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**Ministry of Energy, Mines & Petroleum Resources**
Mining & Minerals Division
BC Geological Survey

**Assessment Report**
**Title Page and Summary**

**TYPE OF REPORT [type of survey(s)]:** Geological Geophysical

**TOTAL COST:** $ 9,768.40

**AUTHOR(S):** Laurence Sookochoff, PEng

**SIGNATURE(S):** Laurence Sookochoff

**NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):**

**YEAR OF WORK:** 2015

**STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S):** 5567829 August 26, 1015

**PROPERTY NAME:** Tom Cat

**CLAIM NAME(S) (on which the work was done):** 1015128

**COMMODITIES SOUGHT:** Copper Gold

**MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:** 092HNEO56 / 087 / 088 / 089 / 166 / 177 / 256 / 257 / 258 / 259

**MINING DIVISION:** Nicola

**NTS/BCGS:** 092H.087 / .088 / .097 / .098

**LATITUDE:** 49 ° 52 ' 50 " **LONGITUDE:** 120 ° 33 ' 16 " **(at centre of work)**

**OWNER(S):**

1) Sierra Iron Ore Corporation

2)

**MAILING ADDRESS:**

132366 Cliffstone Court
Lake Country BC V4V 2R1

**OPERATOR(S) [who paid for the work]:**

1) Sierra Iron Ore Corporation

2)

**MAILING ADDRESS:**

132366 Cliffstone Court
Lake Country BC V4V 2R1

**PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):**

Pleistocene to Holocene volcanics. Upper Triassic Nicola Group Eastern and Central Volcanic Facies. Late Triassic to Early Jurassic dioritic to gabbroic intrusive rocks. Regional Kentucky-Alleyme Fault. Major northwesterly and northeasterly structures. Four cross-structures within Tenure 1015128. At the Tom Cat, chalcocite, magnetite, bornite, chalcopyrite, native copper and hematite over a width of 30 metres and a depth of at least 45 metres. One drill hole analyzed 0.32 per cent copper over 45 m.

**REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:** 6761 28782 29728 33742

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| TYPE OF WORK IN THIS REPORT | EXTENT OF WORK (IN METRIC UNITS) | ON WHICH CLAIMS | PROJECT COSTS APPORTIONED (incl. support) |
|---|---|---|---|
| **GEOLOGICAL (scale, area)** | | | |
| **Ground, mapping** | | | |
| **Photo interpretation** | 312 hectares | 1015128 | $ 6,000.00 |
| **GEOPHYSICAL (line-kilometres)** | | | |
| **Ground** | | | |
| **Magnetic** | 2.4 | 1015128 | 3,768.40 |
| **Electromagnetic** | | | |
| **Induced Polarization** | | | |
| **Radiometric** | | | |
| **Seismic** | | | |
| **Other** | | | |
| **Airborne** | | | |
| **GEOCHEMICAL (number of samples analysed for...)** | | | |
| **Soil** | | | |
| **Silt** | | | |
| **Rock** | | | |
| **Other** | | | |
| **DRILLING (total metres; number of holes, size)** | | | |
| **Core** | | | |
| **Non-core** | | | |
| **RELATED TECHNICAL** | | | |
| **Sampling/assaying** | | | |
| **Petrographic** | | | |
| **Mineralographic** | | | |
| **Metallurgic** | | | |
| **PROSPECTING (scale, area)** | | | |
| **PREPARATORY / PHYSICAL** | | | |
| **Line/grid (kilometres)** | | | |
| **Topographic/Photogrammetric (scale, area)** | | | |
| **Legal surveys (scale, area)** | | | |
| **Road, local access (kilometres)/trail** | | | |
| **Trench (metres)** | | | |
| **Underground dev. (metres)** | | | |
| **Other** | | | |
| | | **TOTAL COST:** | $ 9,768.40 |

Print Form

# SIERRA IRON ORE CORPORATION

## GEOLOGICAL & GEOPHYSICAL

## ASSESSMENT REPORT

*(Event 5567829)*



**Work done on Tenure 1015128**
*(from August 1, 2015 to October 6, 2015)*

*of the 11 claim*

## TOM CAT 1015128 CLAIM GROUP

***Nicola Mining Division***

***BCGS 092H.087/.088/.097/.098***

***British Columbia, Canada***

*Centred Near:*
**5,528,310 N, 675,741 E**
*(10 NAD: 83)*

*Author & Consultant:*

**Laurence Sookochoff, PEng.**
*Sookochoff Consultants Inc.*

*Submitted*
**January 10, 2016**

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**ILLUSTRATIONS**



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## SUMMARY

The Tom Cat 1015128 Claim Group ("Property") located 200 kilometres east-northeast of Vancouver within the historic Aspen Grove of south-central British Columbia, is comprised of 11 claims covering an area of 4827hectares. The Property is situated within the belt of Mesozoic rocks, including the Nicola Volcanics and intrusives, which host such major porphyry deposits as the recently revived Copper Mountain mine to the south and the world-class Highland Valley mine to the north.

Although most of the Minfile deposit types reported on herein as copied from the Minfile records, are volcanic redbed copper types and manifest zones of mineralization which are commonly restricted to localized fractures, the Big Sioux past producer and the Bloo mineral showing, two of the 10 mineral occurrences, are reported as porphyry type deposits.

In addition, the Big Kidd prospect, where a 300 metre wide breccia pipe reportedly hosting copper and gold values, may be an indication of mineral controlling cross-structures exposing indications of a potential concealed mineral resource at the surface.

In the structural analysis of Tenure 1015128, the four cross-structures delineated should be the locations of maximum fracture and/or breccia development and would be the principal structural controls for the deposition of any hydrothermal fluids sourced from a buried intrusive. A localized magnetometer survey, which included cross-structural location A, was performed to determine, and to interpret, the magnetic response within the cross-structural area.

In the interpretation of the magnetometer survey, which was completed over an area of indicated volcanics,

- the north-north-northwesterly trend of the anomalous magnetic configuration conforms to the trend of the southern portion of the indicated structure AB (Figure 5);
- the western anomalous mag HI may be an indication of a volcanic capped intrusive or a related intrusive to the intrusive shown on the geological map (Figure 4) near the western boundary of Tenure 1015128;
- the eastern anomalous mag LO may reflect the more definitive cross-structural area A which, in the structural analysis, was indicated as an approximate 125 metres west (Figure 11);
- the configuration of the 225 metre (N/S) long, up to 50 metre wide, and open to the east, anomalous mag LO may reflect the northerly trending structure AB and the northwesterly trend of not one but two parallel structures which confine the mag Lo to the north and to the south;
- the mag LO, in addition to indicating a dynamically altered structure, may indicate alteration caused by mineral bearing hydrothermal fluids sourced from concealed intrusive related porphyries beneath the volcanic cover;

The results of the magnetometer survey were successful in indicating the more definitive location of cross-structure A where the structural analysis resulted in an approximate location.

Thus, the area of the three cross-structures delineated within Tenure 1015128 would be most likely areas for surficial geological signatures of a mineral resource. These geological indicators may be revealed as pathfinder minerals, minerals and/or alteration products that would be subject to interpretation as economic mineral indicators. The cross-structural location "A" area should be the initial priority to explore for these geological indicators.

## INTRODUCTION

Between August 1, 2015 and October 6, 2015, a structural analysis and a localized magnetometer survey were completed on Tenure 1015128 of the 11 claim Toni 1015128 claim group (Property). The purpose of the program was to delineate potential structures and correlative magnetic responses which may be integral in indicating near surface indications and/or geological controls to a potential mineral resource.

Information for this report was obtained from sources as cited under Selected References.

*Figure 1*. **Location Map**
*(from MapPlace)*


## PROPERTY LOCATION and DESCRIPTION

### Location

The Property is located in the Nicola Mining Division of British Columbia Canada, 200 kilometres east-northeast of Vancouver and 19 kilometres south-southeast of Merritt.

