BRITISH COLUMBIA
The Best Place on Earth

**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:** $ 9,542.55

**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):** 5557831 June 15, 2015

**PROPERTY NAME:** Bertha

**CLAIM NAME(S) (on which the work was done):** 580997

**COMMODITIES SOUGHT:** Copper Gold

**MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:** 092INE009

**MINING DIVISION:** Kamloops **NTS/BCGS:** 092I.047 092I.056 092I.057

**LATITUDE:** 50 ° 29 ' 40 " **LONGITUDE:** 120 ° 44 ' 05 " **(at centre of work)**

**OWNER(S):**
1) Guy Delorme 2)

**MAILING ADDRESS:**
818-470 Granville Street
Vancouver BC V6C 1V5

**OPERATOR(S) [who paid for the work]:**
1) Christopher Delorme 2)

**MAILING ADDRESS:**
340 Logan Lane
Merritt BC V1K 1P7

**PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):**
Triassic-Jurassic, Granodiorites, Triassic, Nicola Group, Western Volcanic Facies, Volcanics, Guichon Creek Fault, Ford Past Producer, Chalcocite,Bornite, Malachite, Chlorite, Sericite, Clinozoisite, 0.22 to 2.8 per cent copper over less than one metre

**REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:** 04499 16189 29034 29495 32980 34738

Next Page

| 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** | 513 hectares | 580997 | $ 6,000.00 |
| **GEOPHYSICAL (line-kilometres)** | | | |
| **Ground** | | | |
| **Magnetic** | 2.0 | 580997 | 3,542,55 |
| **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:** | $ 9,542.55 |

# GUY & CHRISTOPHER DELORME

*(Owners & Operators)*

# ASSESSMENT REPORT

*on*

# GEOLOGICAL & GEOPHYSICAL SURVEYS

*(Event 5557831)*



*work done from*

**May15, 2015 to June 15, 2015**

*on*

**Tenure 580997**

*of the 10 claim*

**Bertha 580997 Claim Group**

**Kamloops Mining Divisions**

**BCGS Maps 092I.047/.056/.057**

*Centre of Work*
**5,596,065N, 660,675E**
*(Zone10 NAD83)*

*Author & Consultant*

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

*Submitted*
**February 28, 2016**

**TABLE OF CONTENTS**

***Table of Contents*** (cont'd)

**ILLUSTRATIONS**



**TABLES**



**APPENDICES**

## SUMMARY

The 4008 hectare Bertha 580997 Claim Group, located 215 kilometres northeast of Vancouver in the Highland Valley of south central British Columbia, is within 12 kilometres of the Highland Valley Copper mine, one of the largest copper mining and concentrating operations in the world.

The Highland Valley low-grade copper/molybdenum deposit lies within the Late Jurassic Guichon Creek batholith in Bethsaida phase porphyritic quartz monzonite and granodiorite. The most prominent structural features are the north trending, west dipping Lornex fault and the east trending Highland Valley fault. The cross-faulting relationship may have been the initiation to the formation of the mineral resource in that a mineralization conduit was provided. The reactivation of the Lornex fault created a progressively expansive structural system to accommodate the mineralization.

In the structural analysis of Tenure 580997, the one cross-structural location determined between a northerly and a northwesterly indicated primary major structure as indicated on Figures 5 and 7, could thus be a comparable zone of increased fractural intensity and/or localized breccias to create a conduit for, and a depository for potential mineralizing fluids.

Although the 11 claims of the Bertha 580997 Claim Group and specifically the structurally analyzed Tenure 580997 claim, are underlain by volcanics of the Nicola Group, not the preferred host to mineral deposits (except for the limestone units and fractured zones adjacent to mineralized porphyritic intrusives), smaller intrusives occurring as satellitic stocks of the Guichon Batholith outcrop on the Property, such as at the SA mineral showing, may be the primary mineral host. These stocks can be surface indicators of intrusive related porphyry mineralization at depth.

Some of the Minfile of mineral showings described herein hosted by the volcanics are related to zones of increased fracturing and could be indicative of proximal major cross-structural zones. Other Minfile mineral zones relate to limestone units or limy horizons within the volcanics and are potential Craigmont skarn mineral deposits.

An example of more definitive surficial geological indicators on the Bertha 580997 Claim Group from a source at depth is at one of the three Minfile descriptions on the Property: the Rhyolite mineral showing is reported as porphyry mineralization related to a basalt host and a shear zone trending at 335 to 345 degrees, (comparable trend to two of the indicated primary structures on the structurally analyzed Tenure 580997 – Figure 5). Mineralization at the Bertha Molly past producer is also structurally controlled with an apparent north trend.

The results of the magnetometer survey, which was within a volcanic area and positioned over cross-structure "A", indicated a 450 metre wide zone of intermittent localized relative mag LO's which can be dynamic and/or hydrothermal created alteration zones,

Even though the mag differential values are relatively low, this en-echelon zone of indicated possible hydrothermal alteration should be explored for geological indications of a deep seated porphyry mineral resource. The geological evidence, amongst more direct indicators, may be indicated by pathfinder elements and/or hydrothermal alteration products.

Excluding other variable geological conditions, the structures are essential in the localization of potentially economic porphyry and/or quartz vein hosted mineralization within related intrusives to the Guichon Creek Batholith and/or the host units of the Nicola Group.

## INTRODUCTION

In May & June 2015 a structural analysis and a localized magnetometer survey were completed on Tenure 580997 of the 10 claim Bertha 580997 claim group (Property). The purpose of the program was to delineate potential structures which may be integral in geological controls to potentially economic mineral zones that may occur on Tenure 580997 or other claims of the Property and to determine the effectiveness of the magnetic results in locating 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 & DESCRIPTION

### Location

The Bertha 580997 Claim Group is located within BCGS Maps 092I.047/.056/.057 of the Kamloops Mining Division, 215 kilometres northeast of Vancouver, 41 kilometres north of Merritt, 37 kilometres southwest of Kamloops, and within 12 kilometres east of the world-class producing Highland Valley Copper (*Minfile 092ISW012)* mine.

