

# RICHARD BILLINGSLEY

*(Owner & Operator)*

## GEOLOGICAL ASSESSMENT REPORT

*(Event 5465947)*

*on a*

## STRUCTURAL ANALYSIS

*on*

**Tenures 559067 & 559068**

*of the 18 Tenure*

**Porcupine 559067 Claim Group**

**Nicola Mining Division**

**BCGS Maps 092H.097/.098, 092I.007/.008**

*Dates of work*

**August 1, 2013 to September 3, 2013**

*Centre of Work*

**677,070E; 5,540,200N  
(NAD 83)**

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**BC Geological Survey  
Assessment Report  
34456**

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## SUMMARY

The 18 claim 7,726 hectare Porcupine 559067 claim group ("Property") is situated within the Intermontane belt of rocks traversing the extent of British Columbia which hosts some of the most historic and/or currently productive copper mines of North America such as at Copper Mountain, Craigmont, Afton/New Afton, and the Highland Valley/Lornex; all within 70 kilometres of the Property.

The Porcupine 559067 claim group is located within the historic Aspen Grove Camp in southern British Columbia where mineral exploration has been explored for since the early 1900's. The result was the discovery of an abundance of variable sized workings on mineral zones occurring predominantly as skarns, volcanogenic, polymetallic veins, and as porphyry mineralization within the Central Belt of the Nicola volcanics which hosts a greater abundance of mineral occurrences than the paucity of mineral occurrences within the Eastern Belt and the Western Belts.

The Porcupine 559067 claim group covers predominantly Nicola volcanics and dioritic intrusives of the Central Belt and hosts 11 Minfile mineral occurrences which include one past producer (Copper Star), one developed prospect (Porcupine), three showings, and five prospects. The majority of the 11 are clustered in a northerly band associated with and generally confined between the major structures of the Kentucky-Alleyne fault system which, where shown, are largely two kilometres apart.

The mineral occurrences diminish rapidly from the eastern and the western structures which suggests that the structures are at the crest of an anticline. The crest of the anticline with the resulting crestral structures would be the opportune location for the development of the major Kentucky-Alleyne structures. Thus the proliferation of mineral occurrences associated with the anticlinal crest and the major structures could be attributed increased fracture density which may have been the plumbing system for the mineralized hydrothermal fluids to reach the surface or in broader terms "surface seepage".

The two claims subject to the structural analysis are located within the Central Belt where a greater degree of mineral occurrences would be expected; however, the claims are on the eastern limb (?) of the anticline where structures resulting from the anticlinal development would be moderate to minimal. The CONE mineral showing (*Minfile 092HNE146*), the easternmost nearest the Eastern Belt, shows only minor mineralization possibly due to the low degree of fractures and is the lone Minfile mineral occurrence on the two claims.

A zone of increased fracture density to accommodate mineralizing fluids could also be developed at the location of major cross structures such as at the two cross structural locations of Tenures 559067 & 559068. The degree of mineralization and thus the mineral resource potential is often dependent on the degree of fracture intensity as at the Brenda past producer (*Minfile 092HNE047*), where the grade of the orebody is a function of fracture (vein) density and of the thickness and mineralogy of the filling material. Mineralization decreases outwardly from the most intensely fractured/mineralized rock and the centre of the main mineral zone.

Thus, the two structural locations as designated on Figures 6 & 8 are prospective areas to search for geological indicators of a potential economic mineral resource. These geological indicators may be revealed as minerals and/or alteration products and would be subject to interpretation as economic mineral indicators.

## INTRODUCTION

From August 1, 2013 to September 3, 2013 a structural analysis was completed on Tenures 559067 & 559068 of the 18 claim Porcupine 559067 claim group ("Property"). The purpose of the program was to delineate structures which may be integral in geological controls to potentially economic mineral zones that may occur on Tenures 559067 & 559068 or other claims of the Property.

Information for this report was obtained from sources as cited under Selected References and from mineral exploration work the writer has done in the Aspen Grove Camp since the 1980's.

## PROPERTY DESCRIPTION AND LOCATION

The Property is located within BCGS Maps 092H.097/.098 and 092I.007/.008 of the Nicola Mining Division, 204 direct kilometres from Vancouver and 26 direct kilometres from Merritt.

Figure 1. Location Map



**Property Description and Location (cont'd)**

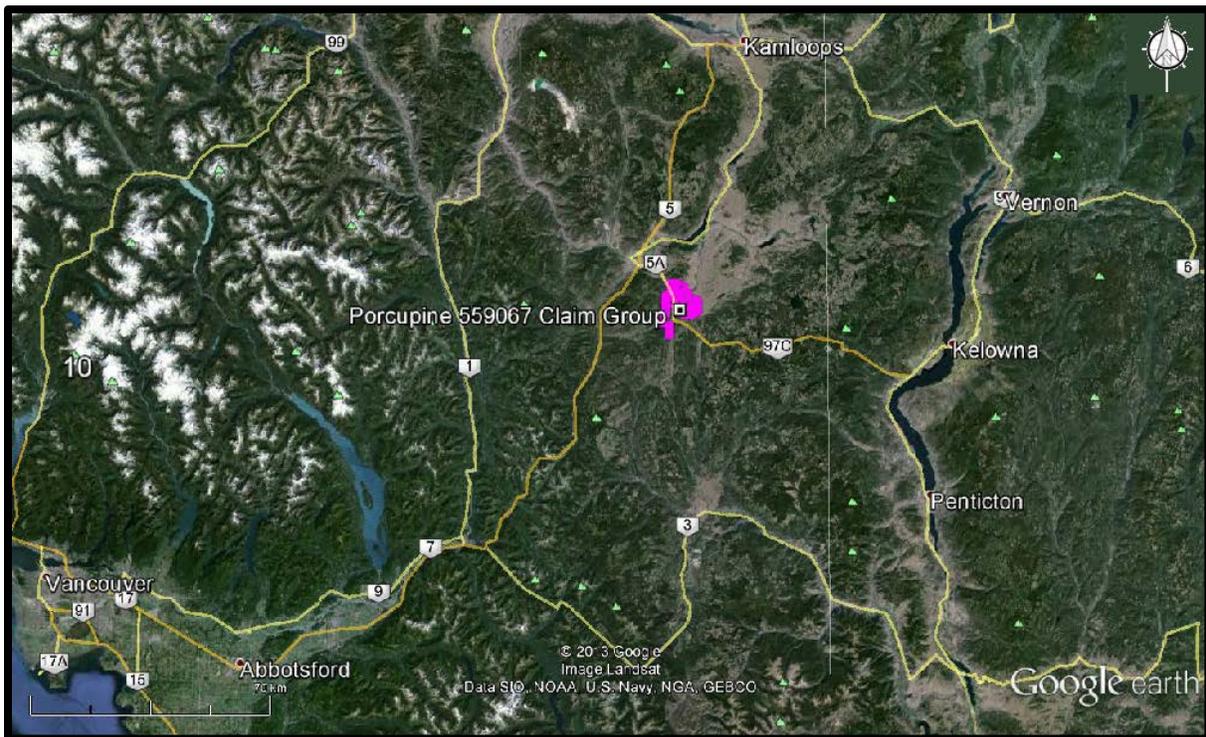
The Property is comprised of 18 claims covering an area of 7726.6712 hectares. Particulars are as follows:

**Table I. Tenures of the Porcupine 55907 Claim Group**

<u>Tenure Number</u>	<u>Type</u>	<u>Claim Name</u>	<u>Good Until</u>	<u>Area (ha)</u>
<a href="#">504332</a>	Mineral		20131127	186.775
<a href="#">504333</a>	Mineral		20131127	623.12
<a href="#">504335</a>	Mineral		20131127	457.158
<a href="#">504336</a>	Mineral		20131127	581.861
<a href="#">504337</a>	Mineral		20131127	623.111
<a href="#">524872</a>	Mineral	RED JAY A	20131127	519.016
<a href="#">524873</a>	Mineral	PORCUPINE 1	20131127	518.847
<a href="#">526115</a>	Mineral	RED JAY WEST	20131127	519.249
<a href="#">530397</a>	Mineral	DOR 2	20131127	186.864
<a href="#">530401</a>	Mineral		20131127	124.577
<a href="#">530402</a>	Mineral		20131127	311.4
<a href="#">530407</a>	Mineral	ROBIN	20131127	62.289
<a href="#">558838</a>	Mineral	NEW PORCUPINE 2	20131127	539.5833
<a href="#">559067</a>	Mineral	NEW EAST 1	20131127	560.939
<a href="#">559068</a>	Mineral	NEW EAST 2	20131127	540.0912
<a href="#">917409</a>	Mineral	ASPEN GROVE WEST 1	20131127	498.469
<a href="#">917410</a>	Mineral	ASPEN GROVE WEST 2	20131127	498.9208
<a href="#">917429</a>	Mineral	ASPEN GROVE WEST 3	20131127	374.4009

\*Upon the approval of the assessment work filing, Event 5465947.

Figure 2. Claim Location  
(from MapPlace & Google Earth)



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

### Access

Access to the Property is southward from Merritt via Highway 5A/97C for 16 kilometres to the northern boundary of Tenure 558838 of the Property. Secondary roads provide access to most general areas of the Property.

