

# BC Geological Survey Assessment Report 35067

#### ASSESSMENT REPORT

GEOLOGICAL REPORT ON THE VOIGTBERG PROPERTY

Laird Mining Division, NTS 104G/3W 57° 03' N Latitude, 131° 19' W Longitude Northwest British Columbia, Canada



BCGOLD CORP. Suite 520, 800 West Pender Street Vancouver, BC, Canada V6C 2V6

September 12<sup>th</sup>, 2014

Prepared By:

CARACLE CREEK INTERNATIONAL CONSULTING INC. Stephen Wetherup, B.Sc. (Hon), P.Geo.



#### Office Locations

**Toronto** 

34 King Street East, 9th Floor Toronto, ON Canada, M5C 2X8

Tel: +1.416.368.1801 Fax: +1.416.368.9794 Canada@caraclecreek.com

Vancouver

409 Granville Street, Suite 1409 Vancouver, BC Canada, V6C 1T2

Tel: +1.604.637.2050 Fax: +1.604.602.9496 Canada@caraclecreek.com

Sudbury

25 Frood Road Sudbury, ON Canada, P3C 4Y9

Tel: +1.705.671.1801 TF: +1.866.671.1801 Fax: +1.705.671.3665 Canada@caraclecreek.com

**Johannesburg** 

7th Floor The Mall Offices 11 Cradock Avenue, Rosebank South Africa

Tel: +1.27 (0) 11.880.0278 Fax: +1.27 (0) 11.447.4814 Africa@caraclecreek.com

www.caraclecreek.com

This report has been prepared by Caracle Creek International Consulting Inc. (Caracle Creek) on behalf of BCGold Corp.

2014

Issued by: Vancouver Office



## TABLE OF CONTENTS

1.0	SUMMARY	<u>,</u>
2.0	INTRODUCTION	5
2.1	INTRODUCTION	5
3.0	PROPERTY DESCRIPTION AND LOCATION	
3.1	LOCATION	
4.0 PHVS	ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND IOGRAPHY	
	HISTORY	
5.0		
6.0	GEOLOGICAL SETTING AND MINERALIZATION	12
6.1	REGIONAL GEOLOGY (FROM SIMMONS, 2006)	12
6.2	PROPERTY GEOLOGY	14
6.3	STRUCTURE	15
7.0	MINERALIZATION AND ALTERATION	15
7.1	PORPHYRY AND PORPHYRY-RELATED MINERALIZATION	16
7	7.1.1 Gold Zone	16
7	1.1.2 North Zone	16
7	1.1.3 Moly Zone	18
7	7.1.4 Gossan Zone	18
8.0	EXPLORATION	19
9.0	INTERPRETATION AND RECOMMENDATIONS	20
10.0	REFERENCES	21
11.0	EXPLORATION EXPENDITURES	24
12.0	STATEMENT OF AUTHORSHIP	25



## **FIGURES**

Figure 1. Location of the Voigtberg Property in Northwestern BC, Canada	7
Figure 2. Voigtberg claim map	8
Figure 3. Regional geology in the Voigtberg area.	13
Figure 4. Voigtberg geology map with alteration zones and historical drill collars.	17
TABLES	
Table 1. Summary of Voigtberg claims	6
Table 2. Stratigraphic section for the rocks on the Voigtberg Property and surrounding area	
Tuble 2. Standstapline section for the rocks on the volgtoeig Froperty and surrounding area.	17



#### 1.0 SUMMARY

Caracle Creek International Consulting Inc. ("Caracle Creek") of Vancouver, Canada was contracted by BCGold Corporation ("BCGold"), of Vancouver, Canada, to conduct a geological assessment of the Voigtberg Property (the "Property"), and prepare an Assessment Report of its findings.

The Voigtberg property consists of eight contiguous map-selection claims covering just under 3,000 ha of mountainous terrain located 140 km northwest of Stewart in northwestern British Columbia. Access to the property is by helicopter from seasonal bases at Bob Quinn Lake airstrip on Highway 37, approximately 25 km to the east. BCGold has earned a 50% interest in the property from Kaminak Gold Corporation (Kaminak), and can earn a further 20% interest by paying cash, issuing shares and completing a bankable feasibility study. The claims are also subject to a 2% NSR royalty interest in favor of Hunter Exploration Group.

Exploration on the Voigtberg property occurred from 1984 to 1996, and recommenced in 2006 and 2007. Work prior to 2006 on the property consisted of regional stream sediment sampling, soil sampling, IP/Resistivity surveys, mapping and prospecting, surrounding the visually obvious Gossan Zone. These programs led to the discovery of three zones of interest including the Gold Zone and North Zone and culminated in drilling 3 holes in 1996. This drilling yielded anomalous Au throughout the entire length of all three holes, and an average grade over 455 m of core of 0.263 g/t.

The 2006 exploration program by Equity Exploration included data compilation, prospecting/geological mapping, channel sampling and diamond drilling (4 holes, 717 m). VGT06-05 returned an intersection of 51.15 m of 1.03 g/t Au just to the south and below the 1996 holes on the Gold Zone. Exploration in 2007 consisted of an airborne EM/Mag survey (404 line km), mapping/prospecting/soil (322) and silt (8) sampling, and drilling (4 holes, 588 m). Gold Zone drilling intersected 76.6 m of 0.22 g/t Au with 488 ppm Cu and 76.40 m of 0.40 g/t Au with 160 ppm Cu. In the North Zone, one drill hole intersected 41.3 m of 0.18 g/t Au and 0.019% Mo at the top of the hole.

A 2010 exploration program comprising 10 field days of geological mapping, prospecting and soil sampling was the most recent exploration work on the Property.

The Voigtberg Property is underlain by Upper Triassic Stuhini Group volcanic and sedimentary rocks which have been intruded by Early Jurassic Texas Creek Suite intrusions, Cretaceous to Jurassic diorite



dykes and Tertiary basaltic dykes and sills. Four styles of mineralization have been noted on the property: widespread low grade Au associated with disseminated and pyrite veinlets, molybdenite veinlets, disseminated/replacement Zn-Pb, and ENE-trending discontinuous massive pyrite veins.

In 2013, Kaminak geologist Rory Kutluoglu and Caracle Creek geologist Stephen Wetherup conducted geological assessment the Voigtberg Property including a review of the historic drill core and assessment of the identified mineral showings. This work was intended to develop a geological framework of the property and assess its potential to contain an economic porphyry deposit.

#### 2.0 Introduction

#### 2.1 Introduction

Caracle Creek International Consulting Inc. ("Caracle Creek") of Vancouver, Canada was contracted by BCGold Corporation ("BCGold"), of Vancouver, Canada, to conduct a geological assessment of the Voigtberg Property (the "Property"), and prepare an Assessment Report of its findings. The focus of this study was to assess the historical work and geology along with a geological review of the historical core and showings to evaluate the porphyry exploration potential of the property and develop additional drill targets.