### Description

The Property is comprised of 10 contiguous claims covering an area of 4008.8384 hectares. Particulars are as follows:

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

*Table I.* **Tenures of Bertha 580997 Claim Group**

| Tenure Number | Type | Claim Name | Good Until | Area (ha) |
|---|---|---|---|---|
| 570172 | Mineral | | 20160509 | 20.5609 |
| 580984 | Mineral | LOGAN | 20160421 | 431.502 |
| 580992 | Mineral | LOGAN | 20160509 | 410.9436 |
| 580997 | Mineral | LOGAN | 20160509 | 513.9286 |
| 580998 | Mineral | | 20160509 | 472.9771 |
| 585374 | Mineral | | 20160509 | 514.1139 |
| 585375 | Mineral | | 20160509 | 514.2697 |
| 611543 | Mineral | LOGAN NORTH 10 | 20160509 | 513.7033 |
| 611583 | Mineral | LOGAN 1 | 20160509 | 431.6826 |
| 679148 | Mineral | | 20160509 | 185.1567 |

*Upon the approval of the assessment work filing, Event Number 5557831.

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

### Access

From Logan Lake, the Bertha 580997 claim group can be accessed by traveling from Logan Lake east on Highway 97D for two kilometres to the western boundary of Tenure 611583. Access on the Property is provided by numerous secondary roads.

### Climate

The local climate is typical of south central British Columbia. Annual temperatures range from 35$^{o}$C to -40$^{o}$C. Negative temperatures can be typically expected between late October and late March. Annual precipitation ranges around an average of 30 cm.

### Local Resources & 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. Logan Lake, where many of the Highland Valley Copper Mine employees reside, has many facilities to accommodate any preliminary exploration crew.

### Physiography

The Property is located within the Thompson Plateau of Southern British Columbia. Topography on Tenure 580997 is gentle to moderate, with elevations ranging between 1,168m in the northwest to 1,406 on a knoll in the northeast.

## WATER & POWER

There would be an ample water supply for the needs of any exploration program from the many lakes, rivers, or streams within the confines of the Property.

A 550 KV power line is adjacent to the southwest corner of the Tenure 580997.

## HISTORY: PROPERTY AREA

The history on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers peripheral to the Bertha 580997 Claim Group is reported as follows. The distance to the Minfile locations is relative to Tenure 580997 of the Bertha 580997 Claim Group.

***BETHLEHEM (EAST JERSEY)*** past producer (Porphyry Cu +/- Mo +/- Au)
MINFILE 092ISE002
Eleven kilometres west

*The East Jersey pit was mined from 1962 until 1965, when the pit wall failed. See Bethlehem mine (092ISE001) for production statistics.*

***HIGHLAND VALLEY COPPER*** producer (Porphyry Cu+/-Mo+-Au)
MINFILE 092ISW012
Twelve kilometres west

*Highland Valley Copper was created in mid-1986 by bringing together the Highland Valley mining operations of Lornex Mining Corporation Ltd. and Cominco Ltd. into a new single entity, structured as a partnership.*

*On the south side of the valley was the Lornex mine which started mining in 1972. In 1981, the Lornex concentrator had been expanded to become one of the largest in the industry.*

*On the north side was Bethlehem Copper (092ISE001) which started mining in 1963. In 1981, this operation was absorbed by Cominco who already owned the Valley orebody (092ISW012) located west of the Lornex pit on the south side of the valley. Mining of the original Bethlehem Copper pits ceased in 1982.*

*Production from the Lornex mine (092ISW045) was combined with the Valley operations in 1987.*

*The Highmont mill on the south side of the valley was acquired in 1988 when Highmont Mining Company joined the partnership. This mill had been closed down in 1984 when the Highmont deposit (092ISE013) became uneconomical.*

*Lornex Mining Corporation Ltd. was wound up at the end of 1988 with the result that Rio Algom Limited, Teck Corporation and Highmont Mining Company obtained direct participation in the cash flow from the partnership.*

*In 1995, with Explore B.C. Program support, Highland Valley Copper carried out 197 line kilometres of high-powered induced polarization surveys for very deep penetration, and drilled 1701 metres in 4 holes. This work was done on the Lornex SW Extension, Roscoe Lake and JA zones. No anomalies of merit were detected in Lornex SW Extension, and Roscoe Lake gave only limited encouragement. IP work on the JA zone detected an anomaly extending to the south, well beyond the limits of known mineralization, and another anomaly 2000 by 1500 metres in size at the east end of the grid. Both anomalies warrant drill testing (Explore B.C. Program 95/96 - M80).*

*At the end of 1996, mine plans called for another 200 metres in depth in the Valley pit to the 2008. In addition, the partnership may consider mining the remaining 120 million tonnes grading 0.33 per cent copper estimated to exist in the Lornex pit (Information Circular 1997-1, page 8).*

*Highland Valley Copper suspended mining on May 15, 1999; they resumed August 30, 1999.*

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

***Highland Valley Copper*** *producer (cont'd)*

*In September 2005, Highland Valley announced that mine life would be extended by five years to 2013. Very late in the year, Teck Cominco also announced that it is considering building a modern hydrometallurgical refinery on site.*

*Most ore comes from the Valley pit, augmented by a small amount from the Lornex pit. Following a successful 300,000 tonne bulk sample test, the Highmont East pit, closed since the mid-1980s, was re-opened in the fall of 2005 to take advantage of higher molybdenum prices. In addition, exploration drilling was conducted nearby in the Highmont South area and results are being evaluated.*

***BERTHA - MOLLY*** past producer (Stockwork)
MINFILE 092ISE012
Two kilometres south

*In 1942, George Campbell did some surface-stripping on a copper showing, about 457 metres west of an old shaft. Production from this occurrence, known as the Lost group, was 31 tonnes, yielding 218 grams of silver and 626 kilograms of copper.*

***RHYOLITE*** showing (Porphyry Cu +/- Mo +/- Au)
MINFILE 092ISE021
100 metres south

*Trenches, 1.25 kilometres north-northwest of Homfray Lake, 8.5 kilometres south-southeast from Logan Lake (Assessment Report 18048).*