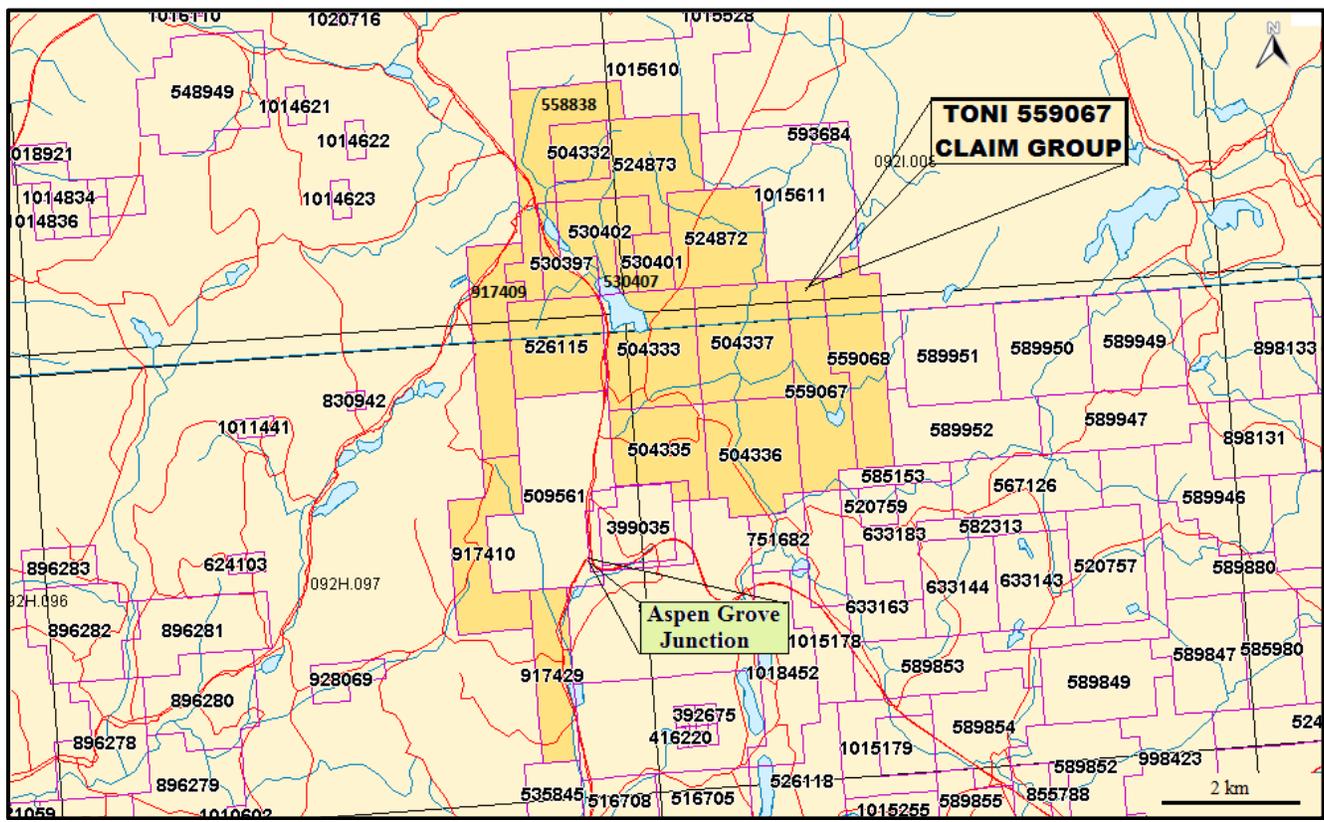
### Climate

The Property is situated within the dry belt of British Columbia with rainfall between 25 and 30 cm per year. Temperatures during the summer months could reach a high of 35°C and average 25°C with the winter temperatures reaching a low of -10°C and averaging 8°C. On the Property snow cover on the ground could be from December to April and would not hamper a year-round exploration program.

### Local Resources & Infrastructure

Merritt, and/or Kamloops, historic mining centres, could be a source of experienced and reliable exploration and mining personnel and a supply for most mining related equipment. Kamloops is serviced daily by commercial airline and is a hub for road and rail transportation. Vancouver, a port city on the southwest corner of, and the largest city in, the Province of British Columbia is four hours distant by road and less than one hour by air from Kamloops.

Figure 3. Claim Map from MapPlace



### **HISTORY: PROPERTY AREA**

The geology on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers on the Property and peripheral to the Property (Figure 4) are reported as follows. The distance from the Property is relative to adjoining Tenures 559067 & 559068 which is the subject of the structural analysis.

#### **HN-WEN prospect (Volcanic redbed Cu)**

MINFILE 092HNE058

Six kilometres southeast

*Adits and trenches were initially cut around 1900; later work included diamond drilling and trenching in the 1960s and 1970s.*

#### **BIG SIOUX past producer (Volcanic redbed Cu; Alkalic porphyry Cu-Au)**

MINFILE 092HNE073

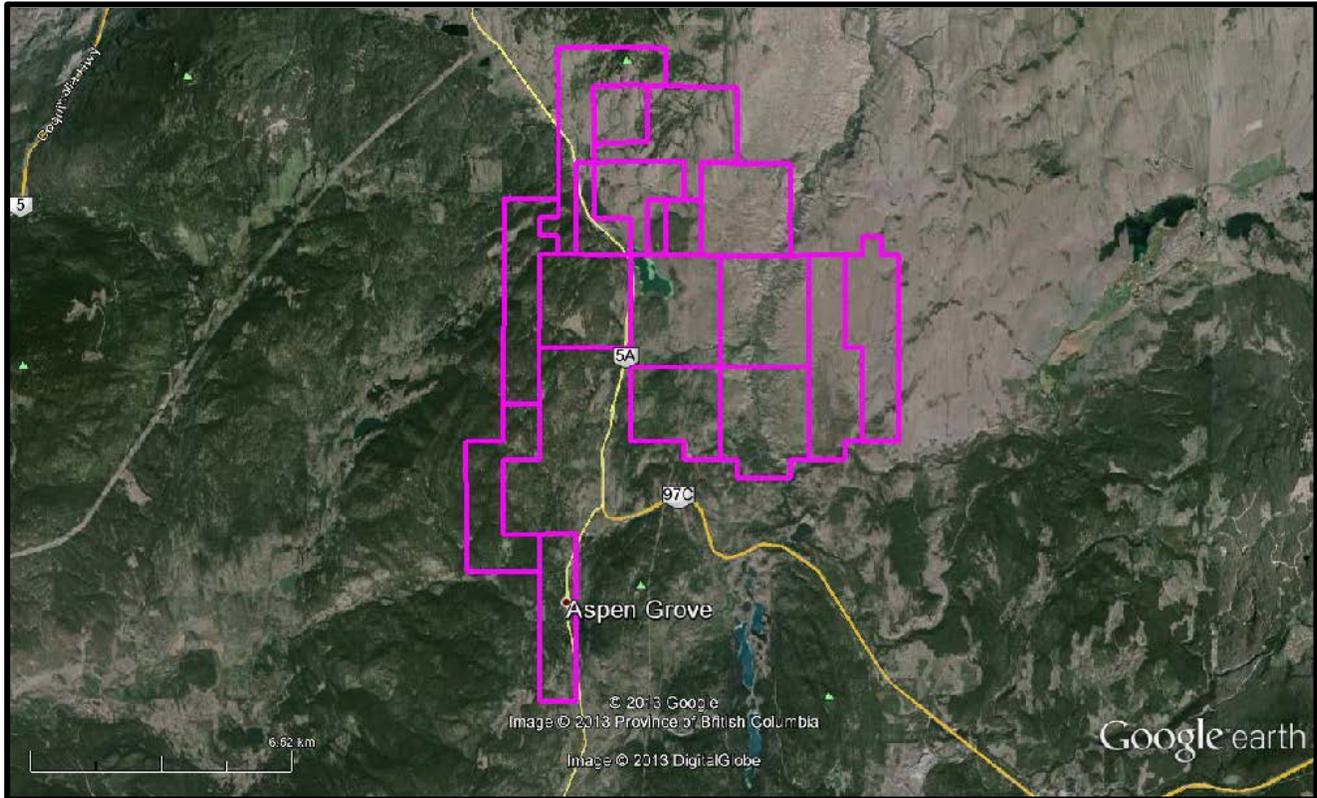
Four kilometres southwest

*This deposit was one of the first showings to be explored in the Aspen Grove copper camp. It was staked in 1899, and investigated periodically by H.H. Schmidt up to 1914. One shaft, 10 metres deep, an adit, 46 metres long, and numerous pits and trenches were excavated during this time. Forty-four tonnes of ore were shipped in 1918 grading 9.78 per cent copper and 67.9 grams per tonne silver. David Minerals Ltd., Amax Exploration Inc. and Norranco Mining and Refining completed soil and rock geochemical and geophysical surveys over the deposit between 1968 and 1978.*

**History: Property Area (cont'd)****Big Sioux past producer (cont'd)**

The occurrence was restaked in 1989 after copper mineralization was exposed in a roadcut along the north side of the recently completed Coquihalla Highway (Phase 3 - Okanagan Connector). The deposit was subsequently mapped and sampled by Amex Exploration Services Ltd. in 1990, Northair Mines Ltd. in 1991 and Placer Dome Inc. in 1992. Christopher James Gold Corp. drilled the area, including the Big Kidd (092HNE074) in 1997.

Figure 4. **Toni 559067 Claim Group & Topography**  
(Map from MapPlace & Google)

**History: Property Area (cont'd)**

**PAYCINCI** developed prospect (Volcanic redbed Cu)

MINFILE 092HNE084

Six kilometres west-southwest

The Cincinnatti deposit was first explored by the Bates brothers in the early 1900s. A number of trenches, and one adit 120 metres long, were excavated between 1899 and 1913. Payco Mines Ltd. and Alscope Consolidated Ltd. conducted geological and geophysical surveys, trenching and diamond and percussion drilling between 1963 and 1967. An additional 15 holes totalling 1000 metres were drilled by Gold River Mines and Enterprises Ltd. in 1973 and Sienna Developments Ltd. in 1979. The deposit was most recently sampled by Pacific Copperfields Ltd. in 1992.

In 1998, Christopher James Gold Corp. optioned the property. Reserves are estimated at 1.8 million tonnes grading 1 per cent copper (Tom Schroeter, 1998).

Rock chip samples assayed up to 0.67 per cent copper and 0.16 per cent molybdenum (Assessment Report 17277).

**History: Property Area (cont'd)**

**AU-WEN** prospect (Intrusion related Au pyrrhotite veins; Polymetallic veins Ag-Pb-Zn+/-Au)  
MINFILE 092HNE144  
Two kilometres south

*The occurrence lies in the northern assemblage of the Eastern belt of the Nicola Group (after Preto, Bulletin 69). This assemblage mainly consists of well-bedded submarine volcanoclastic rocks, ranging from tuffaceous volcanic siltstones characteristic of the lower part, to coarse volcanic conglomerate and laharic breccias in the upper part.*

*The assemblage is characterized by a paucity of intrusive rocks in comparison to the main Aspen Grove copper camp in the Central belt a few kilometres to the west, separated by the Kentucky-Alleyne fault system (Bulletin 69).*

*The AU occurrence is centred on the main gold showing, a small stripped, drilled and trenched area just off a gravel road south of Quilchena Creek (Assessment Reports 5766, 16008). This and most of the surrounding area is underlain by andesitic to dacitic tuff, cherty tuff, black argillite, and volcanic sandstone and siltstone. The rocks are strongly fractured in a variety of orientations. Bedding in the tuff has been measured to strike 060 degrees and dip 54 degrees northwest, but it varies.*

*About 1 kilometre to the north of the main showing is biotite hornblende granodiorite and quartz monzonite of the Early Jurassic Pennask batholith, and about 500 metres to the west are porphyritic andesitic and basaltic volcanic rocks (Bulletin 69; Assessment Report 16008). Small bodies of diorite and micromonzonite, possibly subvolcanic, are quite common in the area, on the surface and in drill core (Assessment Report 16008). Some of the volcanics have sustained carbonate and epidote alteration, and locally they have pervasive hematite (Assessment Report 16008).*

**HISTORY: PROPERTY**

**COPPER STAR** past producer (Volcanic redbed Cu)  
MINFILE 092HNE036  
Tenure 504333 of Property

*A small amount of production from the old workings is reported in 1915, when 41 tonnes of hand-sorted ore were shipped to a smelter. According to the returns, this shipment graded 8.7 per cent copper and 75.4 grams per tonne silver (Minister of Mines Annual Report 1915, Ag 227). Tanjo Mines Ltd. completed geological, geophysical and soil geochemical surveys over the showings between 1970 and 1972. Similar surveys were conducted by Redding Gold Corporation in 1988.*

**TAB** prospect (Volcanic redbed; Alkalic porphyry Cu-Au)  
MINFILE 092HNE052  
Tenure 504335 of Property

*The Tab occurrence covers a small group of showings of copper mineralization in part of the historical Aspen Grove copper camp, between Merritt and Princeton, where exploration dates back to the turn of the twentieth century. It is centred on a zone of mineralization called Zone 1 in Assessment Report 9386. This is located 1 kilometre east of Highway 5, about 4 kilometres north of the community of Aspen Grove, 700 metres northwest of the northern end of Tule Lake. The Blue Jay prospect (092HNE105) is about 500 metres to the north.*

**History: Property (cont'd)****PORCUPINE** developed prospect (Volcanic redbed Cu)

MINFILE 092ISE054

Tenure 504332 of Property

**1966:** Amalgamated Resources Ltd. completed an Induced Potential and Resistivity Survey (AR 962) over ground covered by the Porcupine shaft.