### 3.0 PROPERTY DESCRIPTION AND LOCATION

#### 3.1 Location

The Voigtberg property lies in the Coast Range Mountains of northwestern British Columbia, approximately 140 km northwest of Stewart and 150 km south of Dease Lake (Figure 1). It lies within the Liard Mining Division, centred at 57° 08' north latitude and 130° 35' west longitude. The Voigtberg property consists of eight contiguous Mineral Titles Online (MTO) map-selection claims covering 2,898 ha, as summarized in Table 1. The claims do not overlap any pre-existing legacy claims (Figure 2). BCGold Corporation (BCGold) has earned a 50% interest in the property from Kaminak Gold Corporation (Kaminak), and can earn a further 20% interest by paying cash, issuing shares and completing a bankable feasibility study. The claims are also subject to a 2% NSR royalty interest in favor of Hunter Exploration Group.



Table 1. Summary of Voigtberg claims

Property	Claim #	Claim Name	Area (ha)	Record Date
Voigtberg	515585		123.008	2005/jun/19
Voigtberg	515586		1264.291	2005/jun/19
Voigtberg	516217		298.712	2005/jun/19
Voigtberg	516218	NICKY EXTENSION	17.569	2005/jun/19
Voigtberg	516219		333.964	2005/jun/19
Voigtberg	516221	NICKY EXTENSION 2	17.579	2005/jun/19
Voigtberg	549986	EASTSLOPE	421.499	2007/jan/22
Voigtberg	549987	EASTSLOPE 2	421.311	2007/jan/22
8 Claims			2897.933	

Surface rights over the Voigtberg property are owned by the Province of British Columbia. Neither significant surface disturbance nor any major environmental liabilities from past programs were noted during the 2010 exploration program. Exploration permits will be required from the British Columbia Ministry of Energy, Mines and Petroleum Resources prior to carrying out any substantial future exploration programs on the Voigtberg property such as drilling.

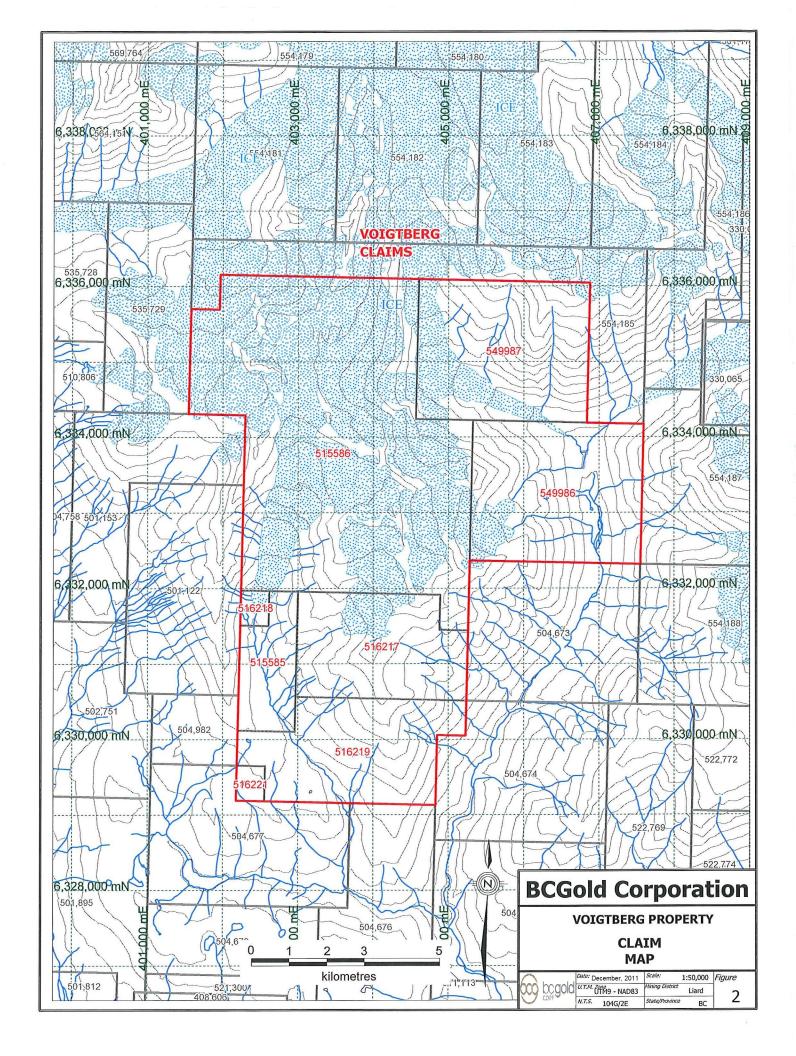
# 4.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

Access to the property is by helicopter from seasonal bases at the Bob Quinn Lake airstrip on Highway 37, approximately 25 km to the southeast. A portion of the Galore Creek Mining Corporation's all-weather access road has been constructed westward from Highway 37 and passes within 5 km of the Voigtberg property. The property covers an unnamed northerly-trending ridge on the southern shoulders of Hankin Peak, a few kilometres north of More Creek, a major tributary of the Iskut River. Topography is rugged, with elevations ranging between 1100 and 2200 m. More than half of the property is covered by glaciers and permanent snowfields. Most of the property is above treeline, which lies at about 1200 m, and is covered by alpine vegetation and rock talus. Both summer and winter temperatures are moderate although annual rainfall may exceed 200 cm and several metres of snow commonly fall at higher elevations. The property can be worked from early July until September.

#### 5.0 HISTORY

The following description of past work on the Voigtberg Property is summarized from Simmon (2006). The earliest documented work on the property was by Lac Minerals who were drawn to the area by the







prominent gossan in 1984 during a regional exploration program and took two silt samples that were not worthy of follow up at the time. In 1988 Lac went back to the area and staked the Biskut claim, in advance of an RGS sediment sampling release, and a prospecting program was carried out by Rein Turna in August of that same year. In 1989 Lac Minerals conducted a one day mapping and prospecting traverse across the gossan, describing it as a highly fractured and altered andesite, containing limonite, pyrite, carbonate and silica containing several carbonate-sericite veinlets (up to 1cm wide) with pyrite and trace galena. Two silt samples draining the area of the gossan yielded 290 ppb and 112 ppb Au. Five of the 25 rocks samples collected contained greater than 100 ppb Au, including a felsite breccia, containing approximately 10% pyrite, which graded 897 ppb Au (Brown, 1990). During the same summer field personal from Skeena Resources Limited, conducting work on the adjoining Arctic/Upper More claim group collected a grab sample from the southwestern part of the current Voigtberg property which assayed 16.1 g/t Au (Bobyn, 1990, Baker, 1992).