***PLUG*** showing *(*Volcanogenic)
MINFILE 092ISE196
Two kilometres southeast

*Plug occurrence is located on the southern side of Meadow Creek, approximately 13 kilometres southeast of the community of Logan Lake.*

*Between 1986 and 1988, Western Resources Technologies completed programs of geological mapping, prospecting, soil geochemical sampling and geophysical (VLF-EM and magnetometer) surveys. A grab sample of carbonate altered rock from the west- central zone along Meadow Creek assayed 7.5 grams per tonne gold and 67.5 grams per tonne silver (Assessment Report 18048). In 1992, G.F. Crooker completed a program of magnetometer and VLF-EM surveys on the JB claims.*

*In 1995, Goldcliff Resource acquired the property as the S 1 to 48 claims and between then and 2006 they completed programs of prospecting, geochemical sampling, geophysical surveys, trenching and drilling.*

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

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

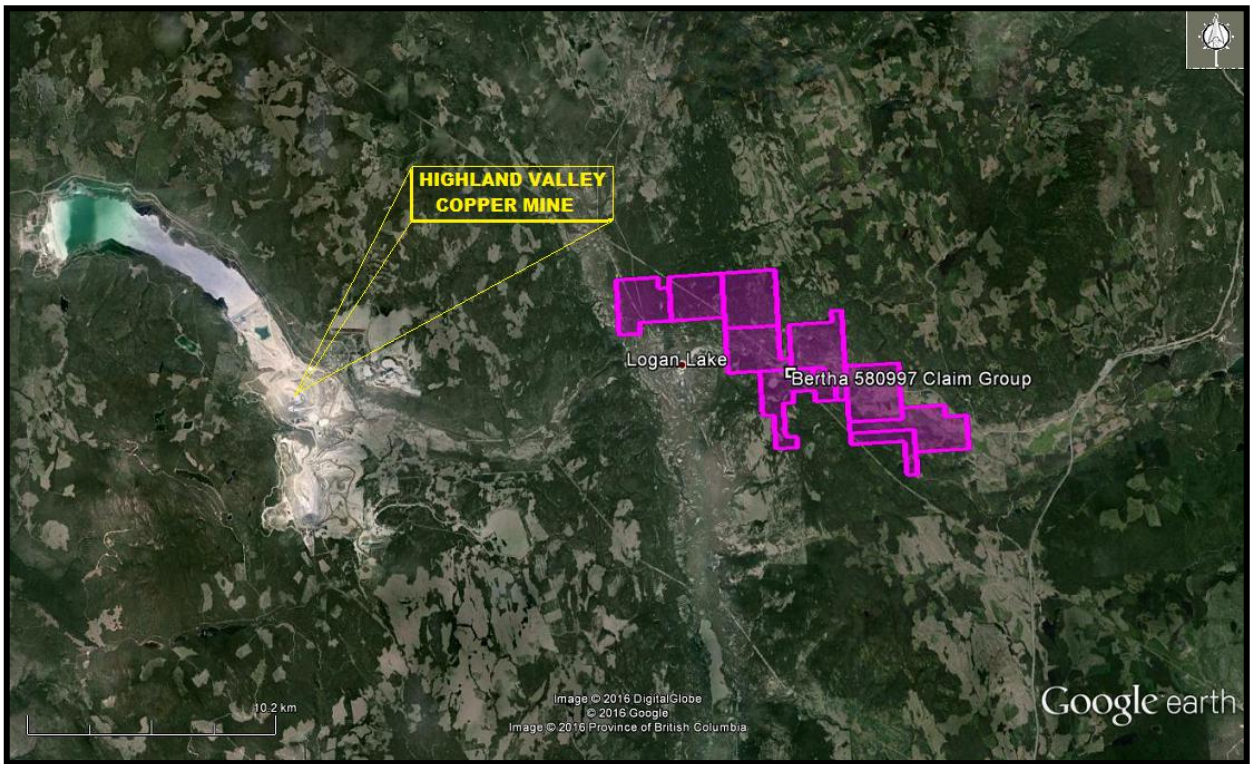
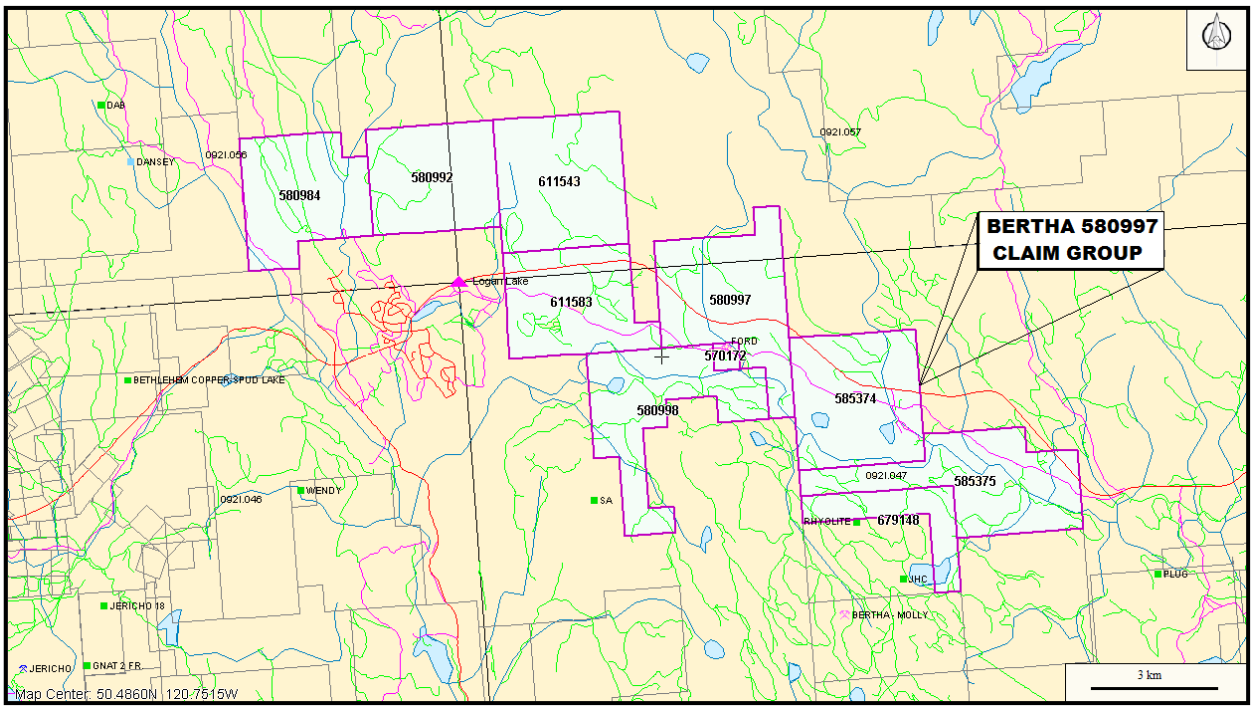