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

*Figure 2.* **Property Location**
*Base Map from Google Earth)*

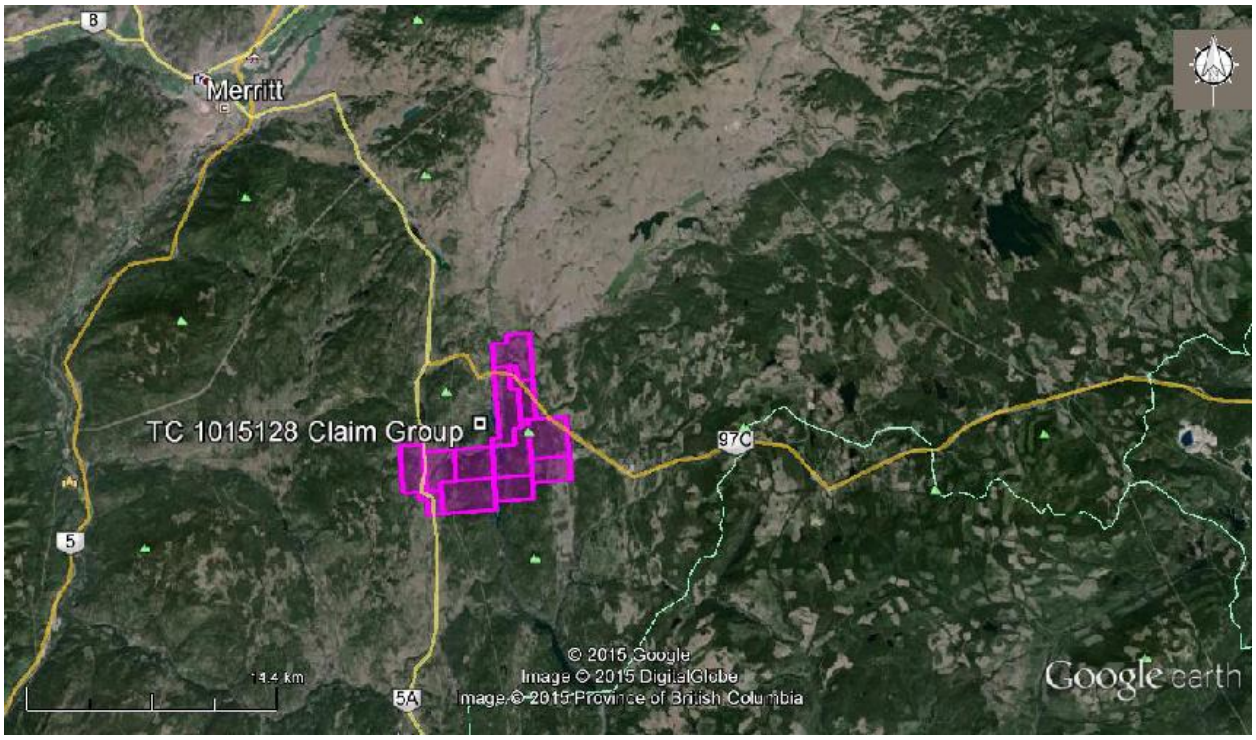
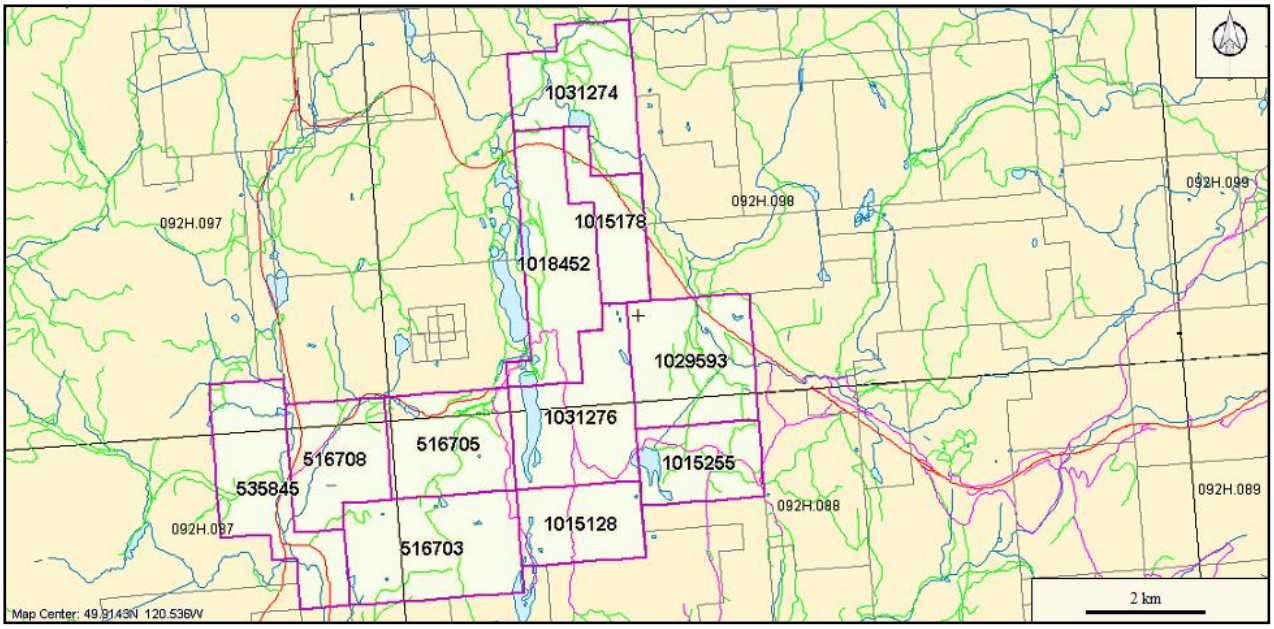



*Figure 3.* **Claim Map**
*(base map from MapPlace)*



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

**Description**

The Property consists of 11 contiguous claims totalling 4827.9244 hectares. Particulars are as follows:

*Table 1*. **TOM CAT 1015128 CLAIM GROUP TENURES**
*(from MtOnline)*

| Tenure Number | Type | Claim Name | Good Until | Area (ha) |
|---|---|---|---|---|
| 516703 | Mineral | | 20151231 | 582.976 |
| 516705 | Mineral | | 20151231 | 416.267 |
| 516708 | Mineral | | 20151231 | 374.651 |
| 535845 | Mineral | CASPER WEST | 20151231 | 520.39 |
| 1015128 | Mineral | BROWN | 20160410 | 312.2933 |
| 1015178 | Mineral | TC1281 | 20160410 | 270.3828 |
| 1015255 | Mineral | TC12111 | 20160410 | 312.2401 |
| 1018452 | Mineral | NAA1 | 20151231 | 540.8326 |
| 1029593 | Mineral | TC1 | 20160410 | 520.2206 |
| 1031274 | Mineral | POTHOLE LAKE NORTH | 20160128 | 457.3688 |
| 1031276 | Mineral | POTHOLE LAKE SOUTH | 20160128 | 520.3022 |

**On the approval of this assessment report*

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

**Access**

Access from Merritt is for four kilometres southeastward to the junction between Highways 5 and 5A; thence via Highway 5A southward for 24 kilometres to the junction between Highways 5A and 97C or the Aspen Grove junction; thence south via Highway 5A through Aspen Grove for five kilometres to the northern border of Tenure 516708 of the Tom Cat 1015128 Claim Group.

**Climate**

The region 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° and average 25°C with the winter temperatures reaching a low of -10° and averaging 8°. On the Property snow cover could be from December to April which should not hamper a year-round exploration program.

**Local Resources and Infrastructure**

Merritt 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.

**Physiography**

Within Tenure 1015128, the subject of the structural analysis, the topography is of predominantly gentle to moderate forested slopes with steep to rugged slopes adjacent to the east side of the confined Kentucky-Alleyne Lake valley.

Elevations range from 1,003 metres at a lake in the southwest to 1,310 metres at the southeast corner.

## HISTORY: PROPERTY AREA

The history on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers peripheral to the Tom Cat 1015128 Claim Group are reported as follows; the distance is from Tenure 1015128, the subject of the structural analysis.

**BIG SIOUX** past producer (Volcanic redbed Cu; Alkalic porphyry Cu-Au
MINFILE 092HNE073
Five kilometres north

*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.*

*The occurrence was restaked in 1989 after copper mineralization was exposed in a road cut 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. In 2003, Christopher James Gold Corp. drilled 9 holes and dug three trenches to test alkalic porphyry hosted by the Big Kidd breccia. Broad intervals of low-grade mineralization were encountered*

**PAYCINCI** prospect (Volcanic redbed Cu)
MINFILE 092HNE084
One kilometre north

*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).*

## HISTORY: PROPERTY

The history on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers within the Tom Cat 1015128 Claim Group are reported as follows.