The claims lapsed and 344967 B.C. Ltd. re-staked it in 1990 as the Voigtberg property, before optioning it to Kingston Resources Limited in early 1991. In 1991 and 1992, two short mapping, prospecting and rock geochemistry programs focused again on the main Gossan Zone. Both programs demonstrated a northeast-trending broad area of low grade gold mineralization in heavily pyrite-carbonate altered andesitic volcanic rocks. Only two of the rock samples from the 1991 program assayed greater than 200 ppb Au, with the highest being 1.17 g/tonne Au (Cavey and Baker, 1991). The most promising results from the 1992 program came again from the area around the Gossan Zone where four samples assayed greater than 200 ppb Au, the highest of which ran 710 ppb Au and 29.5 ppm Ag (Cavey and Raven, 1992). Perhaps more encouraging was one sample taken approximately 800m to the east of the Gossan Zone that contained 0.42% Cu, in an area obscured by a glacier.

In 1993, Kingston conducted a more comprehensive exploration program consisting of grid soil geochemical sampling, grid mapping and an IP/Resistivity survey targeted at covering the area to the west and north of the Gossan Zone. During this program 9.4 line km of grid was established of which 8.9 km were surveyed by IP. This work outlined three zones of interest (Figure 3). The Gold Zone consisted of an area 300 x 200 m with >300 ppb Au in soil and a coincident chargeability high. The West Zone consisted of an area of high chargeability located about 400 m west of the Gold Zone. The West Zone contained only weakly anomalous soil geochemistry, but this may be masked by the overlying fresh limestone. A third zone of interest located immediately north of the Gold Zone, called the North Zone consists of an area covering approximately 800 x 400 m of anomalous Cu (>250 ppm) and Mo (>100 ppm) in soils



coincident with a chargeability high. Both the North Zone soil and chargeability anomalies were open to the north of the grid (Smith, 1993).

In 1994, Hayden Resources Limited optioned the Voigtberg property from Kingston and did 4.5 line km grid mapping and soil sampling. At the Gold Zone infill lines established a northeasterly trend measuring  $300 \times 50 \text{ m}$  of >1000 ppb Au in soil, within a larger area of >100 ppb Au over  $1000 \times 400 \text{ m}$  open to the northeast. At the North Zone, the pre-existing Cu/Mo soil anomaly was extended to the north by an additional 200 m to the edge of the glacier, and found to be coincident with a >200 ppb Zn in soil anomaly (Gunning, 1994).

In 1995 Hemlo Gold Mines Corporation optioned the Voigtberg property from Hayden and did more grid mapping and rock sampling to attempt to locate the source of the Au in soil anomaly identified at the Gold Zone and to locate the source of the 16.1 g/t sample reported by Bobyn (1990). An outcrop to the north of the soil anomaly at the Gold Zone was thought to be the source of the anomalous Au in soil geochemistry (Kemp, 1995). Of 24 rock samples taken, 22 were anomalous in Au, ranging from 300 ppb to 1.43 ppm. In 1996, Hayden Resources Limited conducted a diamond drilling program totaling 455 m in three drill holes from one setup. The drill site was located near the north end of the Gold Zone and was drilled away from the anomalous area. Every sample taken from the drill core was anomalous in Au, and the core averaged 0.263 g/t Au over the entire 455 m (Gunning, 1996).

No further work was done on the property till 2006, when Equity Exploration consulting to Kaminak, did data compilation, mapping, prospecting and soil sampling, and then diamond drilling and channel sampling (Simmon, 2006). Data compilation revealed that seven out of eight silt samples collected from across the Voigtberg property over the years were above the 95th percentile in at least half of the elements of interest when compared to 1,218 regional silt samples taken across the entire 104F & G map sheets by the federal/provincial RGS program (GSC, 1988). Furthermore, the comparison showed that they are broadly anomalous in all elements of interest (Au, Ag, As, Cu, Mo, Pb, Zn), except for Sb. For soil samples, percentile levels and correlation matrices were calculated for 585 samples collected from 1989-1995 by several companies. This showed that the 50th percentile levels for Au, Ag, As, Cu, Mo and Pb are all very high – likely due to the fact that these "soil" samples are mainly derived from talus fines, but also to the fact that the soil grid was established by working outward from known mineralization rather than the reverse. The correlation matrix showed a strong relationship between the elements Au, Ag, As and Cu – to be expected in a porphyry related system. A smaller correlation was found between these elements and Mo; possibly indicating the peripheral position of gold in a typical porphyry system. (Several analyses also showed that Mo may contain significant Rhenium on the property). A variable



correlation obtained with Pb, Zn and Sb may reflect their location even further outboard relative to Aupyrite zones in many porphyry systems.

Fieldwork in 2006 located a new zone of molybdenite mineralization approximately 300 m southeast of the Gold Zone, near the toe of a glacier. Eight grab samples from a 60 x 20 m mineralized zone averaged 0.211% Molybdenum, and later an average of 680 ppm Mo was returned from 35 channel samples. Soil sampling in the area of the Gold Zone confirmed the previous anomaly and located the position of the 1996 drill holes. In addition, two float samples containing chalcopyrite-covellite (0.50% and 0.25% Cu) were found which suggested the potential for significant Cu mineralization under the glacier to the NNE of the Moly and Gold Zones. Drilling during 2006 tested the Gold Zone and new Moly Zone (4 holes, 717 m). The most significant result was from drill hole VGT06-05 which yielded 1.03 g/t Au over 51.15 m immediately south and below the '96 holes on the Gold Zone. Between the Gold and Moly Zones VGT06-07 intersected 1.02% Zn over 22.5 m. VGT06-04 tested the Moly Zone but did not intersect significant molybdenum mineralization. VGT06-06 was collared at minus 45 degrees (250 m southwest of the '96 holes) on the Gold Zone and was abandoned (apparently in overburden?!) at 152 m depth with no K-spar porphyritic monzonite dikes, and no significant assays.

The 2007 program (Kutlouglu, 2008) consisted of an airborne EM/Mag survey (404 line km), mapping/prospecting/soil (322) and silt (8) sampling, and drilling (4 holes, 588 m). The surface work attempted to better delineate the context of the geology and anomalous geochemistry of the existing areas, and the potential on two newly staked claims (Eastslope) in the northeast. Unfortunately Fugro's DIGHEM V airborne survey was not completed till near the end of the 2007 field program, too late for proper ground follow-up. On the Eastslope claims 40 contour soil samples contained no significant values, although two adjacent rock samples contained anomalous Au (251-281 ppb) and As (216-226 ppb) near a monzonite dike and have not been followed up. The main objective of the 2007 drilling was to expand on the 2006 results from the Gold Zone and, for the first time, test the North Zone. On the Gold Zone, VGT07-08 tested below VGT06-06 (250 m southwest of the '96 holes) and intersected K-spar porphyritic monzonite dikes and 76.6 m of 0.22 g/t Au with 488 ppm Cu. VGT07-10 was collared 70 m east of VGT06-05 and intersected 76.40 m of 0.40 g/t Au with 160 ppm Cu. On the North Zone VGT07-09 intersected 41.3 m of 0.18 g/t Au and 0.019% Mo at the top of the hole, with no monzonite dikes observed. A second test of the North Zone was attempted by VGT07-11, but had to be abandoned.