*Figure 3.* **Claim Map**
*(from Google Earth)*



## GEOLOGY: REGIONAL

The Bertha 580997 Claim Group is located on the southern Intermontane Belt of British Columbia on the southern extent of the Quesnel Trench. The central geological features of this region are the Late Triassic island-arc volcanic rocks of the Nicola Group, and Late Triassic mudstone, siltstone and shale clastic sedimentary rocks located to the east, and intrusive granodioritic rocks of the Late Triassic to early Jurassic. The Nicola Group is a succession of Late Triassic island-arc volcanic rocks. The Nicola Group volcanic rocks form part of a 30km to 60km wide northwest-trending belt extending from southern B.C. into the southern Yukon. This belt is enclosed by older rocks and intruded by batholiths and smaller intrusive rocks. Major batholiths in the area of the Logan Copper Property include the Guichon Creek Batholith to the west, the Wild Horse Batholith to the east, and the Iron Mask Batholith to the north northeast.

The Guichon Creek batholith is a large, composite intrusion with a surface area of about 1,000 square kilometers. A cluster of nine major porphyry copper deposits lie within a 15 square kilometer zone in the center of the batholith. The Bertha 580997 Claim Group is situated on the eastern contact of the Guichon Creek Batholith and the Nicola volcanics within 12 kilometres of the Highland Valley Copper Mine.

The batholith is a semi-concordant composite intrusive that is elliptical and elongated slightly west of north. A central, steeply plunging root or feeder zone is inferred under Highland Valley, and the major deposits lie around the projection of the feeder zone to the surface. The batholith has intruded and metamorphosed island-arc volcanic and associated sedimentary rocks of the Nicola Group, and a metamorphic halo up to 500 meters wide is developed adjacent to the contact. Rocks along the edge of the batholith are older and more mafic, and successive phases moving inward toward the core are younger and more felsic.

Although contacts can be sharp, they are generally gradational and chilled contacts are not common. Variations in the batholiths geochemistry indicate local areas of assimilated country rock in the border zone and roof pendants in the intrusion. Outcrop areas have inclusions of amphibolite and “granitized” metamorphic rocks and compositional variations.

Two younger volcanic-dominated successions are important in the area. First, a northwest trending belt of Cretaceous continental volcanic and sedimentary rocks of the Spences Bridge Group unconformably overlie both the Nicola Group country rock and intrusive rocks along the southwest flank of the batholith. Distribution of the Spences Bridge Group rocks was locally controlled by reactivation of older faults that were important mineralization conduits in the batholith, such as the Lornex fault. Second, continental volcanic and sedimentary rocks of the Tertiary Kamloops Group cover extensive areas of the batholith and also overlie Triassic and Jurassic rocks from north of Highland Valley to the Thompson River. These also form isolated outliers and local intrusive centers south of the Highland Valley

## GEOLOGY: PROPERTY AREA

The geology of some of the more significant mineral MINFILE reported occurrences, prospects, and past producers peripheral to the Bertha 580997 Claim Group is reported as follows. The distance to the Minfile locations is relative to Tenure 580997 of the Bertha 580997 Claim Group.

***BETHLEHEM (EAST JERSEY)*** past producer (Porphyry Cu +/- Mo +/- Au)
MINFILE 092ISE002
Eleven kilometres west

***Geology: Property Area****(cont'd)*
***Bethlehem (East Jersey)*** *past producer (cont'd)*

*The property lies within the Early Jurassic-Late Triassic Guichon Creek batholith and straddles an intrusive contact where younger Bethlehem phase quartz diorite to granodiorite forms an irregular embayment in older Guichon variety granodiorite. Igneous breccias are believed to have been forcefully emplaced. The granodiorites and breccias are intruded by north trending swarms of dacite porphyry dykes which dip steeply and are up to 60 metres wide.*

*The Bethlehem (East Jersey) deposit is partly controlled by faults and is localized in breccia bodies and intensely fractured zones. Potassic, phyllic and propylitic alteration are confined to areas of ore concentration. Alteration minerals include biotite, sericite, kaolinite, epidote and chlorite and are typically zoned.*

*Quartz, calcite and zeolite (laumontite) veining and vug-filling is common. The principal ore minerals are molybdenite, bornite and chalcopyrite and occur with numerous supergene copper minerals and copper oxides. An age date from a sample of a mixture of magmatic and hydrothermal biotite from the Iona ore zone (092ISE006) returned 199 Ma +/- 8 Ma*

***HIGHLAND VALLEY COPPER*** producer (Porphyry Cu+/-Mo+-Au)
MINFILE 092ISW012
Twelve kilometres west

*The Valley deposit lies within the Late Triassic to Early Jurassic Guichon Creek batholith and is hosted by Bethsaida phase porphyritic quartz monzonite and granodiorite. Feldspar porphyry and quartz feldspar porphyry dykes 0.6 to 35 metres wide dip steeply eastward in the western and central areas, and northward in the southern area of the deposit. These dykes are cut by mineralized fractures and quartz veinlets, and have been dated at 204 Ma +/- 4 Ma.*

*The Bethsaida granodiorite is also intruded by aplite dykes up to 30 centimetres wide, tan-coloured felsite dykes up to 4.5 metres wide, and three types of lamprophyre dykes (spessartite, hornblende vogesite, vogesite).*

