government connected the Yukon telegraph line with the British Columbia system that had previously ended in Quesnel. (Travis, A., 2004). The Telegraph Trail passes through the central part of the Ketchum Lake Property along the Dudidontu River Valley. In 1936 the Yukon Telegraph line was shut down, short wave radio had come into use and therefore telegraph communication no longer seemed necessary

The earliest recorded discovery of copper mineralization in the general project area was the discovery at Copper Creek located approximately 15 kilometers south of the Ketchum Property. The first exploration work was carried out in the late 1950's and by the early 1960's both Kennecott and Newmont were involved in exploration near the Copper Creek project.

The only recorded systematic exploration work within the Ketchum Lake Property was carried out by Texas Gulf in the early 1970's and by Panorama Resources in between 2006 and 2010. . It is interesting to note that even though there is no record of any drill testing in the BC government assessment report database the remains of a single drill station and several hundred meters of drill core were identified at the southern end of the primary target area. It is also interesting to note that potential extensions of this zone are covered by swamp and were not identified by Texas Gulf during the 1970's. Specialized soil augers that allowed penetration of organic layers up to 1.5 meters in thickness were successfully used during the 2008 program to extend the limits of this zone.

#### 4.2 Texas Gulf Sulfur Company

Texas Gulf discovered porphyry copper-gold mineralization as part of a regional reconnaissance program in 1971 and carried out soil geochemical and orientation geophysical surveys.

The geochemical surveys comprised a total of 1,193 samples collected at approximately 30 meter intervals on lines spaced approximately 150 meters apart. Samples were analyzed for copper, zinc and molybdenum. The geochemical surveys completed by Texas Gulf defined a copper in soil anomaly up to four hundred meters in width that extends intermittently for approximately three kilometres along strike. The mineralized zone referred to as the Mineral Hill Prospect is located at the northern end of the anomaly. The copper in soil anomaly appears to be open to the north of the Mineral Hill prospect and also appears to be open in a south south east direction from the southern limit of geochemical survey grid completed by Texas Gulf. Figure 5 shows the location of the Texas Gulf grid and the approximate location of the

"copper in soil" anomalies identified by Texas Gulf. Threshold values were arbitrarily set at 110 ppm copper and peak values ranged from 350 to 1,330 ppm copper.

Results of this work identified a significant zone of north to northwest trending copper-gold mineralization referred to as the Mineral Hill Prospect, measuring approximately 93 meters in width and 243 meters in length. According to Texas Gulf all composite trench samples collected within this zone returned copper values higher than 0.2% copper and elevated gold and silver values with some trenches returning values up to 1.6 meters that averaged 3.1% copper.

The final technical reports completed by Texas Gulf in 1973 note that the much of the prospective contact zone between the intrusive rocks and the andesites is covered by either by clay rich overburden which can mask geochemical dispersion or Tertiary volcanic rocks. In addition it was noted that some trenches failed to penetrate the leached zone and may not have adequately tested the mineralized zone. The technical reports further note that results of an orientation induced polarization survey carried out over the known mineralized zone indicate that this type of survey may be an effective method for delineating potential extensions of the zone.

The technical reports published by Texas Gulf in 1973 indicate that mineralization is hosted by Late Triassic to early Jurassic aged syenites and monzonites which intrude Triassic aged andesites belonging to the Stuhini Group. This is the same geological setting that hosts most of the porphyry prospects in the Stikine Arch

There is no record of any follow up exploration work on the ground covered by the Panorama claims and considering increasing industry interest in the porphyry copper-gold prospects in north western British Columbia the author recommended that Panorama complete an initial stage of exploration on the Ketchum Lake Property.

#### 4.3 Panorama Resources (2006 – 2010)

Between October 15 and December 15, 2006 Panorama contracted Fugro Airborne Surveys of Mississauga Ontario to complete a helicopter borne magnetic survey that covered the entire Ketchum Lake Property. In addition Panorama carried out a program of geological work including digitizing the Texas Gulf data, preparing digital elevation models and detailed topographic maps.

The author made a site visit by helicopter from Dease Lake on October 16th to verify the mineralization reported by Texas Gulf. Results of sampling by the author confirmed that the mineralized area identified by Texas Gulf does in fact host significant copper gold mineralization. A series of 14 mineralized grab and chip samples were collected from two trenches located in the west central part of the Mineral Hill Zone and results ranged from 0.86 to 5.03% copper,

0.06 to 0.54 g/t gold and 5.7 to 20.7 g/t silver. Select mineralized samples assayed up to 8.68% copper.

Field examinations showed that mineralization occurs in multiple parallel, braided, breccia zones a few centimeters to several meters in width. The strongest mineralization consists of coarsegrained hematite containing random sulphide grains or, less commonly, patches of sulphide grains with little or no hematite.

The most widespread mineralization is scattered grains or stringers of chalcopyrite, pyrite and specular hematite or coatings of malachite on fracture and shear planes. Detailed examination reveals that in addition to the main sulphides chalcopyrite and pyrite, small amounts of bornite, chalcocite, minor sphalerite, tennantite and traces of an unidentified sulphosalt are present.

Data from the airborne magnetic survey indicates that the mineralization associated with the Mineral Hill prospect and the main copper geochemical anomalies identified by Texas Gulf are associated with a broad, north to northeast trending magnetic low. The total field magnetics data are included as figure 6.

The magnetic anomaly extends for up to two kilometres to the north and south of the limits of the geochemical anomaly defined by Texas Gulf and parallels the interpreted contact between the intrusive rocks in the north eastern and eastern parts of the property and the andesites belonging to the Stuhini group in the central part of the property. The outline of the inferred prospective contact zone is shown in figure 6.

The objective of the 2008 program was to delineate the extent of potential mineralized zones by infilling and extending the limits of the soil geochemical survey completed by Texas Gulf. As part of the 2006 program the UTM locations and "copper in soil" values from the Texas Gulf geochemical survey (consisting of 1512 samples) were entered into a database. Sampling during the 2008 program consisted of 1,356 new samples collected at 25 meter intervals along 50 to 200 meter spaced lines designed to "infill" the Texas Gulf data and to extend the Texas Gulf grid to explore for possible extensions of the outcropping mineralization identified at the north end of the grid. The combined sample database for the Ketchum Lake Project now consists of 2,869 samples covering a grid area that extends for approximately 4.7 kilometers north to south and approximately 3.0 kilometers east to west..