In 2010, BCGold completed additional prospecting and soil sampling on the property comprising 160 rock and 14 soil samples.



#### **6.0 GEOLOGICAL SETTING AND MINERALIZATION**

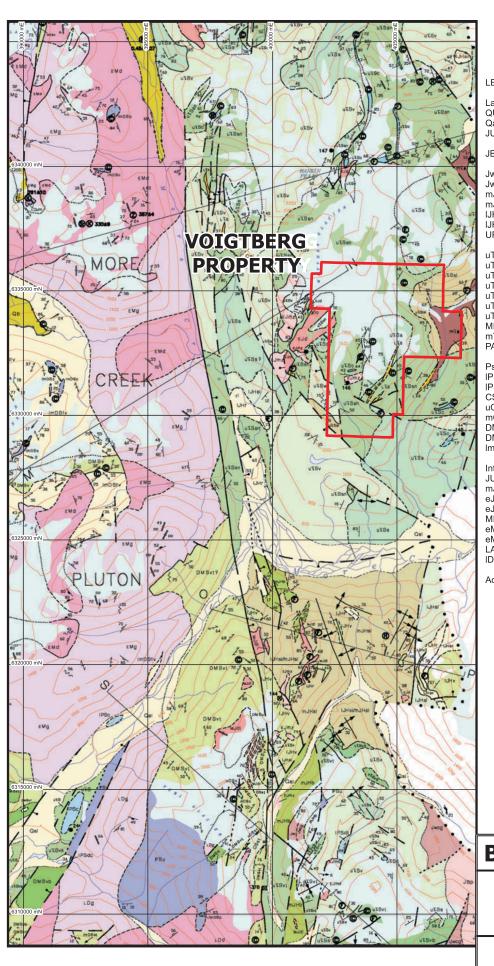
#### 6.1 Regional Geology (from Simmons, 2006)

The regional geology surrounding the Voigtberg claims consists of mid-Paleozoic and Mesozoic island arc successions which are overlapped to the east by clastic sediments of the Bowser Basin (Figure 3). Regional mapping has been carried out at a scale of 1:50,000 by Logan et al (1990a, b; 1992a, b; 1997) of the BCGS and by Read et al (1989) of the GSC. Recent mapping has been done in the Voigtberg area by the B.C. Geological Survey (Alldrick et al, 2005).

The Paleozoic Stikine Assemblage lies entirely west of the Forrest Kerr Fault, with Mesozoic rocks exposed to the east. The Stikine Assemblage is unconformably overlain by island arc volcanic and sedimentary rocks of the Upper Triassic Stuhini Group. At the base of the Stuhini Group is a thick package of fine-grained volcaniclastic and sedimentary rocks, dominated by volcanic wacke, arenite and interbedded siltstone and argillite. These units inter-finger with overlying massive green tuff.

The Early to Middle Jurassic Hazelton Group unconformably overlies the Stuhini Group, and comprises five regional units (MacDonald et al, 1996). A basal coarse clastic unit is a few tens or hundreds of metres thick, overlying the Stuhini Group along a disconformity or angular unconformity conformably overlain by a sequence of andesitic to dacitic volcanic rocks, characterized by extensive variations in thickness and facies. The intermediate volcanic and volcaniclastic strata are locally overlain by regionally discontinuous felsic calc-alkaline volcanic flows and tuffs. An overlying sedimentary unit is distinguished from the basal unit by the absence of the granitoid clast conglomerate and by clasts derived from the underlying intermediate volcanic packages. The Upper Sequence of the Hazelton Group is dominantly a bimodal tholeitic volcanic assemblage with lesser tuffaceous, calcareous and argillaceous rocks, thought to represent intra-arc rifting. Middle to Upper Jurassic Bowser Lake Group marine and terrestrial mudstones, sandstones and conglomerates conformably overlie the Hazelton Group. These basinal clastic units lack volcanic components and contain clasts of rock types from adjacent terranes, indicating a change in the local and regional tectonic setting (Roth et al, 1999).

A belt of Early Jurassic Texas Creek calc-alkaline, hornblende granodiorite and quartz monzonite to alkaline, potassium feldspar megacrystic monzogranite plutons trends northwest from Stewart to the Scud River area. Logan et al (1998) includes a northeast-trending monzonite plug on the Voigtberg property and a monzonite to syenite stock immediately west of the Voigtberg property with the Texas Creek suite.



#### LEGEND

Layered Rocks QUATERNARY Qal Till and alluvium JURASSIC

Bowser Lake Group Greywacke, shale and sandstone Hazelton Group

Siliceous siltstone Jwcg Polylithic conglomerate

mJHsl Siltstone, sandstone, crystal tuff

mJHb Pillow basalt, breccia and tuff

IJHv Andesite and dacite IJHr Rhyolite UPPER TRIASSIC

Stuhini Group uTS Undifferentiated volcanics and sediments

uTSvt Lapilli and crystal tuff

uTSvbPlagioclase-phyric basalt flows

uTSv Tuff and epiclastics

uTSs Volcaniclastic sandstone

uTSsc Limestone

uTSsnSandstone, conglomerate and siltstone MIDDLE TRIASSIC

mTs Shale, sandstone and siltstone

PALEOZOIC

Stikine Assemblage

Undifferentiated foliated volcanics and sediments

IPSc Fossiliferous carbonate

IPSdt Intermediate siliceous tuff and sediments

CSst Siltstone, argillite and phyllite/tuff uCSc Dolomitic limestone mCSc Bioclastic limestone

DMSs Undifferentiated foliated sediments DMSvtSiliceous ash tuff and mafic tuff

ImDScMarble and limestone

Intrusive Rocks

JURASSIC

mJdi Diorite, pyroxene gabbro

eJd Augite-plagioclase diorite and gabbro eJmz Monzonite

MISSISSIPPIAN

eMd Hornblende diorite and quartz monzonite

eMg Biotite granite

LATE DEVONIAN

IDd Hornblende diorite and quartz diorite

Adapted from Logan et al (1997).

4 kilometres

# **BCGold Corporation**

**VOIGTBERG PROPERTY REGIONAL GEOLOGY** 

	Date: FEB 2008	Scale: as shown	F
.,	U.T.M. Zone UTM 9 - NAD83	Mining District LIARD	
	N.T.S. 104G/2E	State/Province BC	1



Throughout the region, a number of Cu-Au porphyry prospects (e.g. Kerr, Bronson Slope) and precious metal vein deposits (e.g. Silbak Premier, Snip and Brucejack) are related to Texas Creek intrusions.