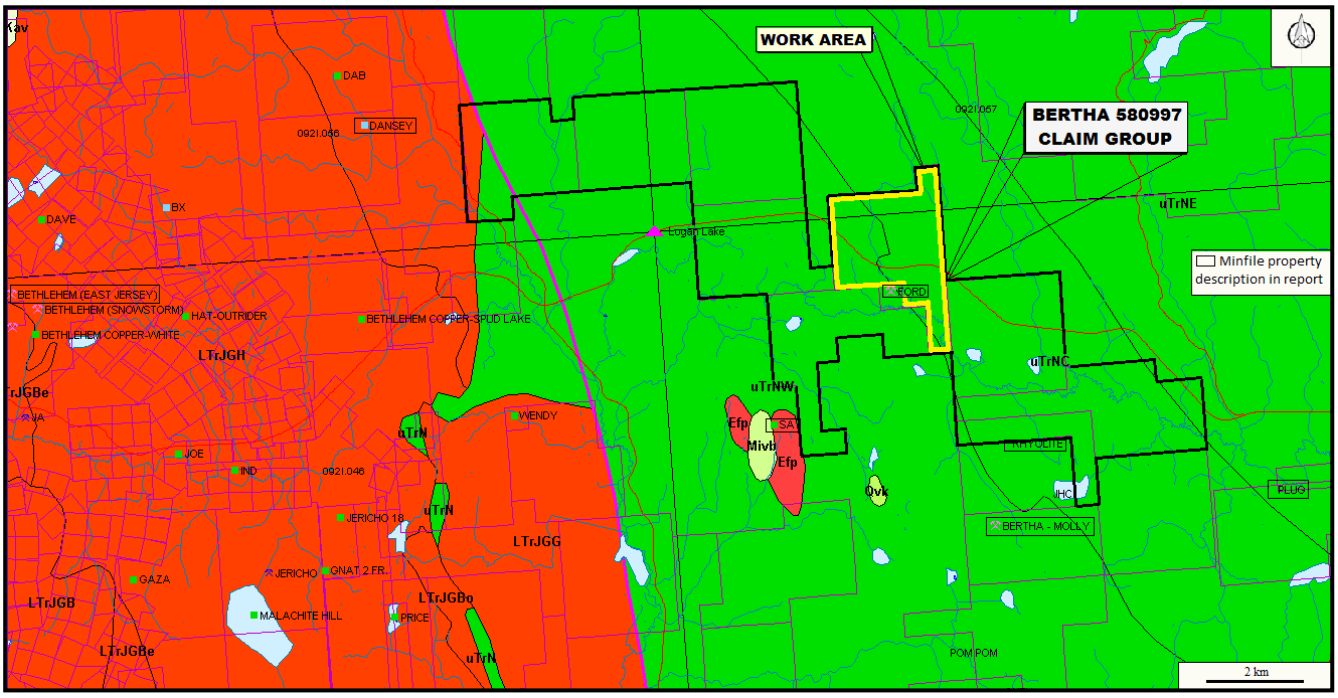
*The most prominent structural features are the north trending, west dipping Lornex fault and the east trending Highland Valley fault. Faults and fractures in the deposit comprise four main sets. Quartz veinlets are subparallel to two of the earlier formed fault and fracture sets. These veinlets are moderately abundant within the 0.3 per cent copper isopleth. An area of well-developed barren quartz veinlets, generally 0.5 to 1.3 millimetres wide, without alteration envelopes, occurs in the southeastern part of the deposit.*

*In the west-central part of the deposit, potassium feldspar is associated with vein sericite in some replacement zones, as veinlet envelopes along fractures, and disseminated in quartz veinlets. Hydrothermal biotite occurs in small amounts. Flaky sericite and quartz, both as replacement zones and as envelopes around quartz veinlets, constitute the most common type of alteration associated with copper mineralization.*

*Strong phyllic alteration coincides with the 0.5 per cent copper isopleth. Phyllic alteration is closely associated with pervasive argillization, which is strongest where fractures are most closely-spaced. Feldspars are altered to sericite, kaolinite, quartz and calcite. The phyllic-argillic zone grades outward to a peripheral zone of weak to moderate propylitization, characterized by clay, sericite, epidote, clinozoisite and calcite replacing plagioclase, and chlorite and epidote replacing biotite.*

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

*Figure 4.* **Geology, Claim, Index & Minfile**
*(Base Map from MapPlace)*




## GEOLOGY MAP LEGEND

**Mivb**
Miocene-unnamed
Basaltic volcanic rocks
**EKav**
Eocene-Kamloops Group
Undivided volcanic rocks
**EPrb**
Eocene-Penticton Group
Andesitic volcanic rocks
**Upper Triassic-Nicola Group**
**uTrNc**
Central Volcanic Facies
undivided volcanic rocks
**uTrN**
undivided volcanic rocks

**Late Triassic to Early Jurassic**
**LTrJGB**
GUICHON CREEK BATHOLITH
**LTrJGBe** – Bethlehem Phase
granodioritic intrusive rocks
**LTrJGB** – Bethsaida Phase
quartz monzonitic intrusive rocks
**LTrJGH** – Highland Valley Phase
granodioritic intrusive rocks
**LTrJGG** – Gump Lake Phase
granodioritic intrusive rocks
**LTrJGBo** – Border Phase
quartz dioritic intrusive rocks

***Geology: Property Area****(cont'd)*
***Highland Valley Copper*** *producer (cont'd)*

*The age of hydrothermal alteration is approximately 191 Ma.*

*At the Valley deposit, gypsum is interpreted to be secondary and post-ore. It is commonly fibrous and white to orange but locally it forms large platy crystals or may be massive. Anhydrite, which is also present, provides indirect evidence for the secondary nature of the gypsum. It is apparently the same age as and associated with sericitic and potassic alteration. Quartz-gypsum veins and quartz-potash feldspar veins in which gypsum fills interstices provide more direct evidence for its secondary nature. Gypsum is believed to have formed at the expense of anhydrite which was deposited from the ore-forming fluids. Gypsum veins are common in the lower portion of the orebody (Open File 1991-15).*