The results of the 2008 program have defined a high priority target area that extends for 1,100 meters to the north of the outcropping mineralization identified by Texas Gulf (Mineral Hill Prospect) and have identified multiple secondary targets within and to the south of the original survey grid. In general, copper values within the anomalous areas are relatively subdued (150 to 400 ppm) however, spot highs within the high priority target area range from 450 to 1,586 and include one station that returned 9,237 ppm.

The secondary target areas comprise four, north trending to irregular shaped zones ranging from 150 to 700 meters in width that have been traced over strike lengths of up to 1.7 kilometers. It is interesting to note that even though there is no record of any drill testing in the BC government assessment report database the remains of a single drill station and several hundred meters of drill core were identified at the southern end of the primary target area. It is also interesting to note that the extensions of this zone are covered by swamp and were not identified by Texas Gulf during the 1970's. Specialized soil augers that allowed penetration of organic layers up to 1.5 meters in thickness were successfully used during the 2008 program to extend the limits of this zone.

The Primary Target Area No.1 (referred to as "PT1" or the "Mineral Hill Zone") extends from UTM 6476500 North to 6478200 North and ranges from 125 to 200 meters in width. Secondary Target Area 1 (ST1) is a north trending anomaly approximately 600 meters long and 200 meters in width located approximately 200 meters west of the southern end of the Primary Target Area. Secondary Target Area 2 (ST2) is similar in size to ST1 and is situated in a low lying area in the western part of the grid approximately 500 meters to the south of ST1.

Secondary target Area 3 (ST3) is the largest of the anomalous areas and is located in the central part of the survey grid. ST3 consists of an irregular shaped area roughly 900 meters in diameter which is connected to a narrower, north northeast trending area of elevated copper values that terminates approximately 500 meters southeast of PT1 Secondary target Area 4 "ST4" consists of a narrow, north trending anomaly that is approximately one kilometre in length located in the south eastern part of the grid area.

All of the target areas that have been identified are localized within overburden or swamp covered areas that have little or no outcrop and as a result geophysical surveys will be required to define drill targets within the "copper in soil" anomalies. Compilation maps showing the anomalous area that have been identified are included in this report.

#### 5. GEOLOGICAL SETTING

#### 5.1 Regional Geology

Author's note: The majority of the information in this item is excerpted from Bulletin 92 and Bulletin 104 published by the British Columbia Ministry of Energy and Mines.

The Ketchum Lake Property area is located in the west central part of the Stikine Terrane which is the westernmost terrane of British Columbia's Intermontane Belt. Like the other terranes of the North American cordilleran, the Stikine Terrane originated as an island arc west of ancestral North America and was almagamated along with the Cache Creek, Quesnel and Slide Mountain terranes prior to accretion to the North American craton. To the west the

The Stikine terrane comprises Paleozoic aged sediments and volcanics referred to as the Stikine Assemblage which are unconfomably overlain by Triassic aged sediments and volcanics belonging to the Stuhini Group. These rocks are intruded by late Triassic to Early Jurassic aged alkaline bodies which occupy a north northwest trending belt along the east side of the Coast Plutonic Belt.

Regional geological maps published by the BC Ministry of Mines show that the Property is underlain mainly by rocks of the Stikine Terrane (Stikinia). This region is underlain predominantly by Late Paleozoic and Mesozoic volcanic and is characterized by metal deposits related to island-arc volcanic centers. Mineral deposits commonly found in island arc settings include porphyry, intrusion-related (*i.e.*mesothermal) vein, metasomatic skarn, epithermal vein and volcanogenic massive sulphide deposits of the Kuroko type. No past production is recorded for the map area although large copper, gold and silver reserves have recently been defined at Galore Creek (proven and probable reserves effective October 5, 2006 as per Novagold News Release: 540.7 million tons containing 6.6 billion pounds of copper, 5.3 million ounces of gold and 92.6 million ounces of silver. According to Bulletin 92 published by BCEMPR alkalic porphyry copper-gold mineralization consists of breccia zones, stockworks, veinlets and disseminations of pyrite, chalcopyrite, bornite and magnetite within large zones of economically bulk-mineable mineralization in or adjoining porphyritic intrusions of diorite to syenite composition. The mineralization is spatially, temporally and genetically associated with hydrothermal alteration of the intrusive bodies and host rocks.

According to Barr et al., 1976, alkalic porphyry copper deposits occur throughout the Intermontane Belt in both the Stikine and Quesnel terranes and are restricted to the volcanic island arc assemblages of the Nicola, Takla and Stuhini groups. The best known example of the alkaline porphyry copper deposits in the Stikine Terrane is the Galore Creek deposit located approximately 140 kilometers south of Ketchum Lake. Galore Creek is presently the focus of an intensive evaluation by Nova Gold Resources Ltd. Age dating shows that U-Pb ages are similar (circa 200 to 210 Ma) for intrusions associated with porphyry Cu-Au deposits in both the Stikine

and the Quesnel terranes. Multiple alkaline intrusions and associated ultramafic phases are also present at Galore Creek (Barr, 1966; Allen *et al.*, 1976; Enns *et al.*, 1995) U-Pb dates of 205.1  $\pm$ 2.3 (zircon) and 200.1 $\pm$ 2.2 (titanite) for the potassium feldspar megacrystic syenite porphyry at Galore Creek (Mortensen *et al.*, 1995) constrain emplacement ages and brackets Cu-Au mineralization.

The Ketchum Lake area lies within an important base and precious metal-rich part of Northwestern British Columbia, termed the "Stikine Arch or Golden Horshoe" (Lefebure, 1991). The Horseshoe extends north from Alice Arm to the Taku River, east of the Coast Belt, and wraps back around the northwestern edge of the Bowser basin as far east as the Toodoggone River.

For the subject property alkalic porphyry copper-gold deposits are believed to be the most important potential target.

#### 5.2 Property Geology

According to technical reports prepared by the Texas Gulf Sulfur Company in 1972 and 1973 the Ketchum Lake area is underlain by andesitic volcanic rocks which have been intruded by syenitic rocks that appear to be genetically related to the andesites. Refer to figure 4.

The syenite, in which mineralization occurs, is part of a complex intrusive body, varying in composition from granodiorite to syenite, and outcropping over an area of some six by twelve kilometers, to the north of Ketchum Lake. The andesitic volcanic rocks are believed to be Upper Triassic in age. The contacts between the andesites and the intrusive rocks are largely obscured by Tertiary aged volcanic rocks to the northwest and to the east of the Ketchum Lake area.