**1968:** Amalgamated Resources Ltd. completed a geochemical survey (AR 1,595) over ground covered by the Porcupine shaft.

**1978:** Burdos Mines Ltd. completed a VLF-EM survey (AR 7,043) over an area which covered the Porcupine shaft. The results indicated that the Porcupine shaft is located 50 metres west of the northern end of a 450 metre long 020 trending anomaly; the strongest anomaly of the survey.

**1979:** Pentagon Resources Ltd. completed 5 diamond drill holes totalling 444.4 metres (AR 7,876).

**1999:** Corbett Lake Minerals, Inc. completed prospecting and soil sampling (AR 26,232) over a localized area approximately 500 metres south of the Porcupine shaft

**2009:** Etna Resources Ltd. completed geological, geophysical, and geochemical surveys (AR 31,213) on the Aspen Grove property which included ground covered by the Porcupine 559067 Claim Group, the subject of this report. Specific to the exploration completed was a localized area which included the Porcupine mineral showing which was held almost continuously by individuals and/or companies, and has been a focus of exploration since the early 1900's.

**JUNE** prospect (Cu skarn; Volcanic redbed Cu; Fe skarn; Alkalic porphyry Cu-Au)

MINFILE 092HNE061

Tenure 504336 of Property

*The June occurrence consists of minor copper mineralization in part of the historical Aspen Grove copper camp, between Merritt and Princeton, where exploration dates back to the turn of the twentieth century. It is centred 400 metres west of Quilchena Creek, 3.2 kilometres east of Highway 5A, 6 kilometres northeast of the community of Aspen Grove. The June claims appear to overlap with the Ski claims, which contain mineralization covered by the Court 1 (092HNE147) and Snowflake 7 (092HNE203) occurrences.*

**SNOWFLAKE 6** showing (Volcanic redbed Cu)

MINFILE 092HNE145

Tenure 504333 of Property

*The Snowflake 6 occurrence is a small area of minor copper mineralization in part of the historical Aspen Grove copper camp between Merritt and Princeton, where exploration dates back to the turn of the twentieth century. It is centred on a small cluster of old workings 1 kilometre south of Courtney Lake, 500 metres east of Highway 5A, 6 kilometres north of the community of Aspen Grove (Assessment Report 3555).*

**TINMILSH LAKE** showing (Volcanic redbed Cu)

MINFILE 092HNE168

Tenure 504335 of Property

*The Tinmilsh Lake showing is 700 metres northeast of the north end of Tinmilsh Lake, 300 metres west of Highway 5 and 5.0 kilometres north of Aspen Grove.*

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**History: Property** (cont'd)**CONE** showing (Volcanic redbed Cu)

MINFILE 092HNE146

Tenure 559068 of Property

*The Cone occurrence is a minor copper showing in part of the historical Aspen Grove copper camp, between Merritt and Princeton, where exploration dates back to the turn of the twentieth century. It is located just northeast of the former Ski group of claims, 3 kilometres east of Quilchena Creek, 9.5 kilometres northeast of the community of Aspen Grove (Bulletin 69; Assessment Report 925).*

**COURT 1** showing (Volcanic redbed Cu)

MINFILE 092HNE147

Tenure 559067 of Property

*The Court 1 occurrence is a minor copper showing in part of the historical Aspen Grove copper camp, between Merritt and Princeton, where exploration dates back to the turn of the twentieth century. It is located on the former Ski group of claims (particularly Ski 13-16), on a tributary of Quilchena Creek, 3.5 kilometres east of Highway 5A, 7.5 kilometres northeast of the community of Aspen Grove (Assessment Report 925; Preliminary Map 15; Bulletin 69).*

**DOR** showing (Volcanic redbed Cu)

MINFILE 092HNE164

Tenure 524872 of Property

*The Dor showing is located 1.8 kilometres north east of Courtney Lake, approximately 18.3 kilometres south east of Merritt.*

*A number of historic trenches and adits, of unknown Ag, occur on the property. In the late 1980's Redding Gold Corp. explored the showing. In 2004, G. Diakow prospected the showing under the Fox claims of the Double Loon property.*

**SKI** prospect (Volcanic redbed Cu)

MINFILE 092HNE203

Tenure 504336 of Property

*The Ski prospect is exposed along the east bank of Quilchena Creek, 2.4 to 2.7 kilometres north-northwest of Pothole Lake and 6 kilometres northeast of the community of Aspen Grove.*

*This prospect was first explored by Chataway Exploration Co. Ltd. The company conducted geological mapping, soil sampling geophysical surveying, trenching and 302 metres of diamond drilling in two holes in 1966 and 1968. An additional three holes totalling 90 metres were drilled by Ballinderry Explorations Ltd. in 1973. The occurrence was prospected and magnetically surveyed by Newconex Canadian Exploration Ltd. in 1974. Laramide Resources Ltd. sampled and mapped the deposit in 1985.*

**GEOLOGY: REGIONAL**

The Aspen Grove geological district is located within the regional Quesnel Trough, a 30 to 60, km wide belt of Lower Mesozoic volcanic and related strata enclosed between older rocks and much invaded by batholiths and lesser intrusions (Campbell and Tipper, 1970). The southern part is the well-known Nicola belt, continuing nearly 200 km to its termination at the U.S. border and containing the important copper deposits of Highland Valley, Craigmont, Copper Mountain, Afton, in addition to the historic Hedley gold camp.

**Geology: Regional (cont'd)**

The Nicola Group has been divided into Western, Central, and Eastern belts on the basis of lithology, litho-geochemistry and by major fault systems. Variation from calc-alkaline to shoshonitic compositions from west to east has been interpreted to reflect eastward dipping subduction in the Nicola arc. According to the Minfile descriptions of Minfile occurrence on and adjacent to the Property,

**GEOLOGY: PROPERTY AREA**

The geology on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers on the Property and peripheral to the Property (Figure 4) are reported as follows. The distance from the Property is relative to adjoining Tenures 559067 & 559068 which is the subject of the structural analysis.

**HN-WEN** prospect (Volcanic redbed Cu)

MINFILE 092HNE058

Six kilometres southeast

*The HN-WEN occurrence is hosted in the Upper Triassic Nicola Group, which regionally consists of alkalic and calcalkalic volcanics and intrusions of island arc origin, and which is the principal component of the Quesnel Terrane in southern British Columbia (Geological Survey of Canada Maps 41-1989, 1713A). This belt has been of major economic interest because of its potential for porphyry copper-gold mineralization.*

*The occurrence lies in the northern assemblage of the Eastern belt of the Nicola Group (after Preto, Bulletin 69). This assemblage mainly consists of well-bedded submarine volcanoclastic rocks and volcanic flows. The main Aspen Grove copper camp lies several kilometres to the west in the Central belt, separated by the north-striking Kentucky-Alleyne fault system (Bulletin 69).*

*The area of the occurrence is underlain by augite porphyritic volcanic flows of andesitic to basaltic composition, fragmental rocks including tuff and breccia, and argillites (Assessment Reports 1586, 4230). The argillites are dark grey to black, well bedded, and locally limy. They are somewhat carbonaceous and pyritic. Minor rock types present include feldspar porphyry and locally lenses of diorite. About 2.5 kilometres to the northeast is the contact with the Early Jurassic Pennask batholith, a large intrusion of medium-grained granodiorite to quartz diorite.*

*The contact between the volcanic rocks and the argillites passes through the centre of the mineralized area. The contact is parallel to bedding, striking 130 degrees and dipping 40 degrees southwest, with the volcanic rocks on the northeast side (Assessment Report 4230).*

**BIG SIOUX** past producer (Volcanic redbed Cu; Alkalic porphyry Cu-Au)

MINFILE 092HNE073

Four kilometres southwest

*The Fairweather Hills region is underlain by the Central volcanic facies of the Upper Triassic Nicola Group, comprising intermediate, feldspar and feldspar augite porphyritic pyroclastics and flows, and associated alkaline intrusions. The intrusions vary from diorite to monzonite in composition and are thought to be comagmatic with the Nicola Group, ranging in age from Late Triassic to Early Jurassic.*

*Locally, the area is underlain by red and green laharic breccias, augite andesite porphyry and minor sediments of the Nicola Group (Central belt, Bulletin 69). The units generally strike north-northwest and dip east. This sequence is broken up into a series of tilted fault blocks trending north.*

**Geology: Property Area (cont'd)****PAYCINCI** developed prospect (Volcanic redbed Cu)  
MINFILE 092HNE084

Eight kilometres south

*The deposit is located in the southern portion of an area of hilly upland situated in the centre of the Aspen Grove copper camp, known as the Fairweather Hills. The Fairweather Hills region is underlain by the Central volcanic facies of the Upper Triassic Nicola Group, comprising intermediate, feldspar and feldspar augite porphyritic pyroclastics and flows, and associated alkaline intrusions.*

*The intrusions vary from diorite to monzonite in composition and are thought to be comagmatic with the Nicola Group, ranging in age from Late Triassic to Early Jurassic.*

*Locally, the area is underlain by red and green laharic breccias, augite andesite porphyry and minor sediments of the Nicola Group (Central belt, Bulletin 69). The units generally strike north-northwest and dip east. This sequence is broken up into a series of tilted fault blocks trending north.*

**MINT** showing (Porphyry Cu +/- Mo +/- Au)

MINFILE 092ISE084

Three kilometres north

*The property lies in the central belt of the Upper Triassic Nicola Group. Porphyritic quartz monzonite is the major rock type exposed on the east side of Quilchena Creek. A biotite-rich unit outcrops to the north. The intrusive is called the Quilchena pluton and is a subsidiary stock of the Lower Jurassic Pennask batholith which intrudes the Nicola Group volcanics. The Quilchena Creek fault is a major north-northeast trending fault system which approximately parallels Quilchena Creek. To the west, the monzonitic pluton is overlain by Eocene sandstone and conglomerate which are believed to be the basal member of the Coldwater Formation (Princeton Group). Farther to the west, these sediments are overlain by Pleistocene valley basalts.*

*The Quilchena pluton exhibits alteration and mineralization characteristics of porphyry copper environments. Three overlapping hydrothermal alteration zones comprise an area with a 1500 metre radius. A central 800 metre wide zone of intense potassic and kaolinitic alteration is characterized by close-spaced microveinlet- fillings of quartz and potassium feldspar.*