**TOM CAT** prospect (Volcanic redbed-Cu; Subvolcanic-Cu-Ag-Au (As-Sb);
Porphyry Mo (Low F-type)
MINFILE 092HNE056
Within Tenure 516703

*The occurrence was initially prospected and trenched by W. Murray between 1906 and 1913. Pyramid Mining Company Ltd. drilled 13 holes totalling 1042 metres in 1965.*

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

**BOOMERANG** showing (Volcanic redbed Cu)
MINFILE 092HNE087
Within Tenure 516703

*This showing was explored as early as 1901. Several trenches and shallow shafts were excavated by 1904 and two diamond-drill holes were drilled by 1928. Scope Development Ltd. and Alscope Consolidated Ltd. conducted trenching, soil sampling, geophysical surveying and some diamond drilling in 1964 and 1967. Various geological, geochemical and geophysical surveys were completed by F. Gingell between 1976 and 1981, Vanco Explorations Ltd. in 1985 and Laramide Resources Ltd. in 1987.*

**PORTLAND** showing (Volcanic redbed Cu)
MINFILE 092HNE088
Within Tenure 516703

*The Portland showing is 1.95 kilometres west-northwest of the north end of Bluey Lake and 2.6 kilometres southwest of the south end of Kentucky Lake.*

*This occurrence was explored periodically between 1900 and 1905. Portland Mining Company excavated a shaft, 35 metres deep and a drift from the bottom of the shaft, 32 metres long, in 1905.*

**BUNKER HILL** showing (Volcanic redbed Cu)
MINFILE 092HNE089
Within Tenure 516703

*The Bunker Hill showing is 1.05 kilometres west-southwest of the north end of Bluey Lake and 2.25 kilometres southwest of the south end of Kentucky Lake*

**AM** showing (Volcanic redbed Cu)
MINFILE 092HNE166
Within Tenure 516705

*The Am showing is 1.7 kilometres north-northwest of the north end of Bluey Lake and 600 metres west of the south end of Kentucky Lake.*

**AR** showing (Volcanic redbed Cu)
MINFILE 092HNE177
Within Tenure 516705

*The AR showing is 2.6 kilometres northwest of the north end of Bluey Lake and 2.0 kilometres west-northwest of the south end of Kentucky Lake.*

**DALRYMPLE** showing (Volcanic redbed Cu)
MINFILE 092HNE256
Within Tenure 535845

*The Dalrymple showing is 2.5 kilometres south-southwest of the south end of Kidd Lake and 2.3 kilometres northeast of the north end of Dodds Lake.*

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

**BLOO** showing (Alkalic porphyry Cu-Au; Volcanic redbed Cu)
MINFILE 092HNE257
Within Tenure 516705

*The Bloo showing is 1.8 kilometres north-northwest of the north end of Bluey Lake and 1.4 kilometres west-southwest of the south end of Kentucky Lake.*

**AR2** showing (Volcanic redbed Cu)
MINFILE 092HNE258
Within Tenure 516705

*The AR 2 showing is 2.4 kilometres north-northwest of the north end of Bluey Lake and 1.25 kilometres northwest of the south end of Kentucky Lake.*

**AL2** showing (Volcanic redbed Cu)
MINFILE 092HNE259
Within Tenure 1015128

*The AL 2 showing is 1.4 kilometres south-southwest of the south end of Miner Lake and 2.9 kilometres southeast of the south end of Kidd Lake.*

## 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 which has been divided into western, central, and eastern belts on the basis of lithology and lithogeochemistry and by major fault systems. Variation from calc-alkaline to shoshinitic compositions from west to east has been interpreted to reflect eastward dipping subduction in the Nicola arc. The Vault 246374 Claim Group is situated within the eastern belt of the Nicola Group.

## GEOLOGY: PROPERTY AREA

The geology on some of the more significant mineral are reported as follows; the distance is from Tenure 1015128, the subject of the structural analysis.

**BIG SIOUX** past producer (Volcanic redbed Cu; Alkalic porphyry Cu-Au
MINFILE 092HNE073
Five kilometres north

*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.*

*The occurrence is hosted in variably amphibole, augite and feldspar porphyritic basaltic andesite, subjected to extensive fracturing, shearing and faulting. Alteration minerals include abundant epidote, and minor silica and chlorite. Some microdiorite and diorite are also present.*

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

**PAYCINCI** prospect (Volcanic redbed Cu)
MINFILE 092HNE084
One kilometre north

*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.*

*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.*

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

*The AU 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.*

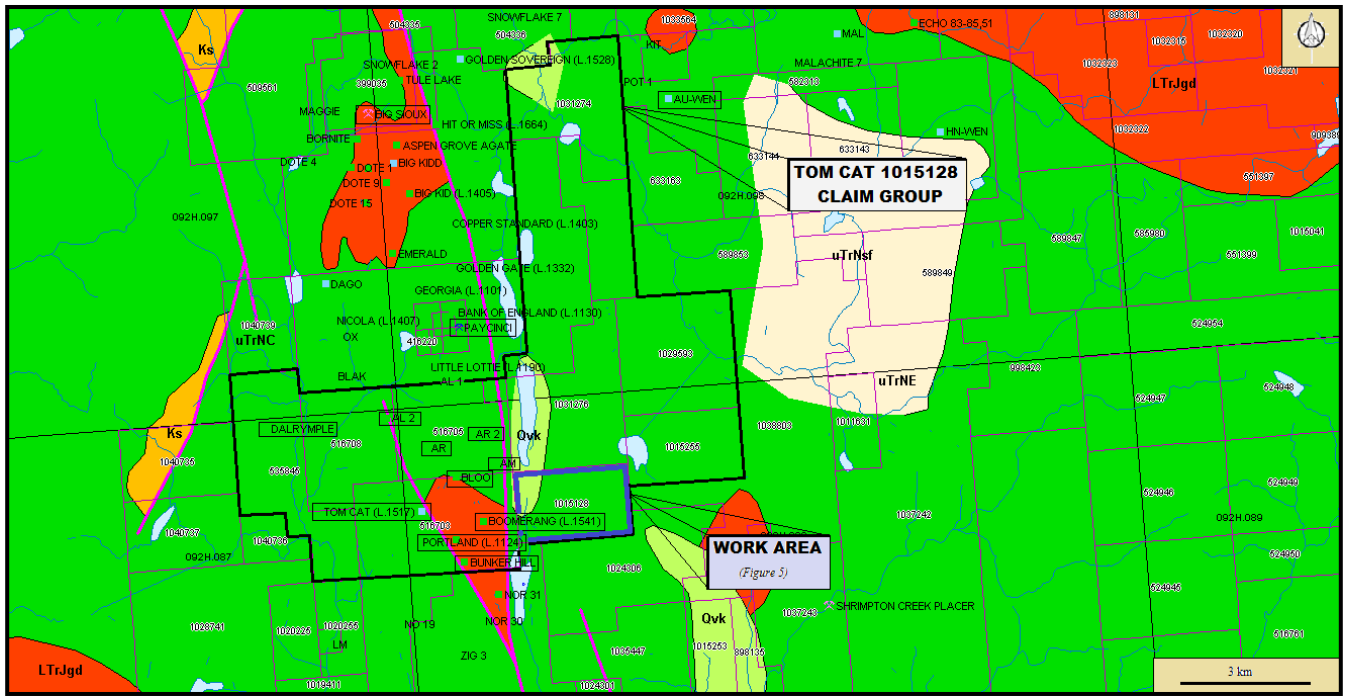
*The occurrence lies in the northern assemblage of the Eastern belt of the Nicola Group (after Preto, Bulletin 69). This assemblage mainly consists of well-bedded submarine volcaniclastic rocks, ranging from tuffaceous volcanic siltstones characteristic of the lower part, to coarse volcanic conglomerate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

*Figure 4* **Geology, Claim, Index & Minfiles**

*(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*

***uTrNMl***

*lower amphibolite/kyanite grad metamorphic rocks*

***uTrJum***

*unnamed ultramafic rocks*

***Central Volcanic Facies***

***uTrNc***

*andesitic volcanic rocks*

***Middle Jurassic***

***MJgr***

*unnamed, granite, alkalic feldspar granite intrusive rocks*

***Late Triassic to Early Jurassic***

***LTrJgd***

*unnamed granodiorite intrusive rocks*

***LTrJdr***

*dioritic to gabbroic intrusive rocks*

## GEOLOGY: PROPERTY

As indicated by the BC government supported MapPlace geological maps, the regional north trending Kentucky-Alleyne bisects the Toni 909429 Claim Group with the Nicola Central Volcanic Facies (UTrNC) comprised of andesitic volcanic rocks in the west and the Nicola Eastern Volcanic Facies comprised of basaltic rocks (UTrNE) in the east.

Late Triassic to Early Jurassic dioritic to gabbroic intrusive rocks outcrop within the Central portion of the Nicola Volcanics where the major portion of mineralization occurs.

The geology on some of the more significant mineral MINFILE reported showings and prospects within the Tom Cat 1015128 Claim Group are reported as follows.