The andesites are the oldest rocks exposed in the area. They are extensively altered and incorporated into the underlying intrusive bodies. The roof pendants or downward faulted blocks of andesite form a northeast-trending belt across the claim area. The granodiorite, hybrid syenite and syenite may be differential phases of a complex intrusion

The granodiorite and hybrid syenite masses have local variations in composition especially noticeable where andesites have been incorporated. The Tertiary volcanic flows, up to 250 meters thick, are predominantly basalts intercalated with minor rhyolite. They unconformably overlie the older rocks and may fill a pre-existing valley on the west side of the claim group. Tertiary feeder dykes, of variable composition, are aphanitic in character. They are seen to cut all the older rocks in the area.

Two major fault systems are present in the area, a north-northwest system and a northeast system. Both systems are steeply dipping normal faults. The northeast system is the older and

is offset by the north northwest system. It appears to control the rock type distribution. The north-northwest fault system may control the mineralization. Crackling in the pink syenite is evident on Mineral Hill and other mineralized areas. This crackling shows up as light foliation or as uneven fracture surfaces approximately one-half inch apart. On Mineral Hill the crackling may contain chalcopyrite.

According to the Texas Gulf reports field mapping suggests there may be concentric zones of alteration around the mineralization on Mineral Hill. This zonation consists of a central core of fresh pink syenite followed by a zone of sericitization and/or kaolinization of mafics and feldspars in the syenite and hybrid syenite. This zone is followed by progressively weaker argillic alteration, until fresh hybrid syenite is the dominant rock. Sericitization and kaolinization of the syenite is also present along the Dudidontu River but not as well developed as in the Mineral Hill area. Local chloritization of the mafics in granodiorite is present adjacent to faults. Chloritization and epidotization of the andesites are pronounced. In some areas epidote is the main constituent, in others, alteration is not as intense and only chloritization has taken place.

#### 6. **DEPOSIT MODELS**

## 6.1 Characteristics of alkalic porphyry copper-gold deposits (Reference BCEMPR Bulletin 092)

Alkalic porphyry copper-gold deposits occur throughout the length of the Intermontane Belt in both Stikinia and, Quesnellia (Northern and central BC). They are restricted to Late Triassic and Early Jurassic volcanic island arc assemblages of the Nicola, Takla and Stuhini groups and form a class distinct from the calcalkaline porphyry deposits (Barr *et* al., 1976).

Mineralization occurs in alkaline magmatic centers that are characterized by alkaline intrusions and comagmatic subalkaline to alkaline and shoshonitic volcanic rocks (de Rosen- Spence, 1985,). Crowded feldspar porphyritic textures are characteristic of both the intrusives and the volcanics; pyroxene-phyric basalts are typical.

The alkaline intrusions evolved from crystal-fractionated, volatile and metal-enriched magmas (Fox, 1989; Mutschler *et al.*, 1990) that were emplaced rapidly and often intrude their volcanic edifice Multiple intrusions of crystal-rich magma produce porphyritic textured intrusives, intrusive breccias and hydrothermal breccias. These intrusive pulses predate, coincide with and postdate alteration and mineralization related to the magmatic centers.

The intrusive bodies are typically small (less than 2 to 3 kilometers across), spatially related to long-lived regional-scale faults (Preto 1989, Nelson, 1991) and commonly have spatial and temporal relationships with calcalkaline magmatism.

The deposits occupy brecciated and faulted zones related to extensively altered subvolcanic

intrusions and their volcanic country rocks. Alteration patterns are distinctly different from those of classic calcalkaline deposits, characterized by concentric phyllic-argillic-propylitic zones. The alkalic deposits typically have a central potassic-or sodic plagioclase zone which passes outward into a propylitic zone. These often overlap and are overprinted by retrograde metasomatic alteration (refer to Figure.3).

Magnetite breccias and disseminations are associated with the potassic alteration zone, which hosts most of the copper and gold mineralization. Disseminated pyrite and minor copper mineralization mantle the propylitic alteration zone.

Typical sulphide assemblages include pyrite, chalcopyrite, bomite, chalcocite and pyrrhotite in decreasing abundance. The deposits are characteristically enriched in silver and gold, and are particularly silver-rich in comparison with calcalkaline porphyry deposits (Sinclair *et* al., 1982).

#### 7. MINERALIZATION

#### 7.1 Mineral Hill Zone

The most important mineralized zone identified to date on the Ketchum Lake Property is the Mineral Hill Prospect. The mineralized zone was identified by reconnaissance prospecting carried out by Texas Gulf in 1971. Limited trenching of the northernmost geochemical anomaly identified a significant zone of copper mineralization referred to as "Mineral Hilll" or the Pet Prospect. Trenches were cut on east-west lines of the flagged grid, except in the immediate area of mineralization, where they are closer together.

A mineralized area, in which all save two composite samples returned assays of a t least 0.20 percent copper, was extended to a length of 243 meters and a width of 93 meters (length of 800 feet and a width of 300 feet). The zone was defined by a series of twelve, 3.0 to 15.0 meter long, hand excavated trenches According to Texas Gulf all composite trench samples collected within this zone returned copper values ranging from 0.18 to 1.83% copper along with elevated gold and silver values and individual assays within this zone run as high as 3.18% copper, over 1.6 meters. The mineralization consists of malachite, azurite, chalcopyrite, chalcocite and bornite in association with hematite and pyrite, which occurs in braided, steeply-dipping fracture zones. Small amounts of gold and silver were detected in the assayed samples.

According to Texas Gulf the area of 0.20 percent copper, occurs primarily within the pink syenite phase of the intrusive. A peripheral area of lower grade copper mineralization was also established around the higher grade zone.

According to the technical summary included in the BC Ministry of Mines Minfile database mineralization at Mineral Hill occurs in multiple parallel, braided, breccia zones up to several meters in width. The strongest mineralization consists of coarse-grained hematite containing random sulphide grains or, less commonly, patches of sulphide grains with little or no hematite. The most widespread mineralization is scattered grains or stringers of chalcopyrite, pyrite and specular hematite or coatings of malachite on fracture and shear planes. Detailed examination reveals that in addition to the main sulphides chalcopyrite and pyrite and copper oxides, small amounts of bornite, chalcocite, minor sphalerite, tennantite and traces of an unidentified sulphosalt are present.

Technical reports prepared by Texas Gulf indicate that the most widespread alteration is a pervasive, pink coloration that may be caused in part by potassium feldspar. Sheared rocks usually appear bleached due to an increase in sericite and clay minerals and an attendant destruction of biotite. A distinctive gossan has formed over parts of the mineralized zone characterized by "limonite" that is a dark yellowish brown color.