**AU-WEN** prospect (Intrusion related Au pyrrhotite veins; Polymetallic veins Ag-Pb-Zn+/-Au)

MINFILE 092HNE144

Two kilometres south

*The occurrence lies in the northern assemblage of the Eastern belt of the Nicola Group (after Preto, Bulletin 69). This assemblage mainly consists of well-bedded submarine volcanoclastic rocks, ranging from tuffaceous volcanic siltstones characteristic of the lower part, to coarse volcanic conglomerate and laharic breccias in the upper part.*

*The assemblage is characterized by a paucity of intrusive rocks in comparison to the main Aspen Grove copper camp in the Central belt a few kilometres to the west, separated by the Kentucky-Alleyne fault system (Bulletin 69).*

*The AU occurrence is centred on the main gold showing, a small stripped, drilled and trenched area just off a gravel road south of Quilchena Creek (Assessment Reports 5766, 16008). This and most of the surrounding area is underlain by andesitic to dacitic tuff, cherty tuff, black argillite, and volcanic sandstone and siltstone.*

**Geology: Property Area (cont'd)****Au-Wen prospect (cont'd)**

*The rocks are strongly fractured in a variety of orientations. Bedding in the tuff has been measured to strike 060 degrees and dip 54 degrees northwest, but it varies.*

*About 1 kilometre to the north of the main showing is biotite hornblende granodiorite and quartz monzonite of the Early Jurassic Pennask batholith, and about 500 metres to the west are porphyritic andesitic and basaltic volcanic rocks (Bulletin 69; Assessment Report 16008). Small bodies of diorite and micromonzonite, possibly subvolcanic, are quite common in the area, on the surface and in drill core (Assessment Report 16008). Some of the volcanics have sustained carbonate and epidote alteration, and locally they have pervasive hematite (Assessment Report 16008).*

**GEOLOGY: PROPERTY**

As indicated by the BC government supported MapPlace geological maps the Porcupine 559067 Claim Group is underlain predominantly by the Central Facies of the upper Triassic Nicola Group of basaltic volcanic rocks (uTrNC). Major regional north-northeasterly trending structures of the Kentucky-Alleyne fault system are covered by portions of the Property. In the north discontinuous faults are in a fault contact between the Nicola volcanics and a dioritic intrusive stock (Tenure 504335) and/or a fault contact between a southeasterly trending band of Pleistocene to Holocene volcanic rocks (Qvk) and a dioritic stock (LTrJdr).

The Property is situated within the central belt of the Nicola Group with the regional Kentucky-Alleyne fault system trending northerly through the western portion of the Property and the apparent divisional line between the Central and the Eastern Belts proximal to the southeastern corner of the Property. This line would be between the CONE showing (Minfile 092HNE146) in the Central Belt and the POT showing (Minfile 092HNE 204) in the Eastern Belt. The KIT showing (Minfile 092HNE270) granodiorite stock is indicated at the divisional line (see Figure 5). This line was probably based on lithological characteristics of the Nicola volcanics as there is an absence of any structure.

**COPPER STAR** past producer (Volcanic redbed Cu)

MINFILE 092HNE036

Tenure 504333 of Property

*The Copper Star occurrence is one of many in the Aspen Grove area. It lies in the Central belt or facies of the Nicola Group (after Preto, Bulletin 69). This belt mainly consists of subaerial and submarine, red or purple to green augite plagioclase porphyritic andesitic and basaltic flows, volcanic breccia and tuff, and minor argillite and limestone. The volcanics are locally intruded by bodies of comagmatic diorite to monzonite of Late Triassic to Early Jurassic Porcupine.*

*The region is characterized by long-lived, primarily north-striking faults and related fracturing, which originally controlled intrusion emplacement. Two important fault systems in the Aspen Grove area, the Kentucky-Alleyne fault and a splay of the Allison fault converge in the Copper Star area, just south of Courtney Lake. Numerous shear zones which host mineralization, described below, are probably related to these structures.*

*The Copper Star group of showings is hosted in red and green, augite and/or plagioclase porphyritic flows, breccias and tuffs of andesitic or basaltic composition (Assessment Report 17554). The volcanics contain magnetite. The strata strike northwest and dip southwest.*

**Geology: Property (cont'd)****Copper Star** past producer (cont'd)

*Epidote alteration of the volcanics is pervasive, and is commonly accompanied by disseminated jasper or hematite. Alteration is greater in shear fractures, which may also contain quartz and calcite veins as well as jasper and hematite. Epidote alteration, grain size in the volcanics, and copper mineralization all tend to increase from east to west (Assessment Report 17554).*

**TAB** prospect (Volcanic redbed; Alkalic porphyry Cu-Au)

MINFILE 092HNE052

Tenure 504335 of Property

*The occurrence is hosted in the Upper Triassic Nicola Group, which regionally consists of alkalic and calcalkalic volcanics and intrusions of island arc origin, and which is the principal component of the Quesnel Terrane in southern British Columbia (Geological Survey of Canada Maps 41-1989, 1713A). This belt has been of major economic interest because of its potential for porphyry copper-gold mineralization.*

*The Tab occurrence is one of many in the Aspen Grove area. It lies in the Central belt or facies of the Nicola Group (after Preto, Bulletin 69). These rocks mainly consist of subaerial and submarine, red or purple to green augite plagioclase porphyritic andesitic and basaltic flows, volcanic breccia and tuff, and minor argillite and limestone. Locally the strata strike north to northwest and dip southwest. The volcanics are intruded by a north-trending body of comagmatic diorite to monzonite, about 500 metres wide, of Late Triassic to Early Jurassic age. The area is characterized by long-lived, primarily north-striking faults and related fracturing, which originally controlled intrusion emplacement. East-striking faults are subordinate, and commonly offset intrusive contacts.*

*The area around the Tab occurrence is underlain by fine-grained porphyritic basaltic and andesitic volcanics and equivalent volcanoclastics, and minor sedimentary rocks, and a composite body of fine, medium and coarse-grained diorite and porphyritic monzonite. Hybrid or gradational volcanic-intrusive characteristics in some rocks in the contact area support a comagmatic origin.*

**PORCUPINE** developed prospect (Volcanic redbed Cu)

MINFILE 092ISE054

Tenure 504332 of Property

*The Porcupine occurrence is located in a northeast trending, fault-bound belt of Lower Cretaceous intermediate to felsic continental volcanic rocks with associated sedimentary and intrusive rocks which correlate with the Kingsvale Group. Locally, stratigraphic contacts strike 030 degrees and dip 35 degrees to the southeast and unconformably overlie Upper Triassic Nicola Group volcanics. In the vicinity are reddish brown to maroon coloured andesitic to basaltic flows which are rich in plagioclase and, to a lesser extent, augite and zeolite (laumontite).*

**JUNE** prospect (Cu skarn; Volcanic redbed Cu; Fe skarn; Alkalic porphyry Cu-Au)

MINFILE 092HNE061

Tenure 504336 of Property

*The June occurrence is hosted in the Upper Triassic Nicola Group, which regionally consists of alkalic and calcalkalic volcanics and intrusions of island arc origin, and which is the principal component of the Quesnel Terrane in southern British Columbia (Geological Survey of Canada Maps 41-1989, 1713A). This belt has been of major economic interest because of its potential for porphyry copper-gold mineralization.*

**Geology: Property (cont'd)****June prospect (cont'd)**

*The occurrence is one of many in the Aspen Grove area. It lies in the Central belt or facies of the Nicola Group (after Preto, Bulletin 69). This belt of rocks mainly consists of subaerial and submarine, red or purple to green augite plagioclase porphyritic andesitic and basaltic flows, volcanic breccia and tuff, and minor argillites and limestone. The volcanics are intruded by bodies of comagmatic diorite to monzonite of Late Triassic to Early Jurassic Porcupine. The area is characterized by long-lived, primarily north-striking faults and related fracturing, which originally controlled intrusion emplacement. East-striking faults are subordinate, and commonly offset intrusive contacts.*

*Outcrop exposure of the Nicola Group is sparse in the area around the June occurrence, being mostly visible in trenches. Bedrock consists of green basaltic to andesitic volcanic flows and tuff (Minister of Mines Annual Report 1966; Geology, Exploration and Mining in B.C. 1973).*

*Propylitic alteration is widespread, with chlorite and local patches of epidote skarn alteration containing secondary clinopyroxene (probably diopside) and garnet (Geology, Exploration and Mining in B.C. 1970, 1973). Potassium feldspar alteration, and limonite or ankerite due to oxidation are also present.*

*Two prominent fracture sets are evident. One set of fractures and shears strikes east and dips steeply north, and a second set of fractures strikes north and dips steeply east. Numerous quartz veins and veinlets strike west.*

**SNOWFLAKE 6 showing (Volcanic redbed Cu)**

MINFILE 092HNE145

Tenure 504333 of Property

*The occurrence is hosted in red and green, augite and/or plagioclase porphyritic flows, breccias, tuffs and laharic deposits of andesitic to basaltic composition (Bulletin 69; Assessment Report 3555). The strata strike northwest and dip southwest. Alteration is generally present, mainly represented by epidote, particularly in fractures, shears and veins. Epidote may be accompanied by calcite, quartz and chlorite.*

*The occurrence is hosted in the Upper Triassic Nicola Group, which regionally consists of alkalic and calcalkalic volcanics and intrusions of island arc origin and which is the principal component of the Quesnel Terrane in southern British Columbia (Geological Survey of Canada Maps 41-1989, 1713A). This belt has been of major economic interest because of its potential for porphyry copper-gold mineralization.*

*The Snowflake 6 occurrence is one of many in the Aspen Grove area. It lies in the Central belt or facies of the Nicola Group (after Preto, Bulletin 69). This belt mainly consists of subaerial and submarine, red or purple to green augite plagioclase porphyritic andesitic and basaltic flows, volcanic breccia and tuff, and minor argillite and limestone. The volcanics are locally intruded by bodies of comagmatic diorite to monzonite of Late Triassic to Early Jurassic Porcupine.*

*The region is characterized by long-lived, primarily north-striking faults and related fracturing, which originally controlled intrusion emplacement. Two important fault systems in the Aspen Grove area, the Kentucky-Alleyne fault and a splay of the Allison fault, converge just south of Courtney Lake, in the vicinity of the Snowflake 6 occurrence.*

**Geology: Property (cont'd)****CONE** showing (Volcanic redbed Cu)

MINFILE 092HNE146

Tenure 559068 of Property

*The Cone occurrence is located in the Upper Triassic Nicola Group, which regionally consists of alkalic and calcalkalic volcanics and intrusions of island arc origin, and which is the principal component of the Quesnel Terrane in southern British Columbia (Geological Survey of Canada Maps 41-1989, 1713A). This belt has been of major economic interest because of its potential for porphyry copper-gold mineralization.*