#### 6.2 Property Geology

As per Simmons (2006), the Voigtberg property rock types are described in Table 2. The Voigtberg Property covers an area of Triassic accreted marine sedimentary and volcanic rocks of the Stuhini Group, which have been intruded by at least two generations of feldspar porphyry dykes and stocks of unknown ages. Only a limited amount of detailed geological mapping has taken place on the Voigtberg property, mainly confined to the area where the soil sampling grid was established in the 1990's. As a consequence, the stratigraphic and intrusive age relationships between the rock units are very poorly understood at a property scale.

Table 2. Stratigraphic section for the rocks on the Voigtberg Property and surrounding area.

TIN – Intrusive dykes and sills

TIN1

Basalt: fine-grained, aphanitic, dark green-grey; typically narrow (<3m wide) dykes; rare fine grained hornblende phenocrysts, often following late brittle structures (055 deg)

#### CRETACEOUS TO JURASSIC

JKIN - Intrusive dykes, sills and stocks

JKIN1

Diorite to monzonite: plagioclase and hornblende porphyritic, up to 40% sericite altered anhedral sub-rounded plagioclase, minor biotite phenocrysts; fine-grained brown matrix

#### **EARLY JURASSIC**

#### Texas Creek Suite Intrusive Rocks (ca. 193Ma)

MJmz

Monzonite to Syenite: coarse-grained, K-feldspar-hornblende porphyry, K-feldspar megacrystic containing euhdral 1 cm x 5 mm to megacrystic tabular (3 cm x 6cm) feldspar crystals; dark grey-green fine-grained matrix containing k-feldspar and plagioclase

#### **UPPER TRIASSIC**

#### Stuhini Group

uTMV - Mafic volcanic rocks

uTMV1 Andesitic tuff: dark grey-green; well bedded; fine-grained; crystal-rich; contains up to 30% crystal components mainly of plagioclase hornblende and biotite; rare lithic fragments

uTMV2 Massive andesite flows: medium to dark grey-green, euhedral plagioclase phenocrysts (up to 3mm long); minor subhedral biotite crystals; rare aphyric flows; local oblate pillow structures

uTMV3 Dacite lapilli tuff: light grey-dark green, contains up to 15% fine lapilli sized fragments of fine grained aphanitic andesite; up to 15% euhedral quartz crystal fragments up to 3mm wide

uTMV4 Massive dacite flows: dark grey-green, flow foliations variably developed; contains 5-10% euhedral quartz phenocrysts; rarely feldspar phyric; local spheriolites

uTMV5 Rhyolitic flows: light grey-green, well developed flow foliations; commonly aphanitic with rare K-feldspar and quartz phenocrysts; local spheriolites; often associated with minor rhyolitic ash fall units;

#### uTMS - Marine sedimentary rocks

September 12th, 2014

uTMS1 Calcareous sandstone and siltstone: green to brown medium- to coarse-grained; lacks well developed bedding

uTMS2 Calcareous conglomerate: polymictic; clast supported; rounded to subrounded pebble to boulder sized clasts; contains mainly sedimentary clasts with lesser volcanic clasts



uTMS3 Pebbly siltstone: green to brown siltstone containing auspicious pebble sized fragments of an unknown origin
uTMS4 Limestone: light grey and buff; well preserved; fossiliferous; local recrystallization and marble development associated with monzonitic intrusions

uTMS5 Shale: very dark grey-green to black; well laminated; very fine grained; often interlayered with fine-grain sandstone units; graded bedding is common

In addition to the volcanic and intrusive units listed in Table 2, lamprophyre dykes were noted on the property and either strike 130 and dip 75° SW or 225 and dip 70°NW.

#### 6.3 Structure

A major northwesterly-trending structure has been inferred for at least six km along Voigtberg Creek, marked by a prominent lineament. This structure juxtaposes Stuhini Group rocks dominated by clastic sedimentary rocks to the northeast and Stuhini Group rocks dominated by submarine mafic volcanic rocks to the southwest. Lesser northeasterly trending faults, such as those outcropping in Gossan Creek, may have acted as pathways along which Jurassic and later intrusions were emplaced, as seen by their northeasterly trends.

Stuhini Group volcanic and sedimentary rocks generally strike northeasterly and are moderately dipping northwest and southeast. These units are open to closely folded, and fold axes shallowly plunge to the north. There are at least two dominant sets of pre-mineralization fractures which are associated with higher concentrations of sulphide minerals, particularly pyrite in the Gold zone. These sets are steeply dipping, trending 045° and 300°, and are present in higher abundance in Stuhini Group rocks adjacent to early Jurassic intrusive rocks. These fractures are also present in mineralized intrusive rocks, suggesting that mineralization is syn- or post- intrusion emplacement.

#### 7.0 MINERALIZATION AND ALTERATION

Exploration on the Voigtberg property has been directed at two styles of mineralization (1) porphyry Cu-Mo-(Au) style mineralization; and (2) low grade disseminated Au mineralization. Both of these are related within a porphyry setting.

The main target of interest on the Voigtberg property has been the low grade disseminated Au mineralization, which is centred on a large (~700 x 500 m) greater than 500 ppb gold in soil anomaly.



#### 7.1 Porphyry and Porphyry-Related Mineralization

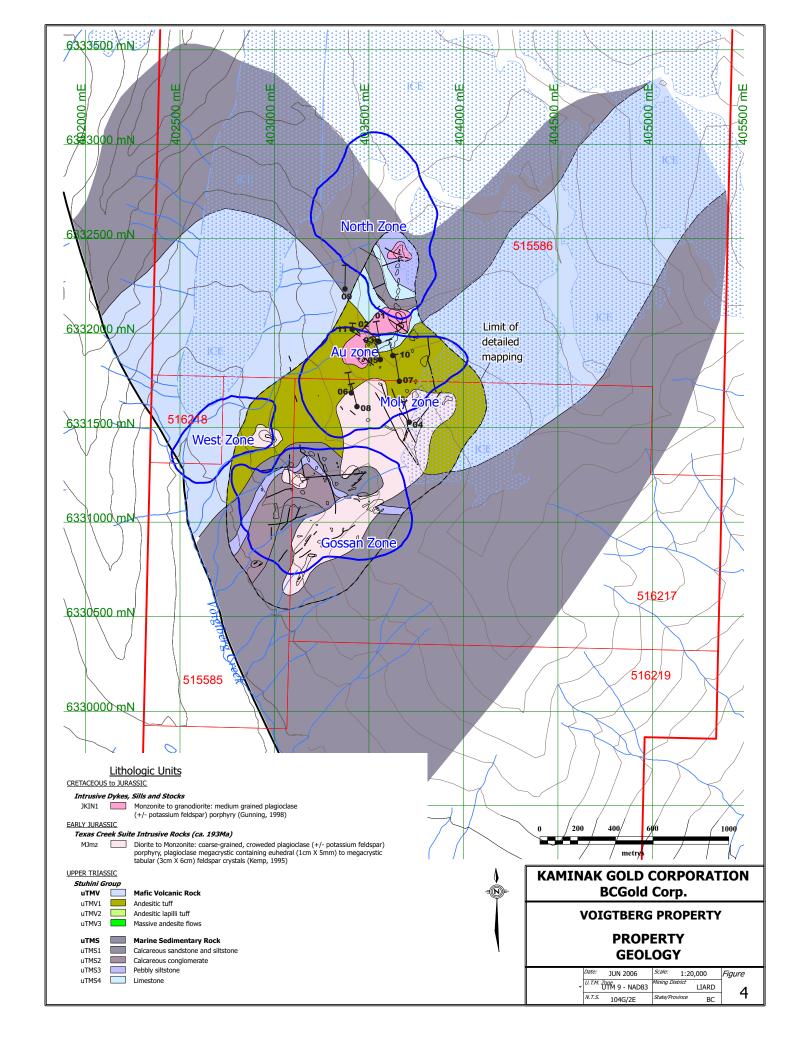
Mineralization and alteration are spatially related to Jurassic Texas Creek Suite orthoclase megacrystic monzonite. While many rock units host mineralization in the zones, Triassic Stuhini Group rocks are better mineralized. Overall the mineralized zones of the North, Gold, Moly and Gossan zones comprise an area of 2500 x 1200 m of continuously mineralized volcanic and intrusive rocks containing low grade disseminated Au and lesser Cu (Figure 4).