**TOM CAT** prospect (Volcanic redbed-Cu; Subvolcanic-Cu-Ag-Au (As-Sb);
Porphyry Mo (Low F-type)
MINFILE 092HNE056
Within Tenure 516703

*This deposit is hosted in green laharic breccia or basaltic flow breccia near the contact with red laharic breccia of the Upper Triassic Nicola Group (Central belt, Bulletin 69). The unit strikes north-northwest and dips 60 degrees east. Massive basaltic flows outcrop to the northeast. Alteration of the breccia consists of some chloritization of olivine and pyroxene, and sericitization of feldspar.*

**BOOMERANG** showing (Volcanic redbed Cu)
MINFILE 092HNE087
Within Tenure 516703

*Chalcocite, bornite and malachite occur along fractures in fine- grained diorite (microdiorite) or dioritized volcanics of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

**PORTLAND** showing (Volcanic redbed Cu)
MINFILE 092HNE088
Within Tenure 516703

*Chalcocite, magnetite and hematite occur in a fracture zone in red and green laharic breccia of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

**BUNKER HILL** showing (Volcanic redbed Cu)
MINFILE 092HNE089
Within Tenure 516703

*Several trenches and old pits expose chalcocite, bornite, chalcopyrite, pyrite, malachite and azurite in brecciated and altered pyroxene plagioclase porphyritic andesite of the Upper Triassic Nicola Group (Central belt, Bulletin 69). Brown carbonate (?) alteration is associated with sulphide mineralization.*

**AM** showing (Volcanic redbed Cu)
MINFILE 092HNE166
Within Tenure 516705

*Chalcopyrite, bornite and chalcocite form disseminations and stringers in shear zones within massive green volcanic breccia and lahar deposits of the Upper Triassic Nicola Group (Central belt, Bulletin 69.*

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

**AR** showing (Volcanic redbed Cu)
MINFILE 092HNE177
Within Tenure 516705

*Two closely-spaced trenches expose chalcopyrite and bornite in green volcanic breccia and lahar deposits of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

**DALRYMPLE** showing (Volcanic redbed Cu)
MINFILE 092HNE256
Within Tenure 535845

*Quartz-epidote-carbonate veinlets mineralized with chalcopyrite and malachite occur in andesite and dacite of the Upper Triassic Nicola Group (Western belt, Bulletin 69).*

**BLOO** showing (Alkalic porphyry Cu-Au; Volcanic redbed Cu)
MINFILE 092HNE257
Within Tenure 516705

*Chalcopyrite, malachite and hematite occur in fine-grained diorite or dioritized volcanics of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

**AR2** showing (Volcanic redbed Cu)
MINFILE 092HNE258
Within Tenure 516705

*An old shaft exposes malachite and chalcocite in volcanic breccia and lahar deposits of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

**AL2** showing (Volcanic redbed Cu)
MINFILE 092HNE259
Within Tenure 1015128

*Copper mineralization occurs in limy siltstone and impure limestone near the contact with green volcanic breccia of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

## MINERALIZATION: PROPERTY AREA

The mineralization on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers peripheral to the Tom Cat 1015128 Claim Group are reported as follows; the distance is from Tenure 1015128, the subject of the structural analysis.

**BIG SIOUX** past producer (Volcanic redbed Cu; Alkalic porphyry Cu-Au
MINFILE 092HNE073
Five kilometres north

*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.*

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

**Big Sioux** *past producer (cont'd)*

*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).*

**PAYCINCI** prospect (Volcanic redbed Cu)
MINFILE 092HNE084
One kilometre north

*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, page 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.*

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

*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).*

*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

**TOM CAT** prospect (Volcanic redbed-Cu; Subvolcanic-Cu-Ag-Au (As-Sb); Porphyry Mo (Low F-type)
MINFILE 092HNE056
Within Tenure 516703

*The laharic breccia is erratically mineralized with chalcocite, magnetite, bornite, chalcopyrite, native copper and hematite, as disseminations and fracture coatings. Trenching and diamond drilling has intersected this mineralization over a width of 30 metres and a depth of at least 45 metres.*

*One drillhole analysed 0.32 per cent copper over 45.7 metres (Minister of Mines Annual Report 1965, page 157, hole 1). Two chip samples assayed 2.4 and 1.6 per cent copper over 2.1 and 3.0 metres respectively (Minister of Mines Annual Report 1913, page 223).*

**BOOMERANG** showing (Volcanic redbed Cu)
MINFILE 092HNE087
Within Tenure 516703

*Chalcocite, bornite and malachite occur along fractures in fine- grained diorite (microdiorite) or dioritized volcanics of the Upper Triassic Nicola Group (Central belt, Bulletin 69). The diorite is chloritized and occasionally brecciated. Where brecciated, blebs and stringers of bornite, chalcocite and malachite occur between the fragments. Abundant disseminated magnetite, calcite and epidote are reported to accompany the brecciation. The mineralized zone appears to trend northwest. Three of five rock samples analysed 0.183 to 2.34 per cent copper, 0.4 to 7.9 grams per tonne silver and 0.016 to 0.980 gram per tonne gold (Assessment Report 14141, Drawing 5b, samples 2003, 2205, 2563).*

*A selected sample assayed 14.7 per cent copper, 4.1 grams per tonne gold and 74.1 grams per tonne silver (Minister of Mines Annual Report 1901, page 1183).*

*Similar mineralization occurs 350 metres northwest, where chalcocite, malachite and azurite form fracture coatings in several narrow, north-striking shears in chloritized diorite.*

*Additional mineralization is found 200 metres west of the shears, where malachite and chalcocite occur at the intersections of shears striking 060 and 150 degrees in red andesite breccia.*

**PORTLAND** showing (Volcanic redbed Cu)
MINFILE 092HNE088
Within Tenure 516703

*The mineralized zone is reported to be over 9 metres wide. A sample from about 100 tonnes of dump material assayed 0.4 per cent copper (Minister of Mines Annual Report 1913, page 223). A sample from an opencut assayed 0.9 per cent copper (Minister of Mines Annual Report 1901, page 1183).*

**BUNKER HILL** showing (Volcanic redbed Cu)
MINFILE 092HNE089
Within Tenure 516703

*A rock sample analysed 0.391 per cent copper (Assessment Report 14141, Figure 5b, sample 88603).*

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

***Bunker Hill showing*** *(cont'd)*

*Copper mineralization is also found 470 metres east-southeast of the trenches, in red volcanic breccia and lahar deposits. Four rock samples analysed 0.229 to 0.857 per cent copper (Assessment Report 14141, Figure 5b, samples 2211, 2285, 2286, 2289).*

**AM** showing (Volcanic redbed Cu)
MINFILE 092HNE166
Within Tenure 516705

*A chip sample from an old shaft assayed 2.05 per cent copper over 1.6 metres (Assessment Report 6821, page 4).*

**AR** showing (Volcanic redbed Cu)
MINFILE 092HNE177
Within Tenure 516705

*Two closely-spaced trenches expose chalcopyrite and bornite in green volcanic breccia and lahar deposits of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

**DALRYMPLE** showing (Volcanic redbed Cu)
MINFILE 092HNE256
Within Tenure 535845

*A rock sample analysed 0.18 per cent copper and 0.9 gram per tonne silver (Assessment Report 10497, page 6, sample PR-4).*

**BLOO** showing (Alkalic porphyry Cu-Au; Volcanic redbed Cu)
MINFILE 092HNE257
Within Tenure 516705

*A rock sample analysed 0.483 per cent copper and 1.7 grams per tonne silver (Assessment Report 14141, Drawing 5b, sample 2574).*

*Three rock samples taken in the vicinity of an old shaft in diorite, 250 metres east-northeast, yielded 0.428 to 0.795 per cent copper (Assessment Report 20551, Figure 3).*

**AR2** showing (Volcanic redbed Cu)
MINFILE 092HNE258
Within Tenure 516705

*An old shaft exposes malachite and chalcocite in volcanic breccia and lahar deposits of the Upper Triassic Nicola Group (Central belt, Bulletin 69).*

**AL2** showing (Volcanic redbed Cu)
MINFILE 092HNE259
Within Tenure 1015128

*A sample analysed 1.43 per cent copper and 0.001 gram per tonne gold (Assessment Report 20551, Figure 3, Sample Al 90001).*

## STRUCTURAL ANALYSIS

A DEM image hillside shade map downloaded from MapPlace was utilized as the base map for the structural analysis on Tenure 1015128. A total of 85 structurally indicated lineaments were marked (Figure 5), compiled into a 10 degree class interval, and plotted as a rose diagram as indicated on Figure 6.

The centre of the work area is at 5,528,310N, 675,714E (10NAD 83).