*The occurrence is one of many in the Aspen Grove area. It lies in the Central belt or facies of the Nicola Group (after Preto, Bulletin 69). This belt of rocks mainly consists of subaerial and submarine, red or purple to green augite plagioclase porphyritic andesitic and basaltic flows, volcanic breccia and tuff, and minor argillites and limestone. The volcanics are intruded by bodies of comagmatic diorite to monzonite of Late Triassic to Early Jurassic Porcupine. The area is characterized by long-lived, primarily north-striking faults and related fracturing, which originally controlled intrusion emplacement. East-striking faults are subordinate, and commonly offset intrusive contacts.*

**COURT 1** showing (Volcanic redbed Cu)

MINFILE 092HNE147

Tenure 559067 of Property

*The Court 1 occurrence is located in the Upper Triassic Nicola Group, which regionally consists of alkalic and calcalkalic volcanics and intrusions of island arc origin, and which is the principal component of the Quesnel Terrane in southern British Columbia (Geological Survey of Canada Maps 41-1989, 1713A). This belt has been of major economic interest because of its potential for porphyry copper-gold mineralization.*

*The occurrence is one of many in the Aspen Grove area. It lies in the Central belt or facies of the Nicola Group (after Preto, Bulletin 69). This belt of rocks mainly consists of subaerial and submarine, red or purple to green augite plagioclase porphyritic andesitic and basaltic flows, volcanic breccia and tuff, and minor argillites and limestone.*

*The volcanics are intruded by bodies of comagmatic diorite to monzonite of Late Triassic to Early Jurassic Porcupine. The area is characterized by long-lived, primarily north-striking faults and related fracturing, which originally controlled intrusion emplacement. East-striking faults are subordinate, and commonly offset intrusive contacts.*

*The Court 1 occurrence is centred on an outcrop of andesitic to basaltic volcanic rocks in a creek draining into Quilchena Creek (Bulletin 69). This coincides with a copper soil anomaly (Assessment Report 925). These rocks are intruded by aplite dikes (Assessment Report 925). A short distance away there is an outcrop of skarn alteration (Assessment Report 925).*

**TINMILSH LAKE** showing (Volcanic redbed Cu)

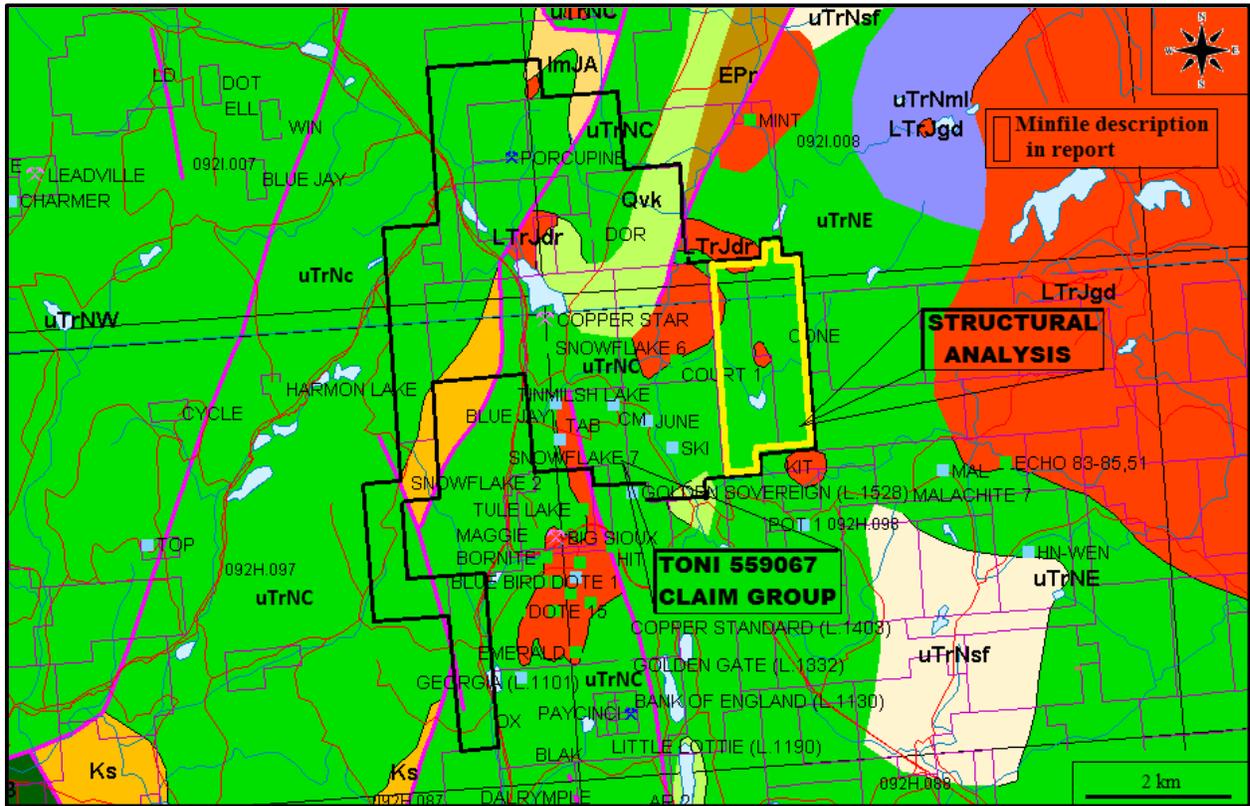
MINFILE 092HNE168

Tenure 504335 of Property

*Native copper occurs in red volcanic and laharc breccia of the Upper Triassic Nicola Group (Central belt, Bulletin 69). The showing lies immediately east of the faulted contact with a small body of Triassic-Jurassic quartz diorite.*

Geology: Property (cont'd)

Figure 5. CLAIMS, INDEX, GEOLOGY, & MINFILE  
(Base Map from MapPlace)



**GEOLOGY MAP LEGEND**

**Pleistocene to Holocene**

Qvk

Unnamed alkalic volcanic rocks

**Upper Triassic: Nicola Group**

**Eastern Volcanic Facies**

uTrNE

basaltic volcanic rocks

uTtNsf

mudstone, siltstone, shale, fine clastic sedimentary rocks

uTrNMI

lower amphibolite/kyanite grade metamorphic rocks

uTrJum

unnamed ultramafic rocks

**Central Volcanic Facies**

uTrNc

andesitic volcanic rocks

**Late Triassic to Early Jurassic**

LTrJgd

unnamed granodiorite intrusive rocks

LTrJdr

dioritic to gabbroic intrusive rocks

**Geology: Property** (cont'd)**DOR** showing (Volcanic redbed Cu)

MINFILE 092HNE164

Tenure 524872 of Property

*The area is underlain by Upper Triassic pyroxene and plagioclase-rich andesitic and basaltic flows, breccia, conglomerate and lahar deposits, and comagmatic dioritic intrusions. These are part of the central belt of the Nicola Group which are locally overlain by Pleistocene vesicular olivine valley basalts. The property lies along the Summers Creek-Quilchena fault system which trends north-northeast and has been mapped for over 160 kilometres.*

*Copper mineralization on the Dor showing is hosted by red volcanic breccia, lahar deposits and brecciated augite porphyritic andesitic flows. Three shallow shafts less than 3 metres deep expose north trending shear or fracture zones carrying calcite and quartz stringers with chalcopyrite, chalcocite and malachite. The sulphides also occur on fracture surfaces and as fine disseminations in the brecciated andesite. Relatively heavy hematite and/or epidote alteration is associated with the mineralization.*

**SKI** prospect (Volcanic redbed Cu)

MINFILE 092HNE203

Tenure 504336 of Property

*The occurrence is located in the Upper Triassic Nicola Group, which regionally consists of alkalic and calcalkalic volcanics and intrusions of island arc origin, and which is the principal component of the Quesnel Terrane in southern British Columbia (Geological Survey of Canada Maps 41-1989, 1713A). This belt has been of major economic interest because of its potential for porphyry copper-gold mineralization.*

*The Ski occurrence is one of many in the Aspen Grove area. It lies in the Central belt or facies of the Nicola Group (after Preto, Bulletin 69). This belt of rocks mainly consists of subaerial and submarine, red or purple to green augite plagioclase porphyritic andesitic and basaltic flows, volcanic breccia and tuff, and minor argillites and limestone. The volcanics are intruded by bodies of comagmatic diorite to monzonite of Late Triassic to Early Jurassic age.*

*The area is characterized by long-lived, primarily north-striking faults and related fracturing, which originally controlled intrusion emplacement. East-striking faults are subordinate, and commonly offset intrusive contacts.*

**MINERALIZATION: PROPERTY AREA**

The geology on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers on the Property and peripheral to the Property (Figure 4) are reported as follows. The distance from the Property is relative to adjoining Tenures 559067 & 559068 which is the subject of the structural analysis.

**HN-WEN** prospect (Volcanic redbed Cu)

MINFILE 092HNE058

Six kilometres southeast

**Mineralization: Property Area** (cont'd)**HN-WEN** prospect (cont'd)

*The mineralization is restricted to the volcanics. It is exposed in 3 adits and at least 8 trenches, and is marked by alteration, mainly epidotization, silicification, carbonatization, moderate chloritization and local pyritization. Chalcopyrite is the only copper mineral: it is disseminated, or concentrated in quartz and calcite veins and veinlets between 0.3 and 30 centimetres thick, usually about 8 centimetres thick. Pyrite, pyrrhotite and rare specular hematite are also present in the veins. Locally oxidation has produced abundant malachite, azurite and limonite. The mineralized zone measures 760 by 90 metres and has a depth of about 75 metres. Diamond drilling indicates that it strikes 160 degrees and dips vertically or steeply east, so it is not parallel to the volcanic-sedimentary contact, indicating that the contact is not the controlling factor.*

*Rather, the veins hosting the mineralization are structurally controlled by numerous faults and fractures which consistently strike 160 degrees and dip 85 degrees east (Assessment Report 4230). Incidentally, the Echo occurrence (092HNE059) lies on this trend, 2 kilometres to the north-northwest, and the mineralization may also extend south-southeast of the HN-WEN occurrence (Assessment Report 4230).*

*Some significant copper and silver values have been obtained from the workings and diamond drill core. A 1.5-metre chip sample from Adit Number 1 was assayed at 4.39 per cent copper, 92.6 grams per tonne silver, and 0.7 gram per tonne gold (Assessment Report 4230).*

*A grab sample from here was assayed at 4.84 per cent copper, 46.6 grams per tonne silver and 0.7 gram per tonne gold (Assessment Report 4230). Both samples were from oxidized material and may not be representative of grade throughout the deposit (Assessment Report 4230). A drill core sample (hole HNS 72-1) assayed 1.12 per cent copper and 3.4 grams per tonne silver (Assessment Report 4230).*

*The average grade of the whole deposit has been estimated at 0.08 per cent copper, with a generally low gold and silver content (Assessment Report 4230).*

In a 1996 exploration by George Resources on the WEN, one of 16 diamond drill holes, W96-1, reportedly intersected a 6.55 metre quartz zone which returned assays of 16.578 gm/t Au, 0.75% Cu, and 12.901 gm/t Ag. (Verley, 1997) This intersection was designated as the Main vein and was located 55 metres south-southeast of Adit #1. The 2010 Victory Resources diamond drill program reportedly resulted in the intersection of 5.50 metres assaying 2.62% Cu (Victory news release dated August 26, 2010).