#### 7.1.1 Gold Zone

The Gold Zone covers a northeast elongated 400 x 650 m area that is coincident with a >300 ppb Au in soil anomaly and a chargeability high. The Gold Zone is bound to the east by glacial cover, to the southeast by a zone of argillically altered intrusive rock (Gossan Zone) and to the southwest by an area of unaltered limestone. The Zone is comprised of sericite, carbonate, chlorite altered andesite and dacite lapilli tuff with disseminated and fracture coated pyrite. Early K-feldspar alteration has been overprinted by a later and lower temperature alteration assemblage. Extensive talus cover limits mapping and interpretation of mineralization and alteration in this zone. The area contains several narrow NNEtrending K-feldspar megacrystic dykes. Gold values in this area are typically >50 ppb with higher grade zones such as hole VGT07-10 that intersected 0.40 g/t Au over 76.40 m and VGT07-08 with 76.62 m containing 0.22 g/t Au. Silver and base metals tend to be only slightly anomalous in this area. Molybdenum is slightly anomalous in this area, generally assaying <50 ppm, however very local soil samples range up to 580 ppm Mo. Pyrite occurs both disseminated and as fracture coatings, with higher concentrations of pyrite occurring where fractures are most intense. These fractures trend 300° and 045°. More importantly, pyrite is associated with low temperature sericite, carbonate, chlorite alteration assemblages. Additionally, As and Hg tend to be fairly low and somewhat sporadic in this area, but are generally slightly elevated compared to other mineralized areas on the property.

#### 7.1.2 North Zone

The North Zone covers a north-south elongated 900 x 600 m area that is coincident with a >100 ppb Au >100 ppm Mo and >250 ppm Cu in soil anomaly and a chargeability high. The area is bound to the north, east and west by glacial cover, to the south by a zone of propyllitically altered andesitic volcanic rocks. The North Zone has extensive talus cover and extreme topography making exploration difficult in this area. From the limited amount of work done in the North Zone, it appears similar in terms of alteration and mineralization style to the Gold Zone, aside from northwest trending shear-hosted Cu-sulphides.





However, the area has distinct soil geochemistry. Similar to the Gold Zone, Au in soil is consistently greater than 100 ppb through the whole zone but is coincident with increases in Cu, Mo and to some extent Ag. Mapping and prospecting showed that the area is largely underlain by the feldspar megacrystic monzonite, with minor diorite dykes also present on the northeast edge of the zone. These rocks have intruded into a series of massive andesitic flows and lapilli tuffs and smaller intervals of dacite flows and lapilli tuffs. There are also minor limestone units that have been noted throughout the property, but rarely seen in the North Zone. One of these blocks is the site of sample 200994, which appears to be a banded limestone in a very small outcrop. The bands in the limestone (marble?) contain fine-grained pyrite and very fine-grained black sphalerite. Mineralization and alteration were limited to narrow NNE-trending structures which consisted of pyritic veins, fracture coatings and disseminations within sericite-carbonate and lesser K-feldspar altered andesitic rocks. Over 40 grab and float samples have been taken in and immediately surrounding the North Zone, in conjunction with a single drill hole (VGT07-09) in the southern part of the zone. The samples that contain anomalous gold or copper also contain anomalous molybdenum, lead or zinc values.

#### 7.1.3 Moly Zone

The Moly Zone covers an area of 200 x 100 m and consists of K-feldspar-sericite-(±biotite) altered flow banded dacite, which has been intruded by several narrow NE-trending orthoclase megacrystic monzonite dykes. Within this zone is an area of molybdenite mineralization covering a surface area of 60 x 20 m which is covered by glacial ice to the northeast. Mineralization consists mainly of fracture coated and disseminated very fine-grained molybdenite with lesser sphalerite, chalcopyrite and galena. The sulphide minerals are concentrated along fractures and also along flow foliation surfaces within dacitic units. As is the case at the Gold Zone, K-feldspar megacrystic dykes are not as well mineralized as the surrounding Stuhini Group volcanic rocks. Two float samples taken in the Moly Zone area yielded 1.78 g/t Au & 0.247% Cu and 135 ppb Au & 0.49% Cu. These samples were taken adjacent to the toe of a glacier from rounded to subrounded boulders containing disseminated pyrite and chalcopyrite. These boulders probably represent mineralization under the glacier further up valley in the vicinity of the eastern edge of the North Zone soil anomaly.

#### 7.1.4 Gossan Zone

The Gossan Zone covers an elongated 800 x 600 m area within which a prominent limonitic gossan extends for at least 300 m. The area immediately north of the Gossan Zone is dominated by unaltered limestone, which masks the underlying alteration and mineralization. The areas to the south and east are



dominated by K-feldspar-biotite-dickite altered rhyolite and dacitic flows of the Stuhini Group and several K-feldspar megacrystic monzonite intrusions. Mapping in the western portion of the anomaly is severely limited by glacial till cover and alpine grasses and shrubs. Local vuggy textures were noted while mapping in this area. Within the gossanous area several narrow (maximum thickness of 1.5 m), ~260°-trending, moderately north dipping, discontinuous, pinching and swelling massive sulphide veins are present. These veins are comprised mainly of pyrite with lesser sphalerite and rare galena and chalcopyrite. Given the veins' orientation, spatial relationship to other known mineralization styles, associated alteration assemblages and polymetallic geochemistry these veins may represent polymetallic veins which developed in a lithocap environment or peripheral to porphyry Cu-Mo style mineralization.