*Sulphides occur chiefly as disseminations in quartz veinlets, and in phyllic (bornite) and potassic (chalcopyrite) alteration zones. Mineralization includes bornite and chalcopyrite, with minor digenite, covellite, pyrite, pyrrhotite, molybdenite, sphalerite and galena. The oxide zone averages 4.5 metres in thickness, and contains limonite, malachite, pyrolusite, digenite, native copper, and tenorite(?).*

***BERTHA - MOLLY*** past producer (Stockwork)
MINFILE 092ISE012
Two kilometres south

*The Dupont Lake area is underlain mainly by Upper Triassic Nicola Group intermediate volcanics and derivatives. Approximately 8 kilometres to the west, Nicola Group rocks are in contact with the Lower Jurassic Guichon Creek batholith. Quartz diorite outcrops southwest of Dupont Lake.*

*The Bertha-Molly showing is hosted by purplish amygdaloidal andesites with intercalated reddish tuffs. These rocks are strongly fractured and chloritized. The original shaft was sunk at a point where patches of cuprite occur in fractures. Small shipments were made.*

***RHYOLITE*** showing (Porphyry Cu +/- Mo +/- Au)
MINFILE 092ISE021
100 metres south

*The area straddles a northwest trending contact between two volcanic sequences of the Upper Triassic Nicola Group. To the west are plagioclase, plagioclase-augite intermediate pyroclastic and epiclastic breccia, conglomerate, tuff, sandstone, local shale and augite porphyry bodies. The central portion to the east is underlain by aphanitic pillowed mafic flows. The contact between these two sequences hosts the Rhyolite occurrence.*

*The Rhyolite showing is underlain by grey, green or black amygdaloidal basalt of the Upper Triassic Nicola Group. Varicoloured calcite amygdules occur within an aphanitic groundmass. Several beds of maroon to green volcaniclastic breccia occur within the basalt and contain maroon, subrounded to subangular clasts ranging up to 30 by 15 centimetres. Two northwest trending, light grey-green, aphanitic, siliceous and pyritic felsic dykes, 3 to 4 metres wide, also occur.*

***SA*** showing (Stockwork, Disseminated)
MINFILE 092ISE167
500 metres west

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

***SA*** *showing (cont'd)*

*The property lies within the Upper Triassic Nicola Group approximately 3 kilometres east of the Lower Jurassic Guichon Creek batholith. Locally Tertiary volcanic flows and minor intrusives overlie the Triassic rocks.*

*The area is underlain by a conformable succession of epiclastic rocks with subordinate interlayered lavas. The sedimentary sequence is best exposed at the main showing where the succession is about 90 metres thick. This unit is comprised of 50 to 100 metres of volcanic conglomerate composed of subangular to rounded red to green clasts of flow rocks cemented by a friable sandy matrix. Weakly bedded, coarse-grained fossiliferous limestone overlies the conglomerate and is again overlain by at least 60 metres of conglomerate grading upward into massive volcanic breccia. An upper unit of poorly bedded, well sorted greywacke caps the succession. Amygdaloidal basalt and andesite outcrop to the east and south where they are interlayered with the epiclastic rocks. Vesicles are filled with carbonate, zeolite and chalcocite.*

***PLUG*** showing *(*Volcanogenic)
MINFILE 092ISE196
Two kilometres southeast

*The area is underlain by volcanic rocks of the Upper Triassic Nicola Group that are cut by small granitic plugs and sills. Sparse outcroppings of Nicola Group rocks along Meadow Creek consist of altered andesite, lapilli tuff, amygdaloidal basalt and minor lenses of limy sediments that strike east to southeast and dip steeply to the north. Alteration minerals include chlorite, epidote, carbonate and hematite. A quartz-mariposite-carbonate rock outcrops along Meadow Creek and is in contact with a chlorite-mica-feldspar schist that strikes 20 degrees and dips 65 to 90 degrees to the east. The schist and mafic dioritic to hornblende andesite sills form a southeastward plunging asymmetrical syncline.*

*The quartz mariposite carbonate rock contains minor amounts of silver-bearing galena, sphalerite and chalcopyrite. An outcrop of highly pyritic quartz feldspar porphyry contains minor amounts of chalcopyrite.*

## GEOLOGY: PROPERTY

The Bertha 580997 is shown to be predominantly underlain by volcanics of the Nicola Group, not the preferred host to mineral deposits (except for the limestone units and fractured zones adjacent to mineralized porphyritic intrusives), smaller intrusives occurring as satellitic stocks of the Guichon Batholith outcrop on the Property which may be the primary mineral host. These stocks can be surface indicators of intrusive related mineralization at depth.

***FORD*** past producer *(*Volcanogenic)
MINFILE 092ISE009
Within Tenure 570172

*The Ford occurrence occupies the area north of Meadow Creek, which is underlain by dark grey to purplish red porphyritic amygdaloidal flows of the Upper Triassic Nicola Group. The lavas are typically amygdaloidal and vary in composition from olivine basalt to augite andesitic basalt.*

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

***Ford*** *past producer (cont'd)*

*Alteration consists of albitization of plagioclase and propylitization of pyroxene to epidote, zoisite and calcite, with or without chlorite. The rock is locally shot through with sericite and epidote. Flows averaging 1.8 metres thick strike 050 degrees and dip 30 degrees northeast.*

## MINERALIZATION: PROPERTY AREA

The mineralization on some of the more significant mineral MINFILE reported occurrences, prospects, and past producers peripheral to the Bertha 580997 Claim Group is reported as follows. The distance to the Minfile locations is relative to Tenure 580997 of the Bertha 580997 Claim Group.