**BIG SIOUX** past producer (Volcanic redbed Cu; Alkalic porphyry Cu-Au)

MINFILE 092HNE073

Four kilometres southwest

*Copper mineralization is exposed along a 300-metre long roadcut and in various old workings north of the roadcut, in an area 500 metres long and 300 metres wide. Mineralization consists primarily of pyrite and chalcopyrite, as disseminations, blebs, fracture fillings, and in calcite and epidote veins. Pyrite also forms thin bands, comprising up to 25 per cent of the hostrock. Malachite occurs along fractures in many surface exposures.*

**Mineralization: Property Area** (cont'd)**Big Sioux** past producer (cont'd)

*Chalcocite forms fracture fillings in one prominent 1.8-metres wide shear zone, striking 075 degrees and dipping 75 degrees north. Minor bornite is also reported. One chip sample taken along the roadcut assayed 3.27 per cent copper, 14.45 grams per tonne gold and 34.1 grams per tonne silver over 10 metres (Assessment Report 20834, Ag 5).*

*Channel sampling along a trench analysed 0.223 per cent copper, 0.106 gram per tonne gold and 1.26 grams per tonne silver over 27 metres (Assessment Report 7100, Ag 11, trench 4). A composite grab sample from the dump of a shaft, excavated in the chalcocite-bearing shear zone, assayed 12.6 per cent copper, 0.7 gram per tonne gold and 82 grams per tonne silver (Minister of Mines Annual Report 1901, Ag 1181).*

**PAYCINCI** developed prospect (Volcanic redbed Cu)

MINFILE 092HNE084

Six kilometres west-southwest

*Hypogene and supergene copper mineralization occurs in green laharic breccia, near the contact with red laharic breccia to the east. This mineralization consists primarily of disseminated and fracture controlled chalcocite and native copper, accompanied by lesser malachite and azurite, and minor chalcopyrite, bornite, cuprite and pyrite. Drilling indicates chalcopyrite becomes more abundant at depth at the expense of chalcocite. This mineralization is exposed along the crest and east flank of a small northerly trending ridge, over a north-south distance of 400 metres.*

*Drill indicated reserves are 54,000 tonnes grading 0.876 per cent copper (Assessment Report 7654, Ag 1). Precious metal values are generally low. Six rock samples analysed 1.1 to 2.4 per cent copper, 0.005 to 0.010 gram per tonne gold and 1.3 to 5.7 grams per tonne silver (Assessment Report 14108, Figure 5, samples 2051 to 2056). One chip sample taken along a trench yielded 0.89 per cent copper over 49 metres (George Cross News Letter No. 90 (May 8), 1992).*

**MINT** showing (Porphyry Cu +/- Mo +/- Au)

MINFILE 092ISE084

Three kilometres north

*The Quilchena pluton exhibits alteration and mineralization characteristics of porphyry copper environments. Three overlapping hydrothermal alteration zones comprise an area with a 1500 metre radius. A central 800 metre wide zone of intense potassic and kaolinitic alteration is characterized by close-spaced microveinlet- fillings of quartz and potassium feldspar. Chalcopyrite and molybdenite occur as disseminations and are associated with fractures.*

*The potassic zone grades into sericitized and kaolinized zones which also host chalcopyrite but have less abundant veins.*

*Occasional epidote-filled veins are suggestive of an outer zone of propylitic alteration. Pyrite occurs throughout the intrusive unit as disseminations and fracture-fillings and it is usually weathered to limonite. Malachite and azurite are on fracture planes surrounding the veins.*

*Rock chip samples assayed up to 0.67 per cent copper and 0.16 per cent molybdenum (Assessment Report 17277).*

**Mineralization: Property Area** (cont'd)

**AU-WEN** prospect (Intrusion related Au pyrrhotite veins; Polymetallic veins Ag-Pb-Zn+/-Au)  
MINFILE 092HNE144

Two kilometres south

*Pyrite, pyrrhotite, chalcopyrite and arsenopyrite are disseminated sporadically in the tuffaceous rocks and argillite, up to about 1 per cent, and also occur in fractures (Assessment Reports 11241, 16008). Native gold is associated with the sulphides in narrow quartz-filled fractures in these rocks (Assessment Report 16008). Minor malachite occurs in volcanics. The overall extent of the mineralization has not been determined, although diamond drilling has demonstrated that minor pyrite, pyrrhotite and chalcopyrite, disseminated or associated with quartz or calcite fracture veinlets, does persist below the surface (Assessment Reports 11241, 16008).*

*Gold values in the area are generally low, but high values have been obtained from trench sampling and drill core at the main showing. Significant gold assays in chip samples range from 6.8 grams per tonne over 5.1 metres to 10.8 grams per tonne over 4.9 metres (Assessment Report 16008).*

*Copper is associated with the gold mineralization; one rock sample from the main trench yielded 0.29 per cent copper (Assessment Report 7293). Another sample yielded 26 grams per tonne silver and 0.14 per cent lead (Assessment Report 7293). Silver in diamond drill core is generally under 1 gram per tonne (Assessment Report 11241).*

*Grab and select samples assayed between 14.4 and 91 grams per tonne gold (Assessment Reports 5766, 16008). The best drill core intersection assayed 4.97 grams per tonne gold over 1.5 metres (Assessment Report 16008).*

**MINERALIZATION: PROPERTY**

**COPPER STAR** past producer (Volcanic redbed Cu)

MINFILE 092HNE036

Tenure 504333 of Property

*Mineralization is most commonly hosted in the shear zones or in brecciated fracture zones. Here, alteration minerals are accompanied by malachite and pyrite, and smaller amounts of chalcopyrite, bornite, chalcocite, and locally minor native copper (Annual Report 1915; Assessment Report 17554; Geological Survey of Canada Memoir 243). Outside the shear zones, there are local concentrations of disseminated chalcopyrite and up to 10 per cent pyrite in volcanic tuff and breccia.*

*A number of old trenches, adits and opencuts exist in the area, and are most commonly located on the altered and mineralized shear zones or fractures in augite porphyry volcanics. The various old workings are scattered about an area, 200 metres wide, trending northeast for 290 metres.*

*Copper values from these areas are generally not high; however, one sample was analysed at 0.29 per cent copper, and another grab sample assayed 0.7 per cent copper (Assessment Reports 4779, 17554). Silver values are also low, the maximum being 2 grams per tonne (Assessment Report 17554).*

*A small amount of production from the old workings is reported in 1915, when 41 tonnes of hand-sorted ore were shipped to a smelter. According to the returns, this shipment graded 8.7 per cent copper and 75.4 grams per tonne silver (Minister of Mines Annual Report 1915, Ag 227). Tanjo Mines Ltd. completed geological, geophysical and soil geochemical surveys over the showings between 1970 and 1972. Similar surveys were conducted by Redding Gold Corporation in 1988.*

**Mineralization: Property Area** (cont'd)**TAB** prospect (Volcanic redbed; Alkalic porphyry Cu-Au)

MINFILE 092HNE052

Tenure 504335 of Property

*Most rocks contain fracture-related and disseminated pyrite and magnetite. Patterns of induced polarization and ground magnetic response correlate well with the concentration of pyrite (Assessment Reports 7122, 6260). The best copper mineralization occurs in rocks with little or no pyrite, that is, on the flanks of the induced polarization conductors (Assessment Report 7122).*

*Hydrothermal alteration and mineralization is strongest in a zone measuring at least 1100 by 120 metres that straddles the volcanics to the west and the fine-grained margin of the dioritic intrusion to the east (Assessment Reports 6260, 7122). The Tab occurrence is near the southern end of this zone (the Blue Jay occurrence, 092HNE105, is near the northern end). This zone is also characterized by strong fracturing, brecciation in the diorite, and by above-average pyrite. The alteration is propylitic and carbonate, there being widespread epidote (especially along fractures), calcite, chlorite,*

**PORCUPINE** developed prospect (Volcanic redbed Cu)

MINFILE 092ISE054

Tenure 504332 of Property

*Mineralization consists of disseminations of chalcocite, native copper, cuprite, bornite, chalcopyrite, pyrite, magnetite and specular hematite in brecciated tops of subaerial flows. Minerals occur in amygdules and thin fractures. Minor malachite and azurite occur near the surface.*

*The main showing contains a 15 metre deep inclined shaft sunk on a mineralized amygdaloidal, dark grey basaltic flow which is overlain by red tuffs.*

*Drill indicated reserves are reported as 125,179 tonnes grading 2.0 per cent copper and inferred (possible) reserves as 453,550 tonnes grading 1.9 per cent copper (Northern Miner - 1967, 1969).*

Ostler (2009) reports (AR 31,213) that mineralization near the Porcupine main shaft comprises mostly bornite, malachite, and azurite deposited in a matrix of basaltic flow breccia in Late Cretaceous-Ag Kingsvale group volcanic rocks. The surface exposure of mineralization extends south-southwestward from the main shaft for 80 metres (262 feet). A composite chip sample on a 1.2 metre thickness of autobreccia on the northern wall of the inclined shaft contained: 1.93% copper, 8.0 ppm silver, and 4.4 ppb gold.

Another composite chip sample taken from a 1.0 m thickness of autobreccia from the southern wall of the shaft contained: 0.92% copper, 2.4 ppm silver, and 3.8 ppb gold. In a trench about 30 m south of the shaft, the thickness of mineralization in the autobreccia was less than 0.5m. The last trace of malachite was observed in a trench about 80m south of the shaft.

The main shaft is located about 3m south of a sub-vertical fault that trends about 126 (306) degrees in the workings area. The extensively trenched area near the shaft northeast of the fault hosts no mineralization. Three 1979 percussion drill holes located north of the fault within 25m of the main shaft also contained no significant copper mineralization.

**Mineralization: Property Area** (cont'd)**Porcupine developed prospect** (cont'd)

Bailey (2011) reports that copper grade intersected in drill holes (*Figure 12*) ranged from 1.66% to greater than 6.0% over a true thickness of about 3 metres. A second, overlying mineralized horizon is suggested by the intersection in DDH-7 of 1.70% copper over a true thickness of 1.2 metres. A log of lithologies intersected by DDH-7 indicates that other mineralized horizons may be present.

The fault that bounds mineralization at the Porcupine workings is an extensive structure that can be traced both by limonitic soils and outcrops on the ground and by the 2007 airborne electromagnetic survey results of the area.

It was concluded that mineralization at the Porcupine workings was the result of fluids that ascended the fault plane and deposited copper mineralization in a favourable horizon in the Kingsvale Group volcanics. Orthoclase and quartz deposited on fracture planes adjacent to mineralization at the Porcupine main shaft indicates that mineralizing fluids were scavenged Triassic-Ag porphyry copper mineralization at depth.