*Figure 5.* **Indicated Structures on Tenure 1015128**

*(Base map from MapPlace)*

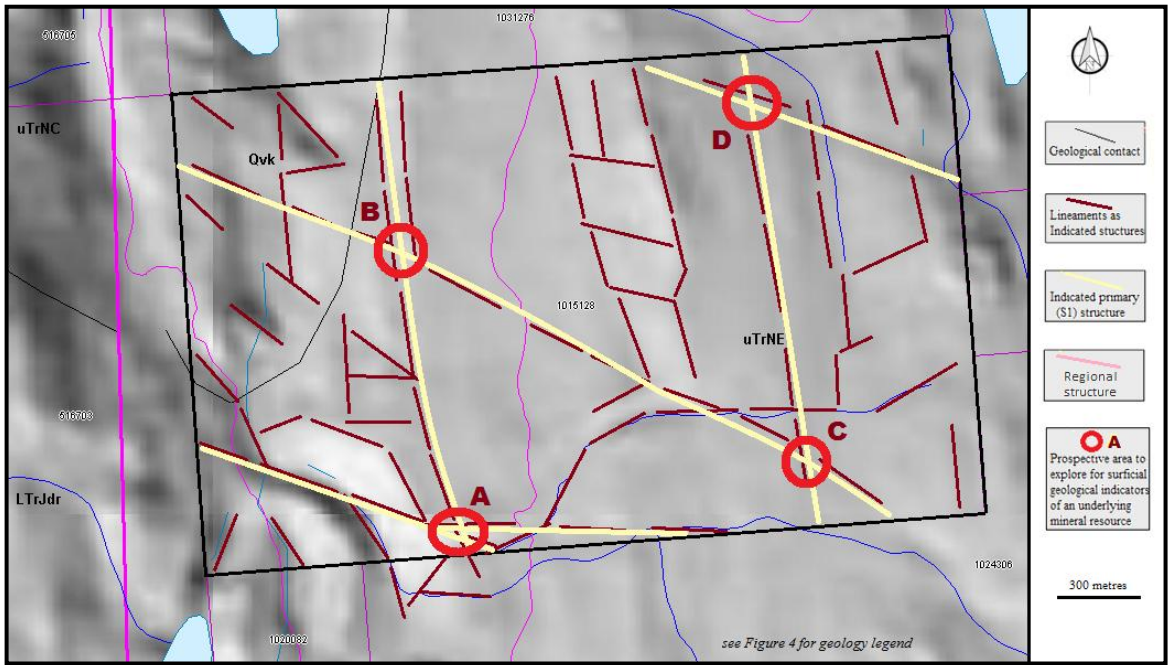
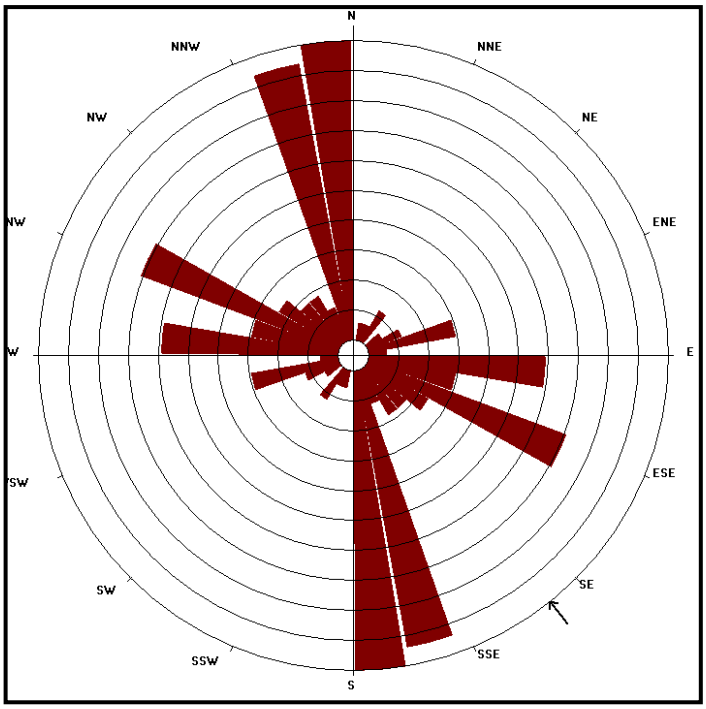



*Figure 6.* **Rose Diagram from Indicated structures**

*(Based on Lineaments from Figure 5)*



***Structural Analysis** (cont'd)*

**STATISTICS**

Axial (non-polar) data
No. of Data = 85
Sector angle = 10°
Scale: tick interval = 3% [2.6 data]
Maximum = 21.2% [18 data]
Mean Resultant dir'n = 141-321
[Approx. 95% Confidence interval = ±23.5°]
(valid only for unimodal data)

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Mean Resultant dir'n = 140.8 - 320.8
Circ.Median = 135.0 - 315.0
Circ.Mean Dev.about median = 34.8°
Circ. Variance = 0.25
Circular Std.Dev. = 43.83°
Circ. Dispersion = 3.52
Circ.Std Error = 0.2035
Circ.Skewness = 1.36
Circ.Kurtosis = -9.04

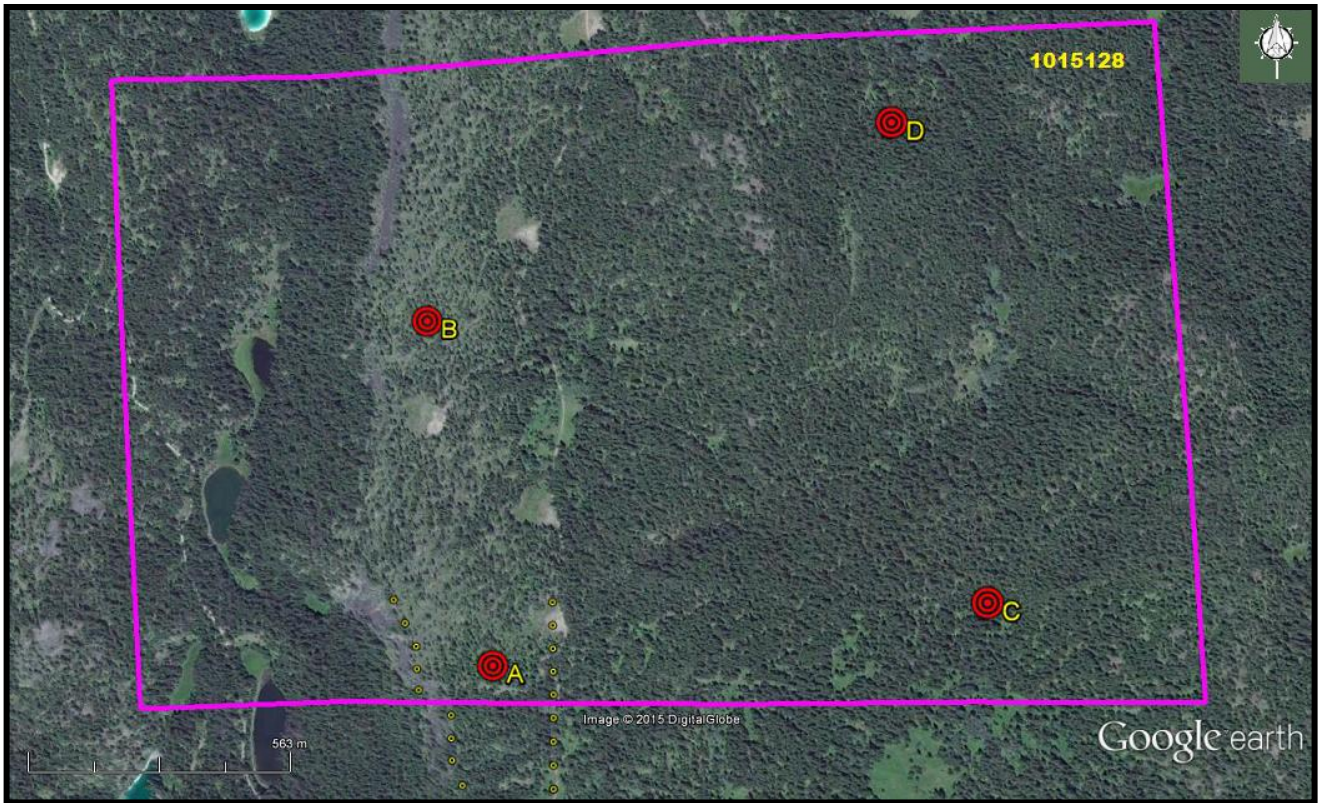
kappa = 0.65
(von Mises concentration param. estimate)

Resultant length = 26.38
Mean Resultant length = 0.3103

'Mean' Moments: Cbar = 0.062; Sbar = -0.304
'Full' trig. sums: SumCos = 5.273; Sbar = -25.8442
Mean resultant of doubled angles = 0.3218
Mean direction of doubled angles = 175

(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 7.* ***Cross-structures on Google Earth***
*(Base map from Google Earth)*