Results of sampling by the author confirmed that the mineralized area identified by Texas Gulf does in fact host significant copper gold mineralization. A series or 12 mineralized grab and chip samples were collected from two trenches located in the west central part of the Mineral Hill Zone and results ranged from 0.86 to 5.03% copper, 0.06 to 0.54 g/t gold and 5.7 to 20.7 g/t silver. Select mineralized samples assayed up to 8.68% copper.

The Primary Target Area No.1 (referred to as "PT1" or the "Mineral Hill Zone") extends from UTM 6476500 North to 6478200 North and ranges from 125 to 200 meters in width. Secondary Target Area 1 (ST1) is a north trending anomaly approximately 600 meters long and 200 meters in width located approximately 200 meters west of the southern end of the Primary Target Area. Secondary Target Area 2 (ST2) is similar in size to ST1 and is situated in a low lying area in the western part of the grid approximately 500 meters to the south of ST1.

Secondary target Area 3 (ST3) is the largest of the anomalous areas and is located in the central part of the survey grid. ST3 consists of an irregular shaped area roughly 900 meters in diameter which is connected to a narrower, north northeast trending area of elevated copper values that terminates approximately 500 meters southeast of PT1 Secondary target Area 4 "ST4" consists of a narrow, north trending anomaly that is approximately one kilometre in length located in the south eastern part of the grid area.

All of the target areas that have been identified are localized within overburden or swamp covered areas that have little or no outcrop and as a result geophysical surveys will be required to define drill targets within the "copper in soil" anomalies. Compilation maps showing the anomalous area that have been identified are included in this report.

#### 8. EXPLORATION COMPLETED IN 2013

The current claim group covers all of the soil geochemical surveys completed by Kerr Addison and Panorama Resources.

The objectives of the 2013 program were to confirm the amplitude of the copper geochemical anomalies and to assess the variability of the copper in soil values at several locations immediately adjacent to several of the anomalous results obtained from the 2008 survey.

A total of 14 soil samples were collected from various locations within the area referred to as the Primary Target Area and results are included in this technical report. Three groups of samples were collected from three separate areas consisting of 3 to 6 samples each at intervals of approximately 100 meters. Figure 5 shows the general area where samples were collected during the 2013 program and Figure 6 and 7 are detailed plans which show the sample numbers and copper values for each sample in ppm.

The most northerly group of samples comprised 6 closely spaced samples collected at approximately 6477050North and 336950East. A second group of four samples were collected approximately 100 meters to the south of the first group and an additional four samples were collected adjacent to exposed mineralization which forms part of the Pet Prospect.

Results from the most northerly group of samples showed relatively high variability (141 ppm copper to 365 ppm copper) however, five out of the six samples returned results greater than 150 ppm copper which is considered anomalous in this environment.

The second group of samples consisted of four closely spaced soil samples collected approximately 100 meters to the south of the first group and were intended to assess the area between the Mineral Hill Prospect (located approximately 200 meters to the south of the most northerly sample group. Results confirmed the initial survey results which showed only weakly anomalous results (82 ppm to 167 ppm).

The third group of samples consisted of four samples collected at 5 meter intervals adjacent to exposed copper mineralization which forms part of the Mineral Hill Prospect. Results showed very strong copper values ranging from 1,880 to more than 10,000 ppm copper. The historic drill site referenced in this report is situated approximately 75 meters to the west of this area.

#### Ketchum Project Cost Statement SOW No. 5474927 For the period ended October 31, 2013

#### Cost Statement

	CDN
Geological Field Work and Subcontractors	2,309.59
Field Equipment Rentals and Helicopter Charter Expenses	4,707.00
Auxilliary Field Equipment Rentals	250.00
Geochemical Analyses and Petrographic work	430.64
Geological and GIS technical mapping / Technical Reporting	2,615.00
Total	10,312.23
Cost Statement - Detail	
Geological Field Work and Subcontractors	
Equipment preparation and field crew mobilization (pro-rated with other Iskut area projects) Carl von Einsiedel	959.59
Rock and Soil sampling program	
Carl von Einsiedel - 1 day @ \$900	900.00
Technician - 1 day @ \$450	450.00
Field Equipment Rentals and Helicopter Charter Expenses	
Ram Explorations Truck Rental	
<b>2005 F250 4x4 HD extended cab (modified for offroad operations)</b> 1 day @ \$125	\$ 125.00
	+
Ram Explorations Motorhome Rental (modified as emergency first aid station)	¢ 120.00
1 day @ \$130	\$ 130.00
LakeLSE - Helicopter Charter	
Invoice 4253 - August 28, 2013	
8 hours @ \$924.90 / hr (pro-rated 50% with other Iskut River Projects) Fuel (pro-rated 50% with other Iskut River Projects)	3,699.60
ruer (pro-rated 50% with other iskut kiver Projects)	752.40
GPS, VHF and SPOT GPS emergency locator, soil augers etc.	250.00
Geochemical Analyses and Petrographic work	
ALS Chemex	
VA13165936 - September 20, 2013	180.64
Soil and rock sample bags, consumables etc. from stock	250.00
Technical Reporting	
Carl von Einsiedel	
14 hours @ \$120	1,680.00
DGW Consultants	
11 hours @ \$85	935.00

#### 9. DRILLING

No drilling was carried out by on the Ketchum Lake Property by Panorama Resources Ltd.

#### 10. SAMPLING METHOD AND APPROACH

As noted in Section 8. Exploration the only sampling that was carried out was a verification sampling program designed to confirm that significant copper-gold mineralization is present at the Mineral Hill prospect.

#### 11. SAMPLE PREPARATION, ANALYSIS AND SECURITY

All samples collected by the author from the Ketchum Lake Property were sealed in Kraft sample bags and shipped by bonded commercial transport to ALS Chemex in North Vancouver.

All samples were prepared and analyzed by ALS Chemex. Samples were dried, sieved to -80 mesh and analyzed by ICP 41 for copper and a suite of 41 elements. All overlimit copper analyses were performed by gravimetric methods with a error range of 0.01%. Additional details are included in the analytical report included as Appendix 2.

Standard QA and QC procedures were implemented by ALS Chemex and all reported analyses are within acceptable industry standards.

#### 12. DATA VERIFICATION

As noted in Section 8. Exploration the only sampling that was carried out was a verification sampling program designed to confirm that significant copper-gold mineralization is present at the Mineral Hill prospect.

Details of this sampling program are included in Section 8. Sample preparation and sample analysis are listed in the preceding Section 11.

The geochemical survey completed by Texas Gulf has not been verified.

The results of the orientation induced polarization survey by Texas Gulf have also not been confirmed.

#### 13. ADJACENT PROPERTIES

There are no adjacent properties of interest.