**JUNE** prospect (Cu skarn; Volcanic redbed Cu; Fe skarn; Alkalic porphyry Cu-Au)

MINFILE 092HNE061

Tenure 504336 of Property

*Trenching has outlined a zone of sulphide mineralization stretching 700 metres northeastward towards Quilchena Creek. In the more northerly exposures pyrite, pyrrhotite, chalcopyrite and malachite occur as sparse disseminations in the volcanics and as fracture fillings and coarse blebs in some quartz veinlets. Magnetite is widespread. To the southwest, epidote skarn zones host up to 0.5 per cent chalcopyrite, and shear zones in diorite contain up to 1 per cent malachite near zones of carbonate alteration. Farther southwest, pyrrhotite and pyrite, with traces of chalcopyrite and malachite, form massive segregations in cherty sediments and fine-grained tuffs.*

*A percussion hole drilled near the north end of the zone graded 0.07 per cent copper over 91 metres (Assessment Report 9386, Ag 16). A chip sample taken in the vicinity analysed 0.085 gram per tonne gold and 2.5 grams per tonne silver over 175 metres (Assessment Report 13714, Drawing No. 2, sample 695). Rock sampling over the rest of the zone yielded metal values of up to 0.0415 per cent copper, 0.105 gram per tonne gold and 1.9 grams per tonne silver (Assessment Reports 9386, 13714).*

**SNOWFLAKE 6** showing (Volcanic redbed Cu)

MINFILE 092HNE145

Tenure 504333 of Property

*Several small pits and at least one adit at the Snowflake 6 occurrence lie close to a minor, east-striking fault (Assessment Report 3555). The pits expose fractures mineralized with chalcopyrite, bornite, chalcocite, malachite and azurite, and locally minor native copper. Two rock samples analysed 0.6 to 0.7 gram per tonne silver and 0.005 to 0.015 gram per tonne gold (Assessment Report 13714, Drawing 2, samples 211, 212).*

**CONE** showing (Volcanic redbed Cu)

MINFILE 092HNE146

Tenure 559068 of Property

**Mineralization: Property Area (cont'd)****Cone showing (cont'd)**

*Little information is available on the Cone occurrence itself. It is centred on an outcrop of augite plagioclase porphyritic volcanic rocks of andesitic to basaltic composition (Bulletin 69; Preliminary Map 15). Mineralization at the showing consists of chalcopyrite, pyrite and malachite (Preliminary Map 15; Assessment Report 925). The nature of the mineralization is not specified but in other showings in the area minerals are characteristically disseminated or hosted in quartz veinlets.*

**COURT I** showing (Volcanic redbed Cu)

MINFILE 092HNE147

Tenure 559067 of Property

*Mineralization at the showing is exposed by stripping, and consists of chalcopyrite, pyrite, malachite and azurite. Chalcopyrite and molybdenite are present at the skarn-altered outcrop. The nature of the mineralization is not specified but in showings in the area minerals are characteristically disseminated or hosted in quartz veinlets.*

**DOR** showing (Volcanic redbed Cu)

MINFILE 092HNE164

Tenure 524872 of Property

*In 1989, rock samples from old adits and workings assayed up to 0.12 per cent copper (Prospectus, Redding Gold Corporation).*

*In 2004, sampling of the former second Dor adit returned up to 1.2 per cent copper and 4 grams per tonne silver. Two samples from the third Dor adit returned 0.434 per cent copper, 3 grams per tonne silver and 0.773 per cent copper (Assessment Report 27549).*

**TINMILSH LAKE** showing (Volcanic redbed Cu)

MINFILE 092HNE168

Tenure 504335 of Property

*Native copper occurs in red volcanic and laharc breccia of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

**SKI** prospect (Volcanic redbed Cu)

MINFILE 092HNE203

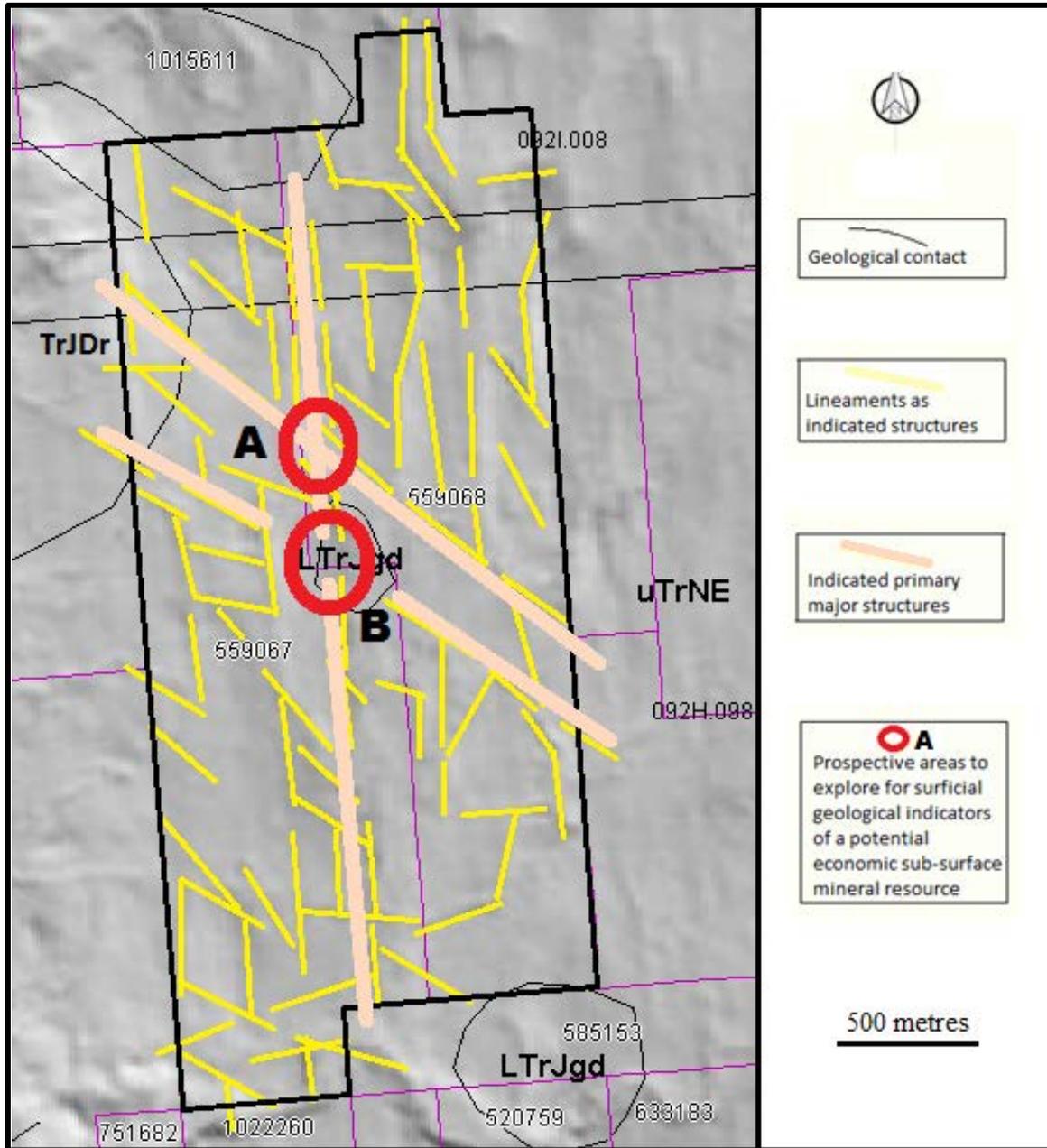
Tenure 504336 of Property

*Mineralization is hosted in hydrothermally altered latite/ andesite porphyry and adjacent weakly skarn altered, thinly bedded andesitic tuffs. The porphyry exhibits argillic, chlorite and sericitic alteration. The tuffs contain epidote, chlorite and minor orthoclase. All units are intensely faulted and fractured. The porphyry is traversed by closely-spaced fractures in several dominant sets, producing a sheeted appearance in outcrop. Narrow*

*Mineralization consists of chalcopyrite, pyrite and minor molybdenite, primarily in quartz veins and along fractures. Minor disseminated chalcopyrite occurs through the latite. Limonite, malachite and azurite accompany the sulphides in intensely weathered surface exposures. Hematite and magnetite are also reported. Trenching has exposed this copper mineralization over a north-south distance of at least 370 metres. Three rock samples from the trenches analysed 0.4 to 2.5 grams per tonne silver and 0.015 to 0.140 gram per tonne gold (Assessment Report 13714, Drawing No. 2, samples 923, 924 and 925).*

**Mineralization: Property Area (cont'd)**

**Figure 6. Indicated Lineaments (Structures) on Tenures 559067 & 559068**  
(Base Map from MapPlace)

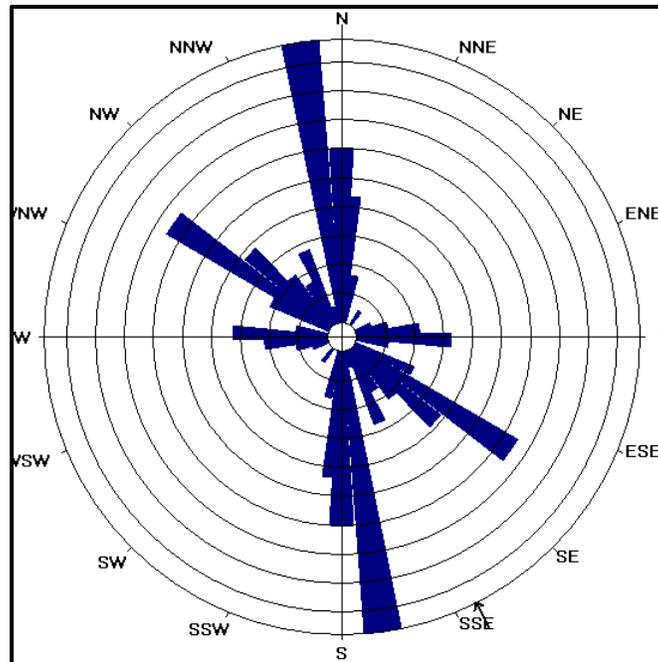


**Structural Analysis** (cont'd)

**STRUCTURAL ANALYSIS**

The structural analysis was performed on a MapPlace hillside shade map of Tenures 559067 & 559068 by viewing of the map and marking the lineaments, or indicated structures, thereon. A total of 92 lineaments were marked on Tenures 559067 & 559068, compiled into a 10 degree class interval, and plotted as a rose diagram as indicated on Figure 7.