***Structural Analysis** (cont'd)*

*Table II.* **Approximate location of cross structures of Tenure 1015128**

*(UTM NAD 83)*

| Location | UTM North | UTM East | Elevation (m) |
|---|---|---|---|
| **A** | 5,527,660 | 675,394 | 1,127 |
| **B** | 5,528,403 | 675,250 | 1,097 |
| **C** | 5,527,810 | 676,428 | 1,240 |
| **D** | 5,528,804 | 676,244 | 1,202 |

## Magnetometer Survey

### a) Instrumentation

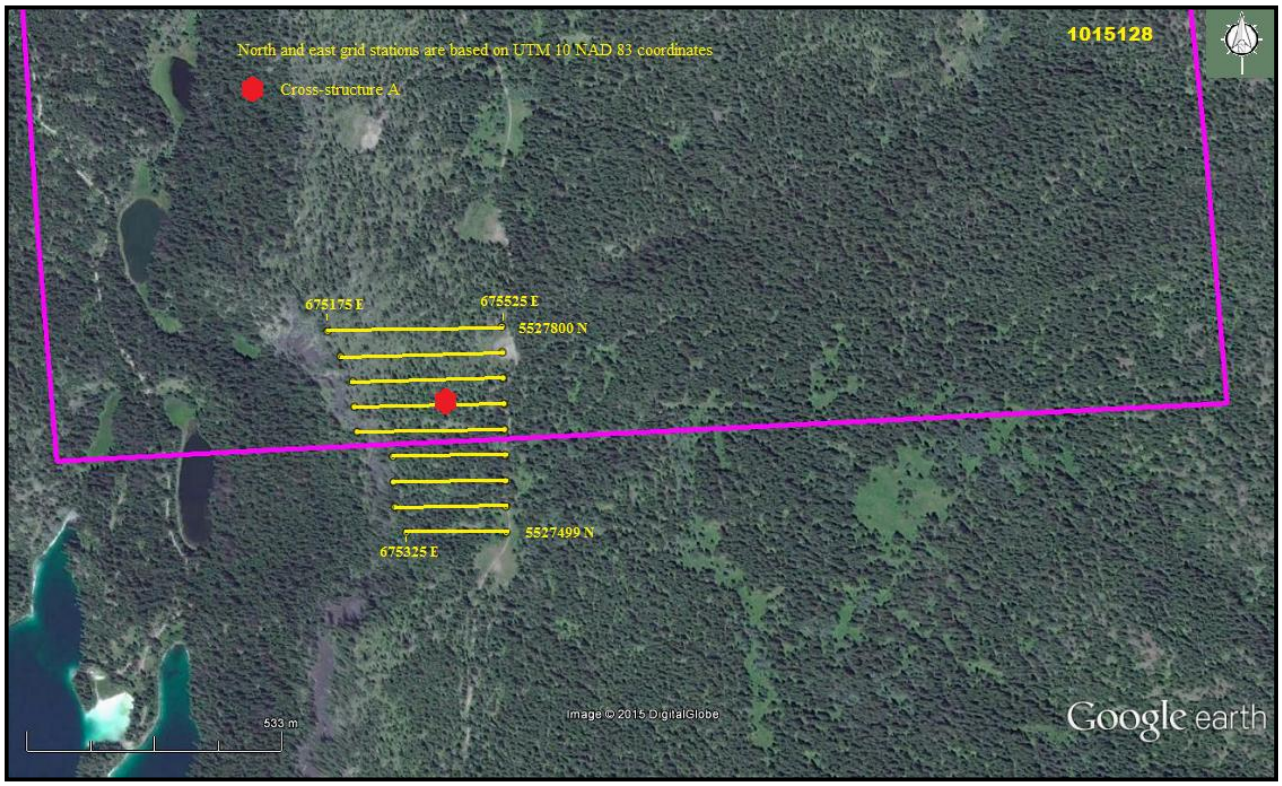
A Scintrex MF 2 Model magnetometer was used for the magnetometer survey. Diurnal variations were corrected by taking repeated readings at a base point throughout the day. Magnetometer values are total intensity and relative.

### b) Theory

Only two commonly occurring minerals are strongly magnetic, magnetite and pyrrhotite; magnetic surveys are therefore used to detect the presence of these minerals in varying concentrations. Magnetics is also useful is a reconnaissance tool for mapping geologic lithology and structure since different rock types have different background amounts of magnetite and/or pyrrhotite.

*Figure 8.* **Magnetometer Grid Index Map**

*(Base from MapPlace)*

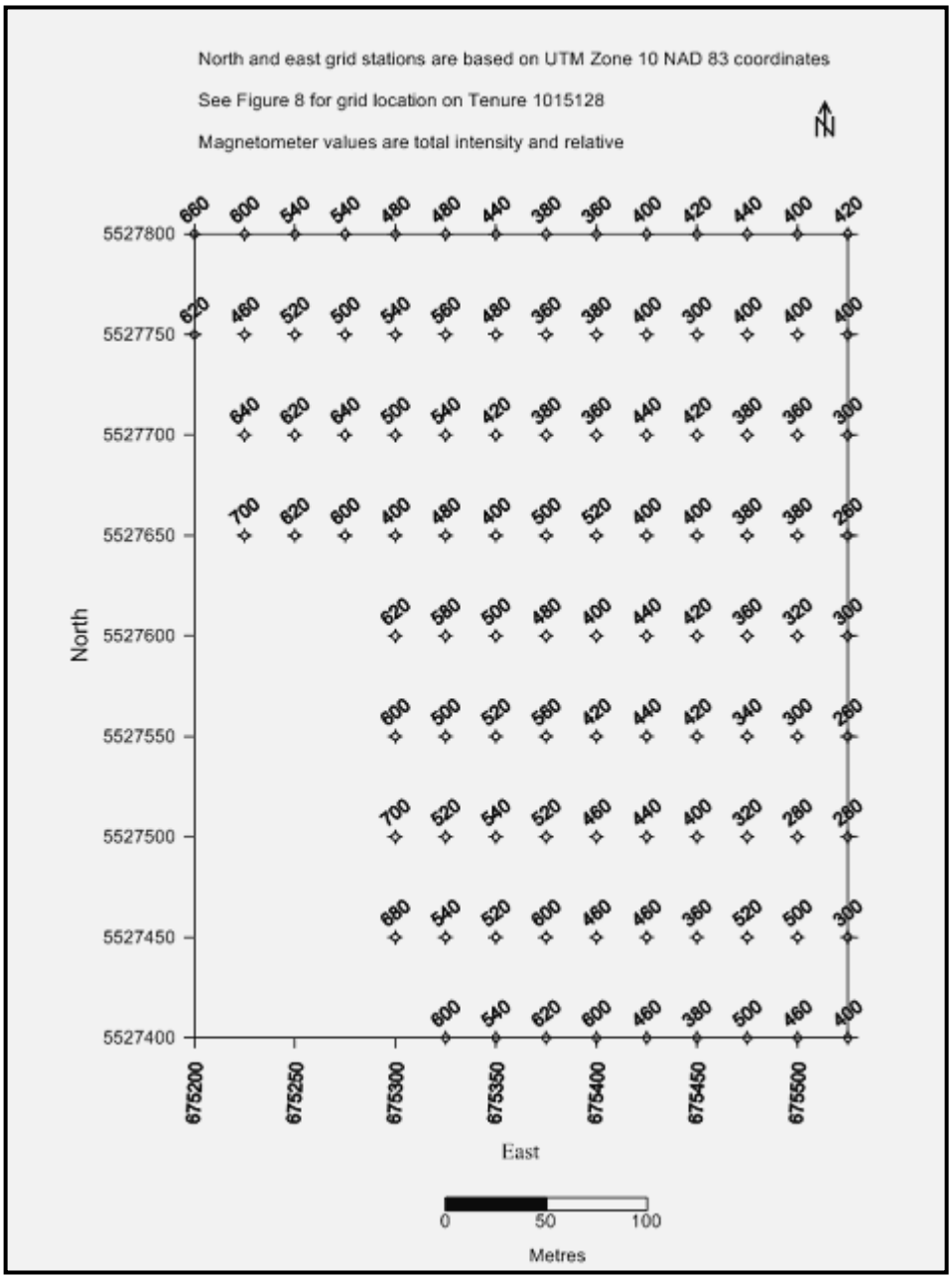


***Magnetometer Survey*** *(cont'd)*

**c) Survey Procedure**

A 400 metre base line was established from 5527400N 675525E northward to 5527800N 675525E with base line stations at every 50 metres. From each of the nine base line stations magnetometer readings were taken at 25 metre intervals westerly to 675325E along grid line 5527400E increasingly westward along each grid line to 675175E at grid line 5527800E. The westward grid-line limits were at an impassable cliff face. The grid line stations were established with a GPS instrument. Line kilometres of magnetometer survey completed was 2.4. The field results are reported herein in Appendix I.