#### 14. MINERAL PROCESSING AND METALLURGICAL TESTING

There is no mineral processing or metallurgical testing data from the project.

#### 15. MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

There is no mineral resource compliant with CIM Standards on Mineral Resources and Reserves (CIM, 2000) and therefore no NI 43-101 compliant resource for the property.

#### 16. OTHER RELEVENT DATA AND INFORMATION

There is no other relevant data or information concerning the property.

#### 17. INTERPRETATION AND CONCLUSIONS

The geological maps published by the BC Ministry of Energy and Mines confirm that the Ketchum Lake Property is crosscut by north northwest and north east trending fault zones and is underlain by Triassic aged volcanics and late Triassic to early Jurassic aged syenitic intrusives. This geological setting is an important host for porphyry copper-gold mineralization in the Stikine area of north western British Columbia.

Geochemical surveys and geophysical surveys completed by Texas Gulf in the early 1970's and by panorama Resources between 2006 and 2010 partially defined an area of elevated copper values in soils and reportedly identified a zone of copper mineralization.

The technical reports published by Texas Gulf and the verification sampling program carried out by the author confirm that there is a significant zone of copper-gold mineralization present on the Ketchum Lake Property. Potential extensions of the known mineralized areas are either masked by recent volcanics or by overburden cover. Additional detailed sampling will be required to delineate potential extensions of this zone. Additional sampling is also required to asses potential south and southeast extensions of the geochemical anomalies identified by Texas Gulf.

Results of the airborne geophysical survey and verification sampling completed by Panorama confirm that there is potential to expand the known mineralization and potential to identify additional mineralized zones.

#### 18. SOURCES OF INFORMATION

#### Publications

Panorama Resources, 2009: technical assessment Report of the Ketchum lake Property – Geochemical Survey, Aris Report No: 30522

Newell, J.M., Delancy, P.R., 1972, ARIS Assessment Report No. 3695: Geological and Geochemical Report on the Pet Mineral Claims., January, 1972. Texas Gulf Sulfur Company

Newell, J.M., Podolsky, G., and Deighton, J.R., 1972, ARIS Assessment Report No. 4095: Geological and Geophysical Report on the Pet Mineral Claims., January, 1973. Texas Gulf Inc.

Travis, A., Keewatin Consultants, ARIS Assessment Report No. 27,435: Geochemical and Geohysical Report on the Copper Creek Property, dated March 31, 2004

**Internet Sites** 

Note: all data from BC Ministry of Mines downloaded from: http://www.em.gov.bc.ca/Mining/Geolsurv/MapPlace/geoData.htm

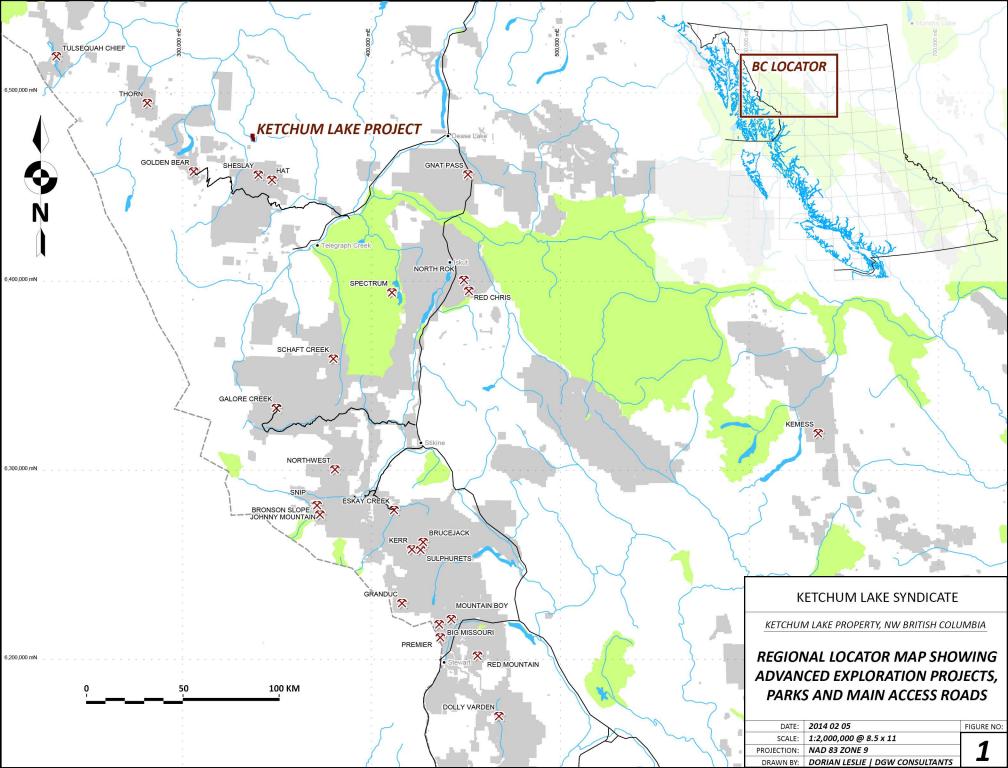
#### 19. CERTIFICATE OF QUALIFICATION

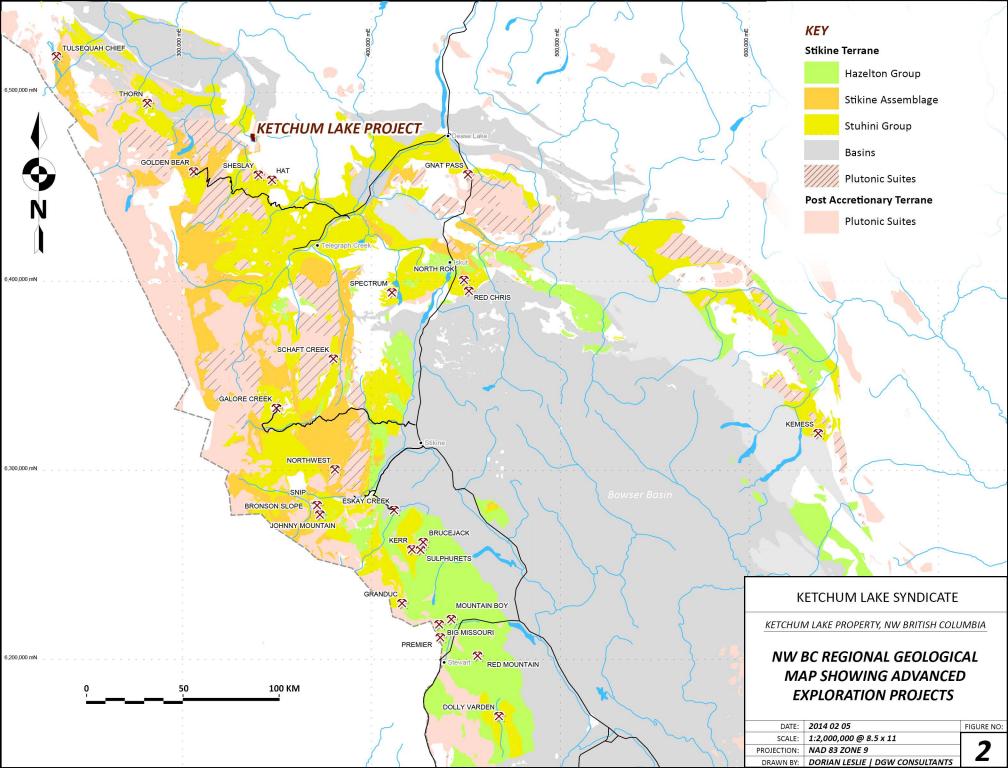
I, Carl von Einsiedel, 8888 Shook Rd., Mission, British Columbia, V2V-7N1, hereby certify that:

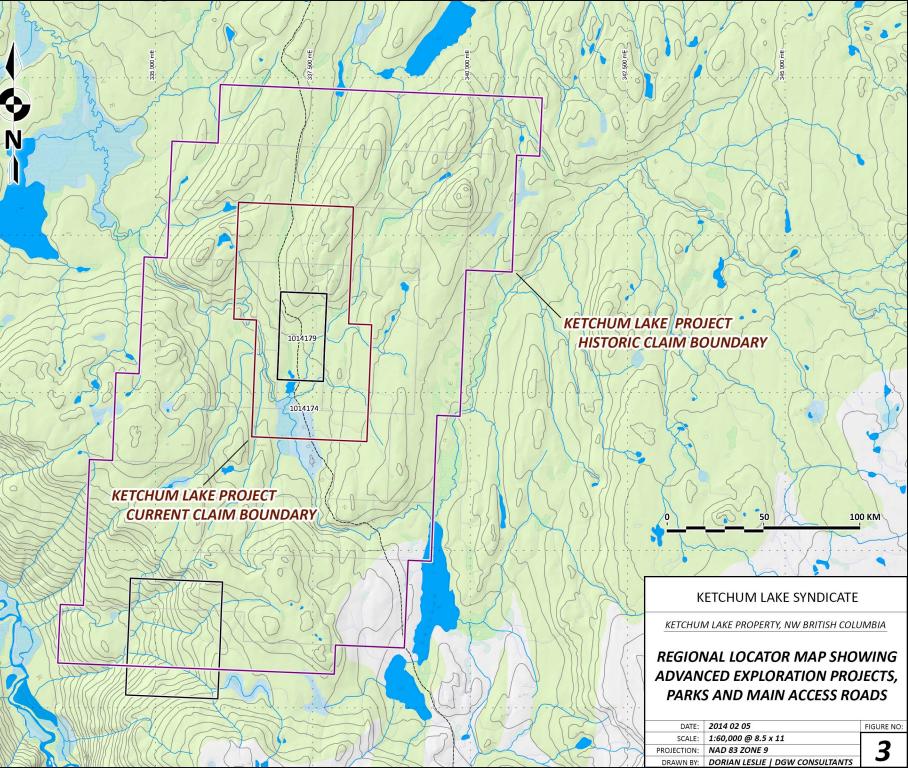
- 1) I am a consulting geologist with an office at 8888 Shook Road, Mission, BC, V2V-7N1.
- 2) This certificate applies to the "Technical Report on the Ketchum Lake Property" north western British Columbia dated December 30, 2013.
- 3) I am a graduate of Carleton University in Ottawa, Ontario, Canada in 1987 with a BSc. in Geology. I am a member in good standing of the Association of Professional Engineers and Geoscientists of the Province of British Columbia. I have practiced my profession as a geologist throughout the world continuously since 1987.
- 4) I visited the Ketchum Lake Property on August 12, 2013. I also supervised all of the exploration work carried out by Panorama Resources Ltd. between 2006 and 2010.
- 5) In the Independent "Technical Report on the Ketchum Lake Property" on the Ketchum Lake Property, I am responsible for all sections of the report.
- 6) I have read the definition of "qualified person" set out in National Instrument 43-101 and certify that by reason of education, experience, independence and affiliation with a professional association, I meet the requirements of an Independent Qualified Person as defined in National Policy 43-101.
- 7) I have had prior involvement with the Property that is the subject of this report.
- 8) I am not aware of any material fact or material change with respect to the subject matter of the technical report that is not reflected in the Technical Report.
- 9) I have read National Instrument 43-101, Standards for Disclosure of Mineral Properties. This Technical Report has been prepared in compliance with National Instrument 43-101.
- 10) As of the date of this certificate, to my the best of my qualified knowledge, information and belief, this technical report contains all the scientific and technical information that is required to be disclosed to make the report not misleading.

Dated this 30<sup>th</sup> day of December, 2013

Carl von Einsiedel, P.Geo.