*Figure 7. Rose Diagram from Lineaments of Tenures 559067 & 559068*



**STATISTICS**

(Tenures 559067 & 559068)

*Axial (non-polar) data*

No. of Data = 92

Sector angle = 8°

Scale: tick interval = 2% [1.8 data]

Maximum = 19.6% [18 data]

Mean Resultant dir'n = 153-333

[Approx. 95% Confidence interval = ±16.1°]

(valid only for unimodal data)

Mean Resultant dir'n = 153.2 - 333.2

Circ. Median = 001.0 - 181.0

Circ. Mean Dev. about median = 34.4°

Circ. Variance = 0.18

Circular Std.Dev. = 36.46°

Circ. Dispersion = 1.85

Circ. Std Error = 0.1419

Circ. Skewness = 3.29

Circ. Kurtosis = -15.26

kappa = 0.99

(von Mises concentration param. estimate)

Resultant length = 40.94

Mean Resultant length = 0.445

'Mean' Moments: Cbar = 0.2644; Sbar = -0.3579

'Full' trig. sums: SumCos = 24.3282; Sbar = -32.9286

Mean resultant of doubled angles = 0.2666

Mean direction of doubled angles = 179

(Usage references: Mardia & Jupp,

'Directional Statistics', 1999, Wiley;

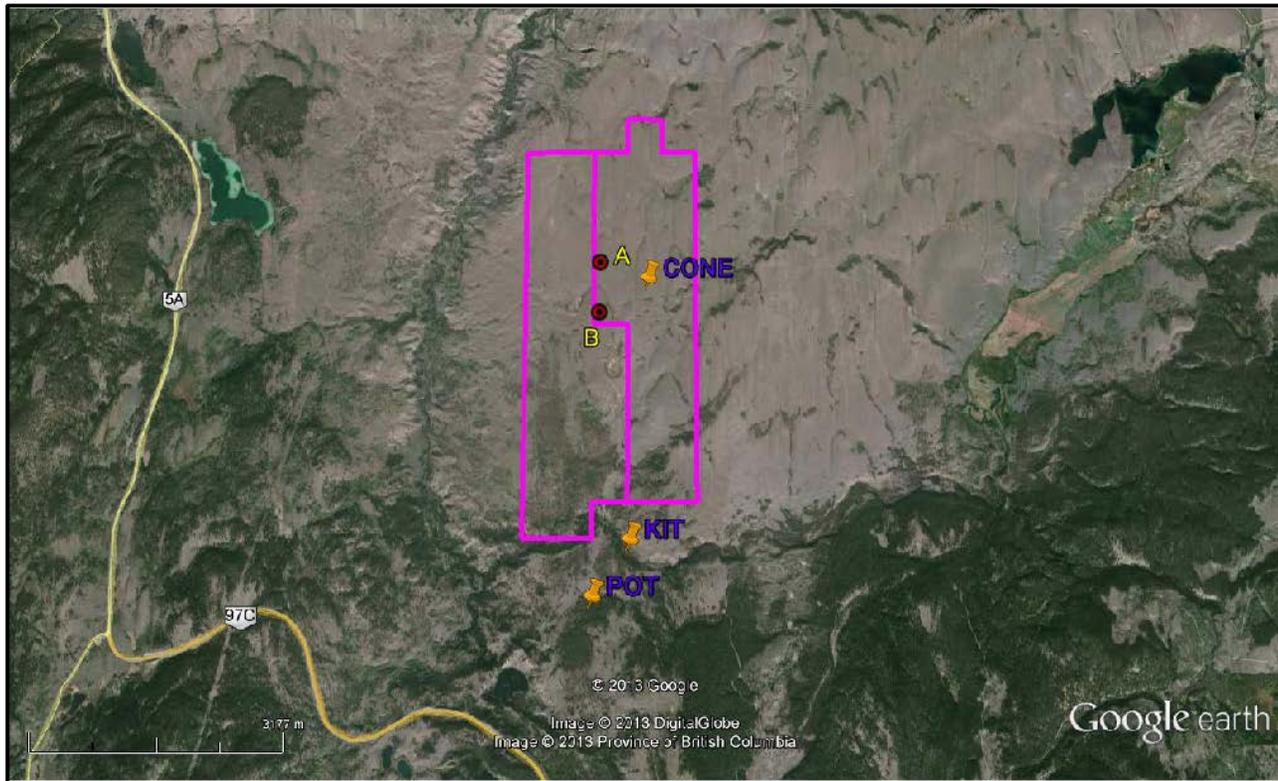
Fisher, 'Statistical Analysis of Circular Data',

1993, Cambridge University Press)

Note: The 95% confidence calculation uses

Fisher's (1993) 'large-sample method'

**Figure 8. Cross structural locations (Figure 6) on Google Earth**  
(Base map from MapPlace and Google Earth)



**Table II** Approximate UTM location of Figure 6.cross-structures & location of three Minfiles  
(Zone 10; UTM-NAD 83)

Location	UTM East	UTM North	Elevation
<b>A</b>	676,952	5,540,950	1,047
<b>B</b>	676,965	5,540,280	1,076
<b>Cone</b>	677,538	5,540,613	1,072
<b>Pot</b>	676,956	5,536,483	1,076
<b>Kit</b>	677,411	5,537,209	1,045

### **INTERPRETATION & CONCLUSIONS**

The structural analysis indicated two prime structural directions; north-south, and northwesterly. The north-striking structures or faults with related fracturing are primary regional structures, as indicated on the BC Government published geological map of the area and are probably influenced by the regional Kentucky-Alleyne fault system within one kilometre west.

The two claims of the structural analysis, Tenures 559067 & 559068, are almost totally located within the Central Belt or facies of the Nicola volcanics except for the southeast corner. The division between the two Belts is obviously based on the lithological variation of the volcanics rather than the Kentucky-Alleyne fault system which trends northerly through the central portion of the Claim Group. This is based on the 11 mineral occurrences described herein reportedly all occurring within the Property.

***Interpretation & Conclusions (cont'd)***

The numerous mineral occurrences within the Central Belt and the paucity of mineral occurrences in the Eastern Belt may be due to the proximity of the mineral generating system. It generally appears that the east-central portion of the Central Belt may be the crest of an anticline where parallel northerly structures were developed to accommodate the expansiveness of the rock at its crest. Regional differential horizontal forces thereafter were accommodated by the creation of the major structures at the location of the original structures. Thereby, a location of increased fracture density could have resulted in accommodating any hydrothermally mineralized fluids. The surface mineralization may be a surface indication of a mineralized porphyry system at depth.

A zone of increased fracture density is also located at the location of major cross structures such as at the two locations as determined from the structural analysis of Tenures 559067 & 559068. Although these claims are located within the Central Belt where a greater degree of mineral occurrences would be expected, the claims are east of the major structure. The CONE mineral showing (*Minfile 092HNE146*) shows only minor mineralization and is the lone Minfile mineral occurrence on the two claims and the easternmost nearest the Eastern Belt.

The CONE showing is located proximally north and some 600 metres southeast of structural intersection "A" and may be a weak indication of increased mineralization and/or other surficial geological indications at the "A" locale, of a mineral source at depth.

The KIT mineral showing (*Minfile 092HNE270*) adjacent and south of the structural analysis area is an example of a copper/molybdenum porphyry that was developing in a surficially exposed, minimally fractured granodiorite. In an environment of denser fractures this may have well developed into a Brenda type porphyry deposit where the grade of the orebody is a function of fracture (vein) density and of the thickness and mineralogy of the filling material.

Thus, the two structural locations as designated on Figures 6 & 8 are prospective areas to search for geological indicators of a potential economic mineral resource. These geological indicators may be revealed as minerals and/or alteration products and would be subject to interpretation as economic mineral indicators.

Excluding other variable geological conditions, the structures are essential in the localization of potentially economic mineralization. For mineral deposit types that may occur within the Toni 559067 Claim Group reference is made in the report to the 16 Minfile properties described herein. These Minfile descriptions, copied from the BC Government Minfile records, are shown on Figure 4 and are included herein as potential types of mineralization that should be sought subsequent to the exploration of the two prime A & B exploration areas.

Respectfully submitted  
Sookochoff Consultants Inc.



Laurence Sookochoff, PEng

**SELECTED REFERENCES**

**Cartwright, P.A., Cormier, P.C.** – Report on the Continuation of the Induced Polarization and Resistivity Survey on the Snowflake Claims for Lornex Mining Corporation. June 5, 1988. **AR 14,983.**

**Kerr, J.R.** – Geological, Geophysical, and Geochemical Report on the Aspen Grove Property for Etna Resources Inc. November 17, 2009. **AR 31,213.**

**MapPlace** – Map Data downloads

**Marshak, S., Mitra, G.** – Basic Methods of Structural Geology. pp 258-259, 264\*.Prentice-Hall Inc. 1988

**MtOnline** - MINFILE downloads.

092HNE036 - COPPER STAR	092HNE114 – CM
092HNE052 – TAB	092HNE144 – AU-WEN
092ISE054 – PORCUPINE	092HNE145 – SNOWFLAKE 6/BLUE JAY
092HNE058 – HN-WEN.	092HNE146 – CONE
092HNE061 – JUNE	092HNE147 –COURT 1
092HNE073 - BIG SIOUX	092HNE161 – DOR
092HNE084 – PAYCINCI	092HNE168 – TIMLISH LAKE
092ISE084 – MINT	092HNE203 – SKI

**Orr, N., Galeski, R.B.** – Geophysical Report of Magnetometer Survey on the Tab 1 to Tab 5 Mineral Claims for Norranco Mining & Refining Co. Ltd. 1972. **AR 3,115.**

**Ostler, J.** – Geology of the Aspen Grove Property with Emphasis on the Timmilsh Hydrothermal System. October 12, 2009. **AR 31,213.**

**Scott, A.** – Induced Polarization and Magnetometer Survey on the Grove Property Snowflake Claims for Cominco Ltd. July 1979. **AR 7,365.**

**Smitheringale, W.G.** – Diamond Drilling Report Snowflake 7 and Snowflake 10 Claims for Gerle Gold Ltd. July 27, 1988. **AR 18,019.**

**Sookochoff, L.** 2011: Geological Assessment Report on a Structural Analysis on Tenure 564570 of the Toni 563570 Claim Group for Victory Resources Corporation. **AR 32,624.**

**Sookochoff, L.** 2012: Geological Assessment Report on a Structural Analysis on Tenure 589951 of the Toni 589951 Claim Group for Victory Resources Corporation. **AR 33,155.**

**Windsor, D.M.** – Geochemical, and Geophysical Report on the Dor Claim for Redding Gold Corporation. February 28, 1988. **AR 17,554.**

**STATEMENT OF COSTS**

Work on Tenures 559067 & 559068 of the Porcupine 559067 Claim Group was done from August 1, 2013 to September 3, 2013 to the value as follows:

**Structural Analysis**

Laurence Sookochoff, PEng. 2.5days @ \$ 1,000.00/day ----	\$ 2,500.00
Maps -----	500.00
Report -----	<u>3,500.00</u>
	\$ 6,500.00
	=====

***CERTIFICATE***

I, Laurence Sookochoff, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geologist and principal of Sookochoff Consultants Inc. with an address at 120 125A-1030 Denman Street, Vancouver, BC V6G 2M6.

I, Laurence Sookochoff, further certify that:

- 1) I am a graduate of the University of British Columbia (1966) and hold a B.Sc. degree in Geology.
- 2) I have been practicing my profession for the past forty-seven years.
- 3) I am registered and in good standing with the Association of Professional Engineers and Geoscientists of British Columbia.
- 4) The information for this report is based on information as itemized in the Selected Reference section of this report and from periodic work the author has performed in the Aspen Grove area since the 1980's.
- 5) I have no interest in the Property as described herein.



Laurence Sookochoff, P. Eng.