***BETHLEHEM (EAST JERSEY)*** past producer (Porphyry Cu +/- Mo +/- Au)
MINFILE 092ISE002
Eleven kilometres west

*Reserves for the East Jersey are 20.6 million tonnes of 0.40 per cent copper (CIM Special Volume 46, page 175).*

***HIGHLAND VALLEY COPPER*** producer (Porphyry Cu+/-Mo+-Au)
MINFILE 092ISW012
Twelve kilometres west

*Highland Valley Copper operates two distinct mines, the Valley mine and the Lornex mine, and between the two has measured and indicated ore reserves of 761 million tonnes of 0.408 per cent copper and 0.0072 molybdenum. The ore reserves of each mine are: Valley mine - 627 million tonnes at 0.418 per cent copper and 0.0056 per cent molybdenum; Lornex mine - 135 million tonnes at 0.364 per cent copper and 0.0144 per cent molybdenum. The individual mine reserves are calculated at an equivalent cutoff grade of 0.25 per cent copper using a molybdenum multiplying factor of 3.5 (CIM Bulletin July/August 1992, pages 73,74).*

***BERTHA - MOLLY*** past producer (Stockwork)
MINFILE 092ISE012
Two kilometres south

*Recent development has exposed malachite, azurite, chalcopyrite, cuprite and pyrite hosted by shears and fracture-fillings in vesicular volcanics and red tuffs. Mineralization is structurally controlled with an apparent north trend. A common alteration is calcite and epidote with silicification becoming stronger at depth.*

***RHYOLITE*** showing (Porphyry Cu +/- Mo +/- Au)
MINFILE 092ISE021
100 metres south

*Mineralization occurs in amygdaloidal basalt near the flow-volcaniclastic contact and is related to narrow quartz-carbonate veinlets within shears. Several old trenches indicate the shear zone strikes approximately 335 to 345 degrees and dips steeply west. Pyrite is present with minor chalcopyrite, azurite, malachite and sphalerite. Rock samples from this zone assayed up to 0.377 per cent copper, 0.218 per cent zinc and are weakly anomalous in gold and silver values.*

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

***SA*** *showing (Stockwork, Disseminated)*
MINFILE 092ISE167
500 metres west

*On the SA showing, highly fractured, malachite stained, rusty weathering limestone(?) is exposed for 45.7 metres along the east side of an old logging access road. Stringers and disseminated grains of chalcocite, bornite and rarely chalcopyrite are visible on freshly broken surfaces. Much of the rock is strongly oxidized to a soft, rusty gossan locally rich in malachite.*

***PLUG*** showing *(*Volcanogenic)
MINFILE 092ISE196
Two kilometres southeast

*The quartz mariposite carbonate rock contains minor amounts of silver-bearing galena, sphalerite and chalcopyrite. An outcrop of highly pyritic quartz feldspar porphyry contains minor amounts of chalcopyrite.*

## MINERALIZATION: PROPERTY

The mineralization on the mineral MINFILE reported occurrences, prospects, and past producers within the Bertha 580997 Claim Group is reported as follows

***FORD*** past producer *(*Volcanogenic)
MINFILE 092ISE009
Within Tenure 570172

*The original open cuts (pre-1915) expose copper carbonate ore with occasional flecks of bornite and chalcocite along fracture planes in amygdaloidal flows. The adit follows a mineralized shear zone striking 040 degrees and intersects an east trending set of faults.*

*Chalcocite(?), bornite and some malachite occur in amygdules and associated veins in flow tops. Gangue minerals include chlorite, sericite, clinozoisite, zeolite and calcite. Some mineralization also occurs in calcite veins, calcite-epidote-sericite veins, sericite-zoisite veins and chlorite veins. Carbonate-zeolite veins are barren.*

*Drill core assays range from 0.22 to 2.8 per cent copper over an interval of less than one metre (Minister of Mines Annual Report 1973).*

## STRUCTURAL ANALYSIS

The structural analysis was performed on a DEM image hillshade map of Tenure 580997 by viewing of the map and marking the lineaments as indicated structures thereon. A total of 37 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 on Tenure 580997 is at 5,594,290N, 662,870E (10) (NAD 83).

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

*Figure 5.* **Indicated Lineaments on Tenure 580997**

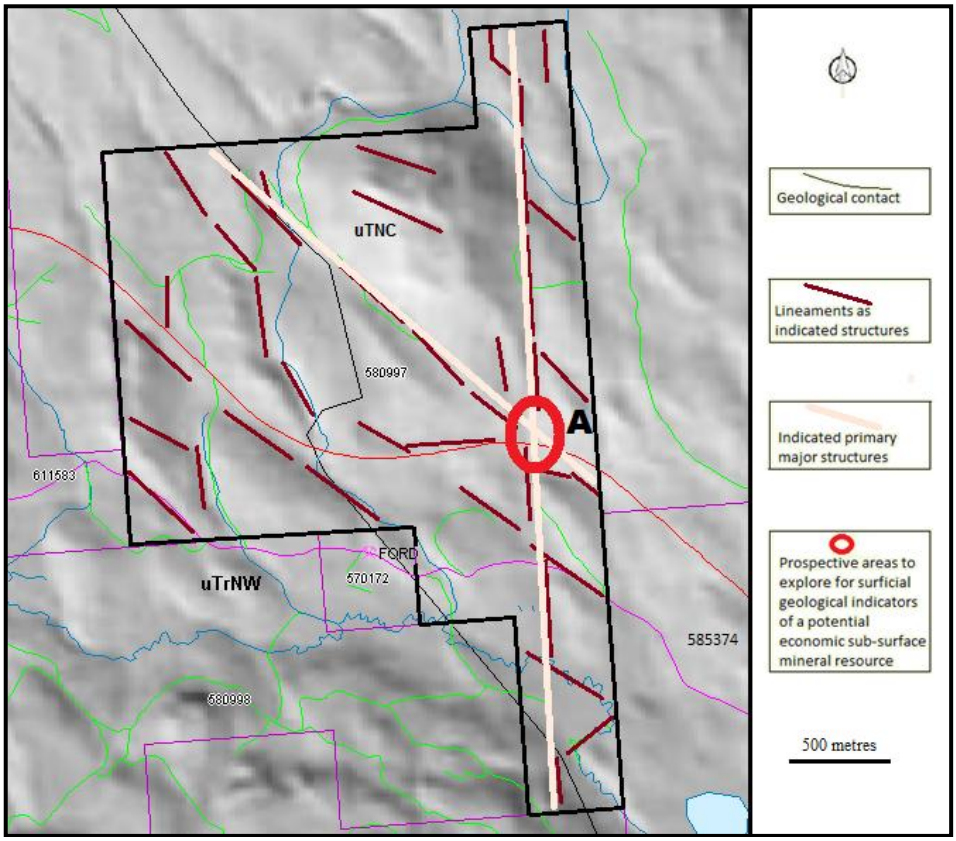
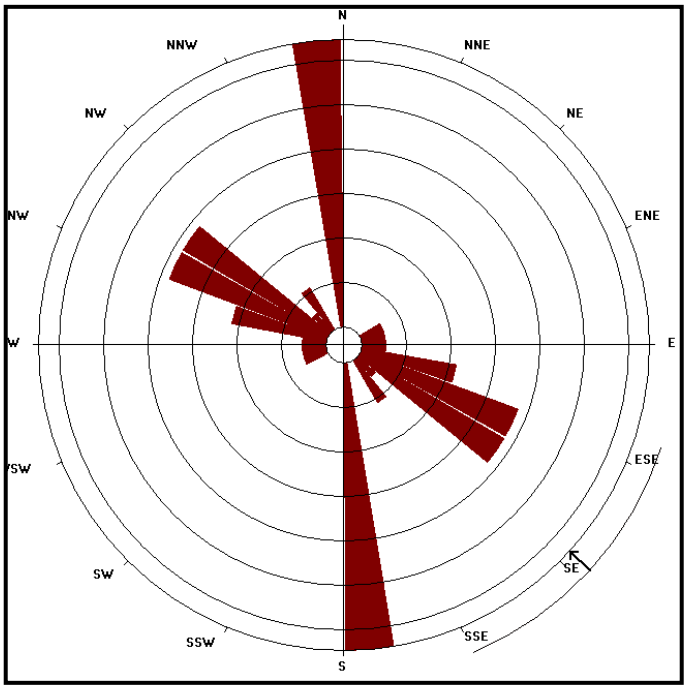