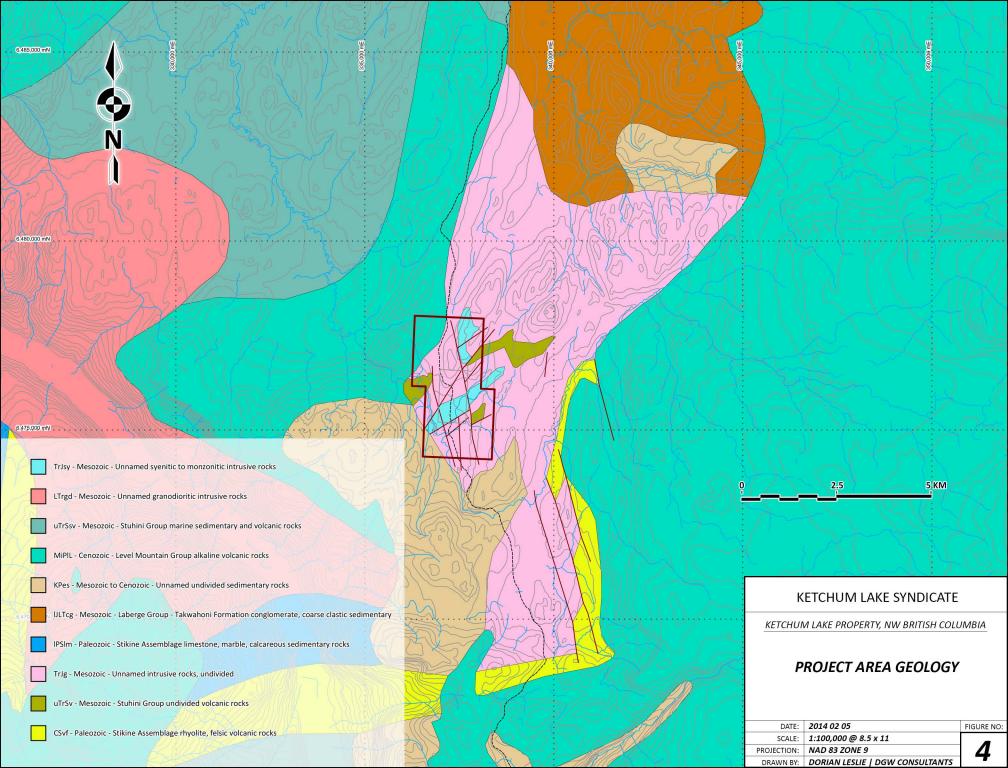


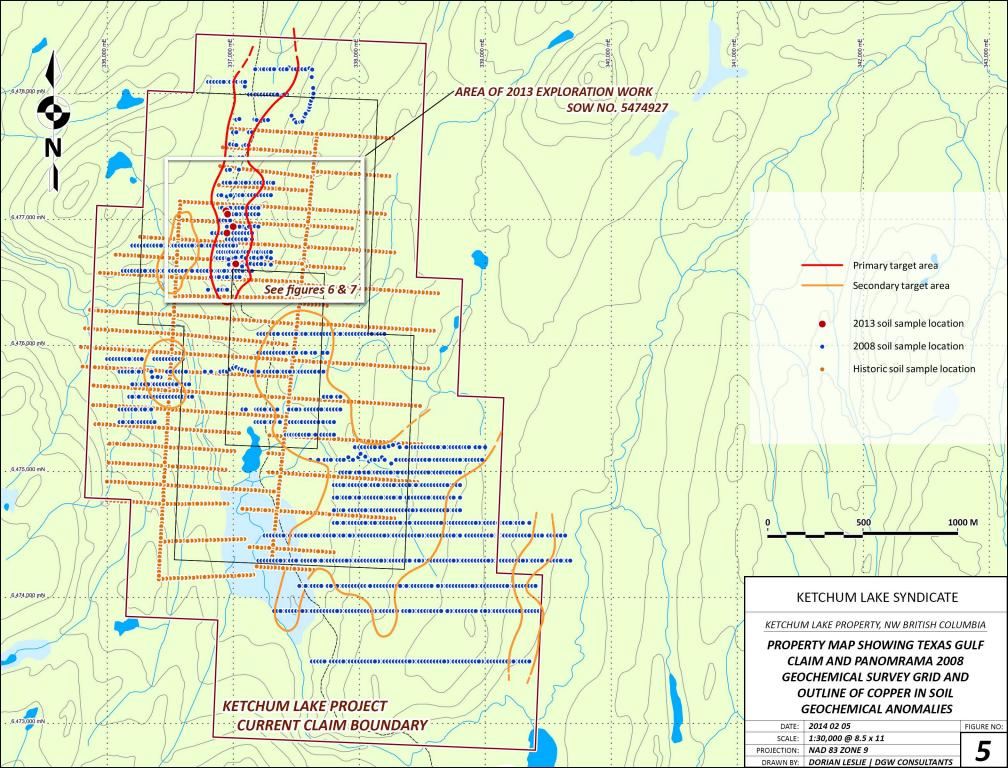


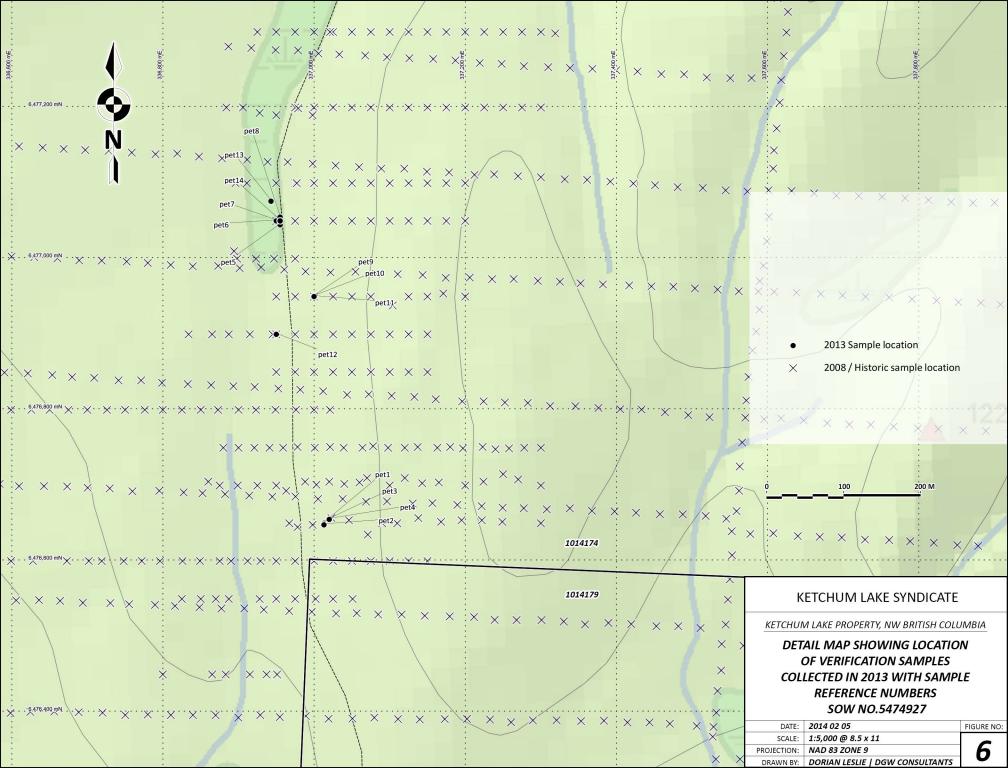
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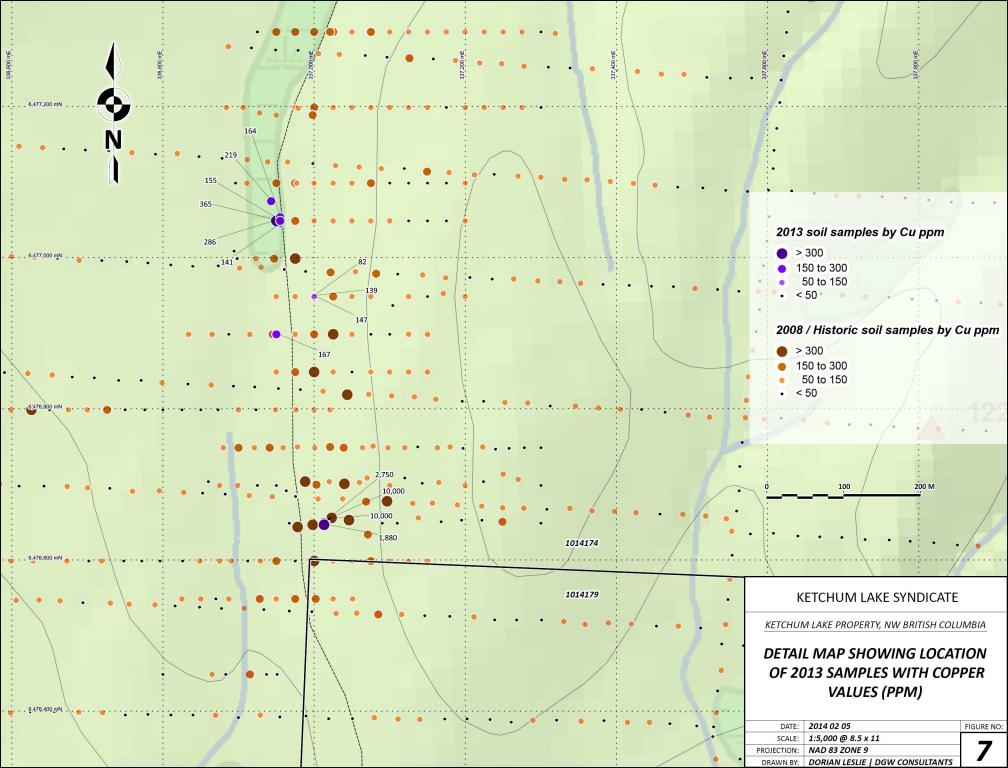
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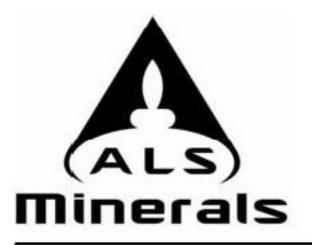
6,470,000 mN