*Figure 9* .**Magnetometer Survey Grid & Raw Data**
*(Base from MapPlace)*

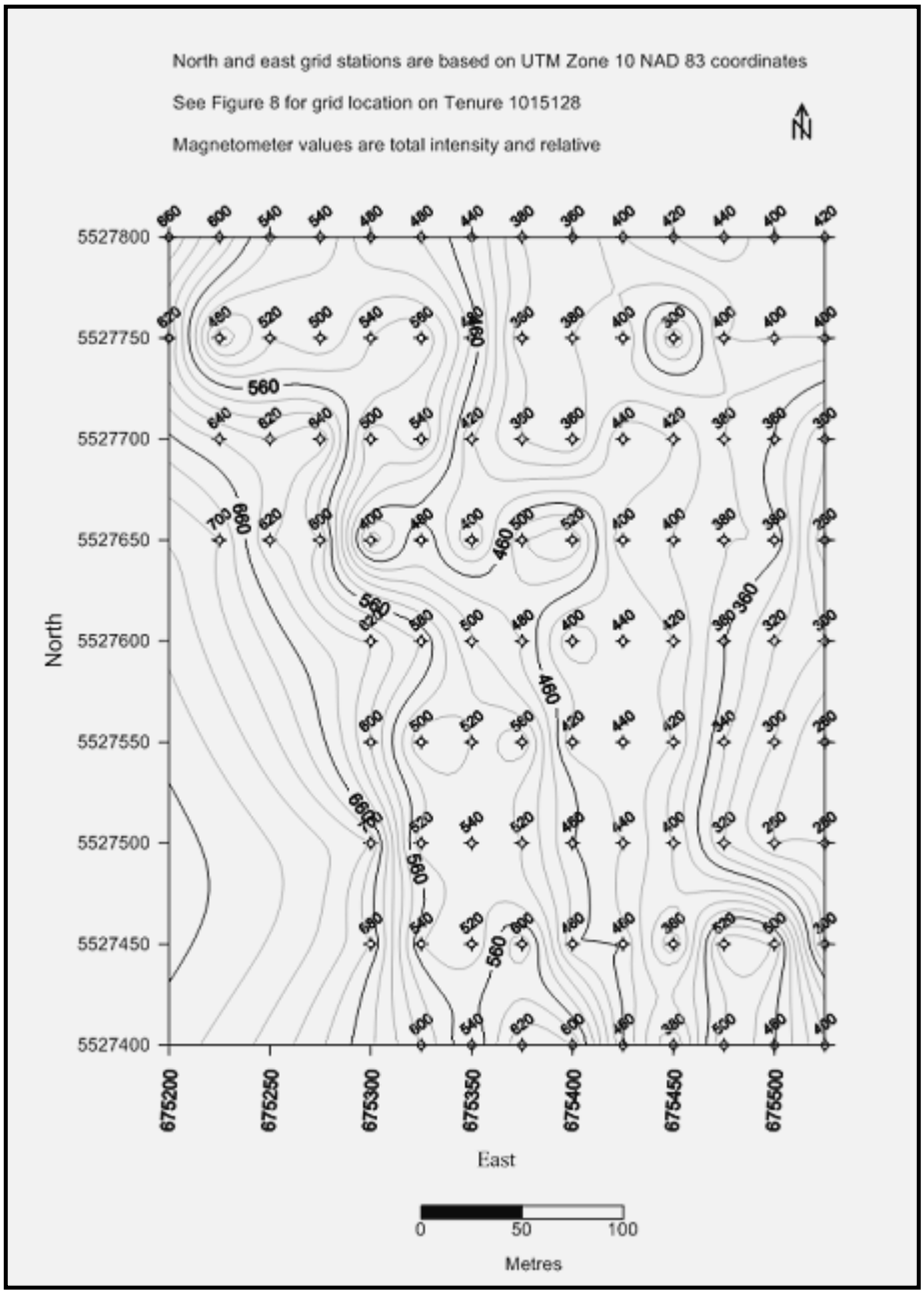


***Magnetometer Survey*** *(cont'd)*

**d) Data Reduction**

The field results were initially input to an Exel spreadsheet whereupon a Surfer 31 program was utilized to create the maps exemplified herein as Figures 9, 10, & 11.

*Figure 10.* **Magnetometer Survey Contour Map**

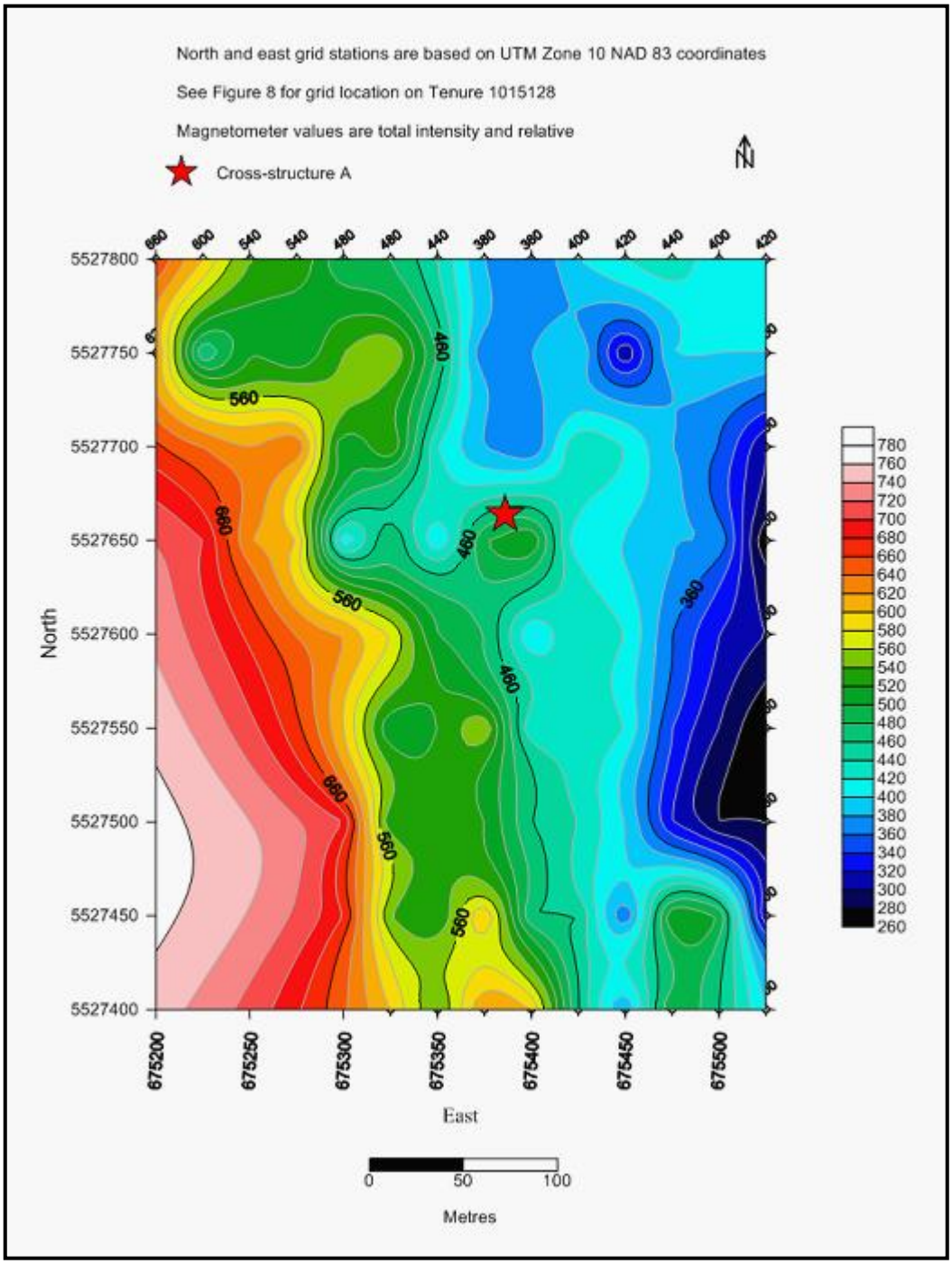


***Magnetometer Survey*** *(cont'd)*

**e) Results**

The magnetometer survey, which was over Nicola volcanics, indicated a 50 metre to 200 metre wide north-northwesterly band of background magnetic values with increasing magnetic values to anomalous magnetic high's (mag HI) to, and open to the west, and decreasing magnetic values to anomalous magnetic low (mag LO) to, and open, to the east.

*Figure 11.* **Magnetometer Survey Coloured Contour Map**



## INTERPRETATION and CONCLUSIONS

In the structural analysis of Tenure 1015128, four cross-structures were delineated which were generated between two northerly trending and three northwesterly trending indicated structures. As these cross-structural locations would be the locations of maximum fracture and/or breccia development, they would be prime exploration areas to explore for surficial geological indicators of a potential concealed mineral resource.