#### 8.0 EXPLORATION

On August 4<sup>th</sup>, 2014, Rory Kutuoglu (Kaminak) and Stephen Wetherup (Caracle Creek) examined historical drill core and the four main mineralized zones on the Voigtberg Property in an effort to better understand the geological framework and alteration patterns in these zones to develop future porphyry Cu-Au drill targets.

Previous work has focused on the geochemical soil anomalies which identified several Au+/-Cu+/-Mo target areas and shallowly drill tested the Gold Zone and a single hole in the North Zone. These holes intersected weak gold mineralization locally similar to rocks seen on the surface but left many unanswered questions as to where economic porphyry mineralization may occur.

Core from the Gold Zone was reviewed from which the following observations were made:

- 1. Au mineralization surrounds megacrystic monzonite dykes and diminishes with distance from these dykes over 10-40 m,
- 2. Copper mineralization is weak and sporadic and occurs within more mafic volcanic phases as well as within the megacrystic monzonite.
- 3. Where mineralized the megacrystic monzonite is intensely K-feldspar altered with abundant disseminated pyrite and pyrite veinlets, but no magnetite (unusual for gold-rich porphyry systems).
- 4. Mineralization is localized to intrusive margins and alteration dissipates over relatively short distances within the drilling. This suggests that although some of the dykes observed may have introduced Au+/-Cu mineralization they are peripheral to the core of the system.



A traverse from the Gold Zone (Collar VG07-08) to the North Zone (Collar VG07-09) was completed and then down to the Moly Zone. Outcrop and talus from the North and Gold Zones showed little variability to the alteration observed in the drill core. The rocks are heavily pyritized with local K-feldspar flooding in generally a sericite-chlorite-pyrite+/-clay alteration assemblage which dominates the system.

The Moly Zone and molybdenum in the soil data occurs within more calcareous units within the stratigraphy. In the Moly Zone a few molybdenite smears within a impure limestone to calcareous tuffaceous unit occur with very weak alteration comprised mainly of pyritization. Importantly, no skarn minerals other than minor epidote were found suggesting that the mineralization occurred at a fairly low temperature and much like the North and Gold Zones is peripheral to a porphyry centre.

The Gossan Zone is comprised of a high-level clay altered (dickite according to previous reports) and highly limonitic zone which appears to be an advanced argillic alteration sequence (clay mineral analysis is required). Alteration in this area appear to be more pervasive and although high-level relatively hotter in comparison to the Gold and North Zones.

#### 9.0 Interpretation and Recommendations

The Gold and North Zones on the Voigtberg Property appear to sporadically mineralized and altered, gold dominated zones peripheral to a Cu-Au porphyry system. The Gossan Zone contains more pervasive albeit high-level (epithermal) clay alteration could suggest that a "core" to the system if it exists occurs below this zone to depth.

Understanding the orientation of bedding is critical in tilted porphyry systems for interpreting the location of alteration assemblages within the systems and this is not understood well from historical work on the property. From this fieldwork, it appears that stratigraphy dips southward in the Voigtberg valley and that the Gossan Zone is stratigraphically higher that the Gold, North and Moly Zones even though they are currently at a higher elevation at the head of the valley. If this is the case, then the hydrothermal system plunges northward and previous fracture data collection by Simmons (2006) would suggest a steep NE plunge. Additional structural work is required to properly determine the structural setting of the system.

Alteration mapping has also not been completed historically, however from preliminary alteration observations from this brief study, the most pervasive and intense alteration appears to occur in the Gossan Zone where no historical drilling has occurred. It is certainly high-level, almost epithermal



alteration, but if this area represents the top of a hydrothermal core drilling to depth (assuming a NE plunge) within and northeast of the zone may discover the centre of the hydrothermal system and hopefully the best and most consistent Cu-Au grades.

#### 10.0 REFERENCES

- Alldrick, D.J., Nelson, J.L., and Barresi, T. (2005): Geology of the Volcano Creek-More Creek Area, British Columbia, NTS 104B/8,9,10,15,16, 104G/1,2: B.C. Ministry of Energy and Mines, Open File 2005-5, 1:50,000 scale map.
- Alldrick, D.J., Stewart, M.L., Nelson, J.L., and Simpson, K.A. (2004): Tracking the Eskay Rift through northern British Columbia: Geology and mineral occurrences of the Upper Iskut River area: (Telegraph Creek NTS 104G/01,02,07,08,09,10): B.C. Ministry of Energy and Mines, Geological Fieldwork 2003, Paper 2004-1, pp 1-18.
- Anderson, R.G. (1993): A Mesozoic Stratigraphic and Plutonic Framework for Northwestern Stikinia (Iskut River Area), Northwestern British Columbia, in Mesozoic Paleogeography of the Western United States, Society of Economic Paleontologists and Mineralogists, Pacific Section, v. 91, pp. 477-494.
- Baker, N.W. (1992): Prospecting Report on the Voigtberg Project; British Columbia Ministry of Energy and Mines Assessment Report #22,507.
- Bobyn, M.G. (1990): Assessment Report on Geological Mapping, Prospecting and Geochemistry of the Arctic/Upper More Claims; British Columbia Ministry of Energy and Mines Assessment Report #20,667.
- Bobyn, M.G. (1991): Summary Report on Geological Mapping, Prospecting and Geochemistry of the Arctic/Upper More Claims; British Columbia Ministry of Energy and Mines Assessment Report #21,529.
- Britton, J.M., J.D. Blackwell and T.G. Schroeter (1990): #21 Zone Deposits, Eskay Creek, Northwestern British Columbia, in Exploration in British Columbia 1989; British Columbia Ministry of Energy and Mines, p. 197-223.
- Brown, R. F. (1990): Report on the Rock Geochemical Sampling in the Biskut Claim; British Columbia Ministry of Energy and Mines Assessment Report #19,605.
- Cavey, G. and Baker, N. (1991): Report on the Voigtberg Project for Kingston Resources Ltd., Liard Mining Division; June 29.
- Cavey, G. and Raven, W. (1992): Report on the Voigtberg Project for Kingston Resources Ltd., Liard Mining Division; August 4.