ALS Canada Ltd.

2103 Dollarton Hwy North Vancouver BC V7H 0A7 Fax: 604 984 0218 www.alsglobal.com Phone: 604 984 0221

# CERTIFICATE VA13165936

Project: KETCHUM LAKE

P.O. No.:

This report is for 14 Soil samples submitted to our lab in Vancouver, BC, Canada on 12-SEP-2013.

The following have access to data associated with this certificate:

CARL VON EINSIEDEL		
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### RAM EXPLORATION LTD. To: ATTN: CARL VON EINSIEDEL 8888 SHOOK ROAD MISSION BC V2V 7N1

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.

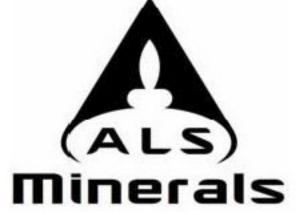
\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*

SAMPLE PREPARATION								
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	ANALYTICAL PROCEDURE	S						
ALS CODE	DESCRIPTION	INSTRUMENT						
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Signature:

Colin Ramshaw, Vancouver Laboratory Manager

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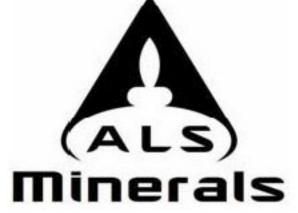
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## To: RAM EXPLORATION LTD. 8888 SHOOK ROAD MISSION BC V2V 7N1

Page: 2 - A Total # Pages: 2 (A - C) Plus Appendix Pages Finalized Date: 20-SEP-2013 Account: PJA

## Project: KETCHUM LAKE





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336950-6477050 336950-6477050 B 336955-6477055 337000-6476950 B 337000-6476950 B		<1 <1 1 <1 <1	0.11 0.11 0.08 0.16 0.19	10 10 10 10 20	1.42 1.56 1.35 0.69 0.83	429 443 357 1115 1260	<1 <1 <1 1 <1	0.04 0.04 0.03 0.01 0.01	35 42 38 24 31	1620 1500 780 850 960	8 7 7 7 7 6	0.02 0.05 0.04 0.03 0.03	- <2 <2 2 <2 <2 <2 <2	12 12 10 7 9	121 118 92 50 45	<20 <20 <20 <20 <20 <20
337000-6476950 A 336950-6476900 336943-6477076 336955-6477050		<1 <1 <1	0.19 0.09 0.11 0.09	10 10 10 10	0.90 1.24 1.48 1.05	840 689 405 323	1 <1 1	0.01 0.03 0.04 0.03	39 39 43 33	870 1150 1510 910	7 4 6 5	0.03 0.01 0.25 0.05	2 <2 <2 2	8 11 13 10	48 113 107 113	<20 <20 <20 <20

## To: RAM EXPLORATION LTD. 8888 SHOOK ROAD MISSION BC V2V 7N1

Page: 2 - B Total # Pages: 2 (A - C) Plus Appendix Pages Finalized Date: 20-SEP-2013 Account: PJA

## Project: KETCHUM LAKE





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## To: RAM EXPLORATION LTD. 8888 SHOOK ROAD MISSION BC V2V 7N1

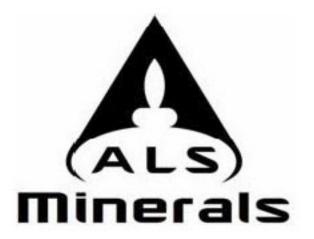
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Sample Description	Method Analyte Units LOR	ME-ICP41 Ti % 0.01	ME-ICP41 TI ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	Cu-OG46 Cu % 0.001
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ect: KETCHUM LAKE

# CERTIFICATE OF ANALYSIS VA13165936



ALS Canada Ltd.

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	CERTIFICATE COMM
Applies to Method:	LABORAT Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Cu-OG46 LOG-22 SCR-41 WEI-21

## To: RAM EXPLORATION LTD. 8888 SHOOK ROAD MISSION BC V2V 7N1

# Page: Appendix 1 Total # Appendix Pages: 1 Finalized Date: 20-SEP-2013 Account: PJA

## Project: KETCHUM LAKE

#### **CERTIFICATE OF ANALYSIS** VA13165936

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## TORY ADDRESSES

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