Many variable mineral occurrences within, and in the area of, the Tom Cat Claim Group manifest zones of mineralization which are commonly restricted to localized fractures. These isolated fractures may have been the only open spaces available for mineral deposition and could be an indication of surface mineral seepage from a deep-seated source.

Although most of the Minfile deposit types reported on herein, as copied from the Minfile records, are volcanic redbed copper types and manifest zones of mineralization which are commonly restricted to localized fractures, the Big Sioux past producer and the Bloo mineral showing, two of the 10 mineral occurrences, are reported as porphyry type deposits.

In addition, the Big Kidd prospect, where a 300 metre wide breccia pipe reportedly hosting copper and gold values, may be an indication of mineral controlling cross-structures exposing indications of a potential concealed mineral resource at the surface. A localized magnetometer survey, which included cross-structural location A, was performed to determine, and to interpret, the magnetic response within the cross-structural area.

In the interpretation of the magnetometer survey, which was completed over an area of indicated volcanics,

- the north-north-northwesterly trend of the anomalous magnetic configuration conforms to the trend of the southern portion of the indicated structure AB (Figure 5);
- the western anomalous mag HI may be an indication of a volcanic capped intrusive or a related intrusive to the intrusive shown on the geological map (Figure 4) near the western boundary of Tenure 1015128;
- the eastern anomalous mag LO may reflect the more definitive cross-structural area A which, in the structural analysis, was indicated as an approximate 125 metres west (Figure 11);
- the configuration of the 225 metre (N/S) long, up to 50 metre wide, and open to the east, anomalous mag LO may reflect the northerly trending structure AB and the northwesterly trend of not one but two parallel structures which confine the mag Lo to the north and to the south;
- the mag LO, in addition to indicating a dynamically altered structure, may indicate alteration caused by mineral bearing hydrothermal fluids sourced from concealed intrusive related porphyries beneath the volcanic cover;

The results of the magnetometer survey were successful in indicating the more definitive location of cross-structure A where the structural analysis resulted in an approximate location.

Thus, the four cross-structures delineated within Tenure 1015128 would be most likely areas for surficial geological signatures of a mineral resource. These geological indicators may be revealed as pathfinder minerals, minerals and/or alteration products that would be subject to interpretation as economic mineral indicators. The cross-structural location “A” area should be the initial priority to explore for these geological indicators.

Respectfully submitted,
Sookochoff Consultants Inc.

Laurence Sookochoff, PEng

## STATEMENT OF COSTS

Work on Tenure 1015128 was completed from August 1, 2015 to October 6, 2015 to the value as follows:

| | |
|---|---|
| **Structural Analysis** | |
| Laurence Sookochoff, P Eng. 3 days @ $ 1,000.00/day ---------- | $ 3,000.00 |
| **Magnetometer Survey** | |
| Christopher Delorme & Guy Delorme | |
| October 5-6, 2015 | |
| Four man days @ $300.00 per day ---------- | 1,200.00 |
| Truck rental, kilometre charge, fuel, room & board, | |
| mag rental ---------- | 1,318.40 |
| | $ 5,518.40 |
| Maps ---------- | 750.00 |
| Report ---------- | 3,500.00 |
| | $ 9,768.40 |
| | ====== |

## REFERENCES

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**MapPlace** – Map Data downloads.

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092HNE056 – TOM CAT
092HNE087 – BOOMERANG
092HNE088 – PORTLAND
092HNE089 – BUNKER HILL
092HNE166 – AM
092HNE177 – AR
092HNE256 – DALRYMPLE
092HNE257 – BLOO
092HNE258 – AR2
092HNE259 – AL2

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**Sheldrake, R.** - 3D Induced Polarization Survey. Geophysical Report for Max Investments on behalf of Bold Ventures Inc. on the Kentucky Lake Project. September 25, 2006.

. 3D Induced Polarization Survey on the Kentucky Lake Property, Merritt Area BC. October, 2006.

**Sookochoff, L**. Geological Assessment Report on the Tom Cat 516705 Claim Group for Sierra Iron Ore. March 2, 2013. AR 33,742.

## 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-nine 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 Reference section of this report and from a Tom Cat property examination.

5) I have no interest in the Tom Cat property as described herein.


Laurence Sookochoff, PEng.

*Appendix I*

**Magnetometer Data**

**E5567829 T1015128**

| East | North | Mag | East | North | Mag | East | North | Mag |
|---|---|---|---|---|---|---|---|---|
| 675525 | 5527800 | 420 | 675525 | 5527650 | 260 | 675525 | 5527500 | 280 |
| 675500 | 5527800 | 400 | 675500 | 5527650 | 380 | 675500 | 5527500 | 280 |
| 675475 | 5527800 | 440 | 675475 | 5527650 | 380 | 675475 | 5527500 | 320 |
| 675450 | 5527800 | 420 | 675450 | 5527650 | 400 | 675450 | 5527500 | 400 |
| 675425 | 5527800 | 400 | 675425 | 5527650 | 400 | 675425 | 5527500 | 440 |
| 675400 | 5527800 | 360 | 675400 | 5527650 | 520 | 675400 | 5527500 | 460 |
| 675375 | 5527800 | 380 | 675375 | 5527650 | 500 | 675375 | 5527500 | 520 |
| 675350 | 5527800 | 440 | 675350 | 5527650 | 400 | 675350 | 5527500 | 540 |
| 675325 | 5527800 | 480 | 675325 | 5527650 | 480 | 675325 | 5527500 | 520 |
| 675300 | 5527800 | 480 | 675300 | 5527650 | 400 | 675300 | 5527500 | 700 |
| 675275 | 5527800 | 540 | 675275 | 5527650 | 600 | 675525 | 5527450 | 300 |
| 675250 | 5527800 | 540 | 675250 | 5527650 | 620 | 675500 | 5527450 | 500 |
| 675225 | 5527800 | 600 | 675225 | 5527650 | 700 | 675475 | 5527450 | 520 |
| 675200 | 5527800 | 660 | 675525 | 5527600 | 300 | 675450 | 5527450 | 360 |
| 675525 | 5527750 | 400 | 675500 | 5527600 | 320 | 675425 | 5527450 | 460 |
| 675500 | 5527750 | 400 | 675475 | 5527600 | 360 | 675400 | 5527450 | 460 |
| 675475 | 5527750 | 400 | 675450 | 5527600 | 420 | 675375 | 5527450 | 600 |
| 675450 | 5527750 | 300 | 675425 | 5527600 | 440 | 675350 | 5527450 | 520 |
| 675425 | 5527750 | 400 | 675400 | 5527600 | 400 | 675325 | 5527450 | 540 |
| 675400 | 5527750 | 380 | 675375 | 5527600 | 480 | 675300 | 5527450 | 680 |
| 675375 | 5527750 | 360 | 675350 | 5527600 | 500 | 675525 | 5527400 | 400 |
| 675350 | 5527750 | 480 | 675325 | 5527600 | 580 | 675500 | 5527400 | 460 |
| 675325 | 5527750 | 560 | 675300 | 5527600 | 620 | 675475 | 5527400 | 500 |
| 675300 | 5527750 | 540 | 675525 | 5527550 | 260 | 675450 | 5527400 | 380 |
| 675275 | 5527750 | 500 | 675500 | 5527550 | 300 | 675425 | 5527400 | 460 |
| 675250 | 5527750 | 520 | 675475 | 5527550 | 340 | 675400 | 5527400 | 600 |
| 675225 | 5527750 | 460 | 675450 | 5527550 | 420 | 675375 | 5527400 | 620 |
| 675200 | 5527750 | 620 | 675425 | 5527550 | 440 | 675375 | 5527400 | 540 |
| 675525 | 5527700 | 300 | 675400 | 5527550 | 420 | 675375 | 5527400 | 600 |
| 675500 | 5527700 | 360 | 675375 | 5527550 | 560 | | | |
| 675475 | 5527700 | 380 | 675350 | 5527550 | 520 | | | |
| 675450 | 5527700 | 420 | 675325 | 5527550 | 500 | | | |
| 675425 | 5527700 | 440 | 675300 | 5527550 | 600 | | | |
| 675400 | 5527700 | 360 | | | | | | |
| 675375 | 5527700 | 380 | | | | | | |
| 675350 | 5527700 | 420 | | | | | | |
| 675325 | 5527700 | 540 | | | | | | |
| 675300 | 5527700 | 500 | | | | | | |
| 675275 | 5527700 | 640 | | | | | | |
| 675250 | 5527700 | 620 | | | | | | |
| 675225 | 5527700 | 640 | | | | | | |