- Childe, F. (1996): U-Pb Geochronology and Nd and Pb Isotope Characteristics of the Au-Ag-Rich Eskay Creek Volcanogenic Massive Sulfide Deposit, British Columbia; Economic Geology, pp. 1209-1224.
- Geological Survey of Canada (1988): National Geochemical Reconnaissance 1:250,000 Map Series (Sumdum/Telegraph Creek); Open File 1646.
- Gunning, D.R. (1994): Voigtberg Property 1994 Field Program; British Columbia Ministry of Energy and Mines Assessment Report #23,626.
- Gunning, D.R. (1996): Report on the 1996 Diamond Drilling Program on the Voigtberg Property; British Columbia Ministry of Energy and Mines Assessment Report #24,937.
- Gunning, D.R. (1998): Summary Report on the Voigtberg Property; Internal Report for Magnum Ventures Limited, June, 1998.
- Jones, B.K. (1992): Application of Metal Zoning to Gold Exploration in Porphyry Copper Systems; Journal of Geochemical Exploration; vol. 43, pp. 127-155.
- Jones M.I. and Simmons, A.T. (2006): 2006 Summary Report on the Voigtberg Property; Private report for BCGold Corporation, dated July 28, 2006, see www.sedar.com for technical report on Kaminak's Voigtberg Property, 33 pages
- Kemp, R. (1995): Geological and Geochemical Report on the Voigtberg Property; British Columbia Ministry of Energy and Mines Assessment Report #24,189.
- Kutluoglu, R. (2008): 2007 Geochemical and Geological Report on the Voigtberg Property; British Columbia Ministry of Energy and Mines Assessment Report #29,682.
- Leitch, C.H.B. (1996): Petrographic Report on 4 Polished Thin Sections; Private report for Hayden Resources Ltd., dated October 16, 1996. In D.R. Gunning (1996): Report on the 1996 Diamond Drilling Program on the Voigtberg Property.
- Logan, J.M., J.R. Drobe and D.C. Elsby (1992a): Geology of the More Creek Area, Northwestern British Columbia (104G/2), in Geological Fieldwork 1991; British Columbia Ministry of Energy and Mines Paper 1991-1, p. 161-178.
- Logan, J.M., J.R. Drobe and D.C. Elsby (1992b): Geology, Geochemistry and Mineral Occurrences of the More Creek Area, Northwestern British Columbia; British Columbia Ministry of Energy and Mines Open File 1992-5, map at 1:50,000 scale.
- Logan, J.M., V.M. Koyanagi and J.R. Drobe (1990a): Geology and Mineral Occurrences of the Forrest Kerr - Iskut River Area, Northwestern British Columbia; British Columbia Ministry of Energy and Mines Open File 1990-2, map at 1:50,000 scale.

September 12<sup>th</sup>, 2014



- Logan, J.M., V.M. Koyanagi and J.R. Drobe (1990b): Geology of the Forrest Kerr Creek Area, Northwestern British Columbia, in Geological Fieldwork 1989; British Columbia Ministry of Energy and Mines Paper 1990-1, p. 127-139.
- Logan, J.M., J.R. Drobe, V.M. Koyanagi and D.C. Elsby (1997): Geology of the Forrest Kerr Mess Creek Area, Northwestern British Columbia; British Columbia Ministry of Energy and Mines Geoscience Map 1997-3, map at 1:100,000 scale.
- Logan, J.M., J.R. Drobe and W.C. McLelland (1998): Geology of the Forrest Kerr Mess Creek Area, Northwestern British Columbia; British Columbia Ministry of Energy and Mines Bulletin 104.
- MacDonald, A.J., P.D. Lewis, J.F.H. Thompson, G. Nadaraju, R.D. Bartsch, D.J. Bridge, D.A. Rhys, T. Roth, A. Kaip, C.I. Godwin and A.J. Sinclair (1996): Metallogeny of an Early to Middle Jurassic Arc, Iskut River Area, Northwestern British Columbia; Economic Geology, p. 1098-1114.
- Mauler, A. & Thompson, A.J.B. (2006): Petrographic Report of 16 Samples: Voigtberg Project, B.C.; Private Report for Equity Engineering Ltd., dated December 15, 2006.
- Read, P.B., R.L. Brown, J.F. Psutcka, J.M. Moore, M. Journeay, L.S. Lane and M.J. Orchard (1989): Geology of parts of Snippaker Creek (104B/10), Forrest Kerr Creek (104B/15), Bob Quinn Lake (104B/16), Iskut River (104G/1) and More Creek (104G/2); Geological Survey of Canada Open File 2094, 2 maps at 1:50,000 scale.
- Roth, T., J.F.H. Thompson and T.J. Barrett (1999): The Precious Metal-Rich Eskay Creek Deposit, Northwestern British Columbia, in Volcanic-Associated Massive Sulfide Deposits: Processes and Examples in Modern and Ancient Settings; Reviews in Economic Geology, Volume 8, p. 357-373.
- Simmons, A. (2006): 2006 Geochemical and Geological Report on the Voigtberg Property; British Columbia Ministry of Energy and Mines Assessment Report #28,837.
- Smith, S.W. (1993): Geological, Geochemical and Geophysical Report on the Voigtberg Property British Columbia Ministry of Energy and Mines Assessment Report #23,117.
- Souther, J.G. (1972): Telegraph Creek Map Area, British Columbia; Geological Survey of Canada Paper 71-44.



## 11.0 EXPLORATION EXPENDITURES

Table 3. Exploration expenses

Tubic 3. Exprorumon expe						Rate per	
Exploration Work type	Company/Personnel	No.		Amt	Units	Unit	Totals
Geological Assessment/Ma	pping						
Field Labour	S. Wetherup (July 15-16, 2013)	1	X	2.0	days	\$900.00	\$1,800.00
Field Labour	R. Kutloulglu (July 15-16, 2013)	1	X	2.0	days	\$900.00	\$1,800.00
Field Expenses							
Accomodation and Board	Bell 2	2	X	2.0	days	\$80.00	\$320.00
Truck rental		1	X	2.0	days	\$250.00	\$125.00
Fuel					•		\$500.00
Helicopter	Lakelse	1		3.0	hours	\$1,864.33	\$5,592.98
Airfare	S. Wetherup	1					\$250.00
Report Writing Writing and geological							
interp.	Caracle (S. Wetherup)			2.0	days	\$900.00	\$1,800.00
Map production	Caracle (G.Nixon)			1.0	days	\$660.00	\$660.00
							\$12,847.98



#### 12.0 STATEMENT OF AUTHORSHIP

Stephen William Wetherup 9253 164<sup>th</sup> Street Surrey, British Columbia Canada, V4N 3C9

Telephone: 604-217-1900

Email: swetherup@caraclecreek.com

#### CERTIFICATE OF AUTHOR

- I, Stephen Wetherup, do hereby certify that,
  - 1. I am a graduate of the University of Manitoba ((Winnipeg) with a B.Sc. Honours in Geology.
  - 2. I am a member of the Association of Association of Professional Engineers and Geoscientists of British Columbia (APEGBC, #27770) and Association of Professional Geoscientists of Ontario, (APGO#1705). I am a member of the Society of Economic Geologists and the Vancouver Mining Exploration Group.
  - 3. I have been operating a business as a geological consultant under my own name since June, 2001, and under the name of Caracle Creek International Consulting Inc. since March, 2004.
  - 4. I am independent of both Kaminak and BCGold Corp and have no finaincial interest in either company nor do I expect to receive any.
  - 5. I am responsible for the preparation of the Report titled "Assessment Report: Voigtberg Property, Laird Mining Division, British Columbia", (the "Report"), dated September 12<sup>th</sup>, 2014..

Dated this 12<sup>th</sup> Day of September, 2014.

Stephen William Wetherup,

BSc., P.Geo. (APEGBC, #27770)