*Figure 6.* **Rose Diagram from lineaments of Tenure 580997**



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

# STATISTICS

Axial (non-polar) data
No. of Data = 37
Sector angle = 10°
Scale: tick interval = 5% [1.9 data]
Maximum = 32.4% [12 data]
Mean Resultant dir'n = 132-312
[Approx. 95% Confidence interval = ±24.5°]
(valid only for unimodal data)

_____

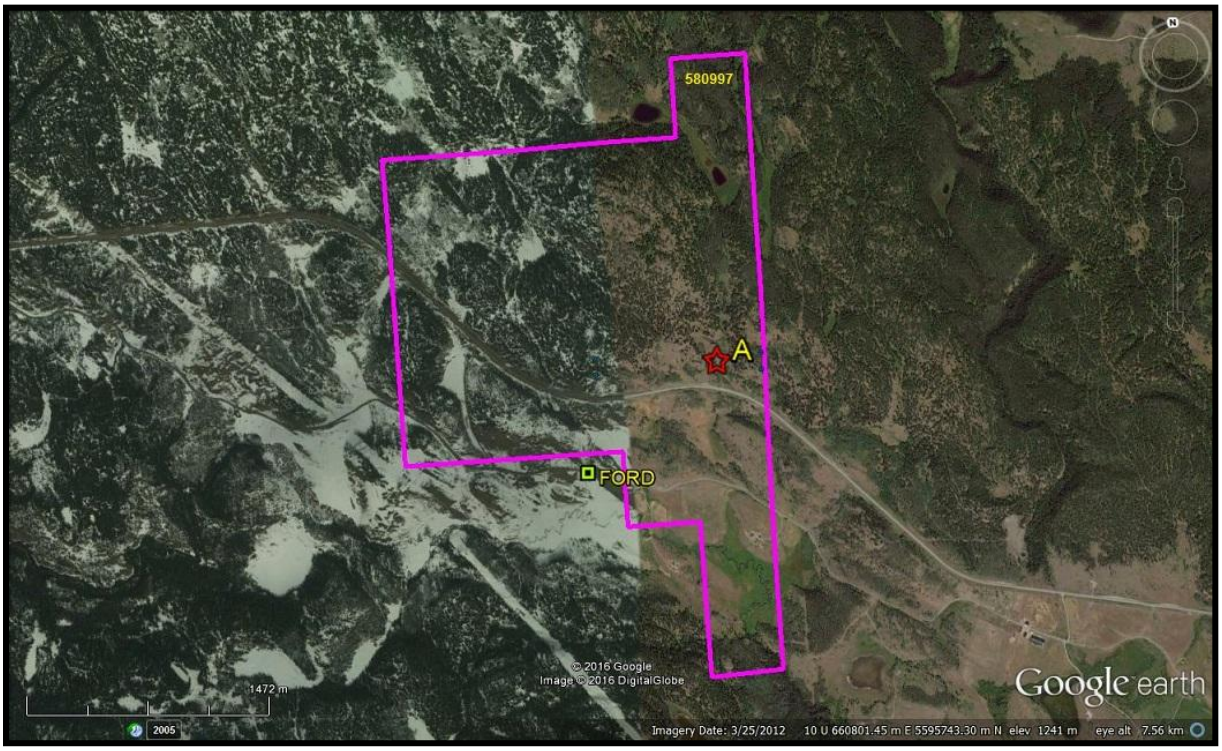
Mean Resultant dir'n = 132.5 - 312.5
Circ.Median = 124.0 - 304.0
Circ.Mean Dev.about median = 27.1°
Circ. Variance = 0.17
Circular Std.Dev. = 35.26°
Circ. Dispersion = 1.66
Circ.Std Error = 0.2117
Circ.Skewness = -3.12
Circ.Kurtosis = -20.88
kappa = 1.06
(von Mises concentration param. estimate)

Resultant length = 17.35
Mean Resultant length = 0.4689

'Mean' Moments: Cbar = -0.0413; Sbar = -0.4671
'Full' trig. sums: SumCos = -1.5299; Sbar = -17.2829
Mean resultant of doubled angles = 0.2704
Mean direction of doubled angles = 023

(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 structural location on Google Earth**
*(Base Map: Google Earth)*



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

*Table II.* **Approximate UTM locations of cross-structure**
*(UTM-NAD 83)*

| Location | UTM East | UTM North | Elevation |
|---|---|---|---|
| **A** | 661,437 | 5,595,813 | 1,263 |
| **FORD** *(Minfile)* | 660,635 | 5,595,161 | 1,172 |

## Magnetometer Survey

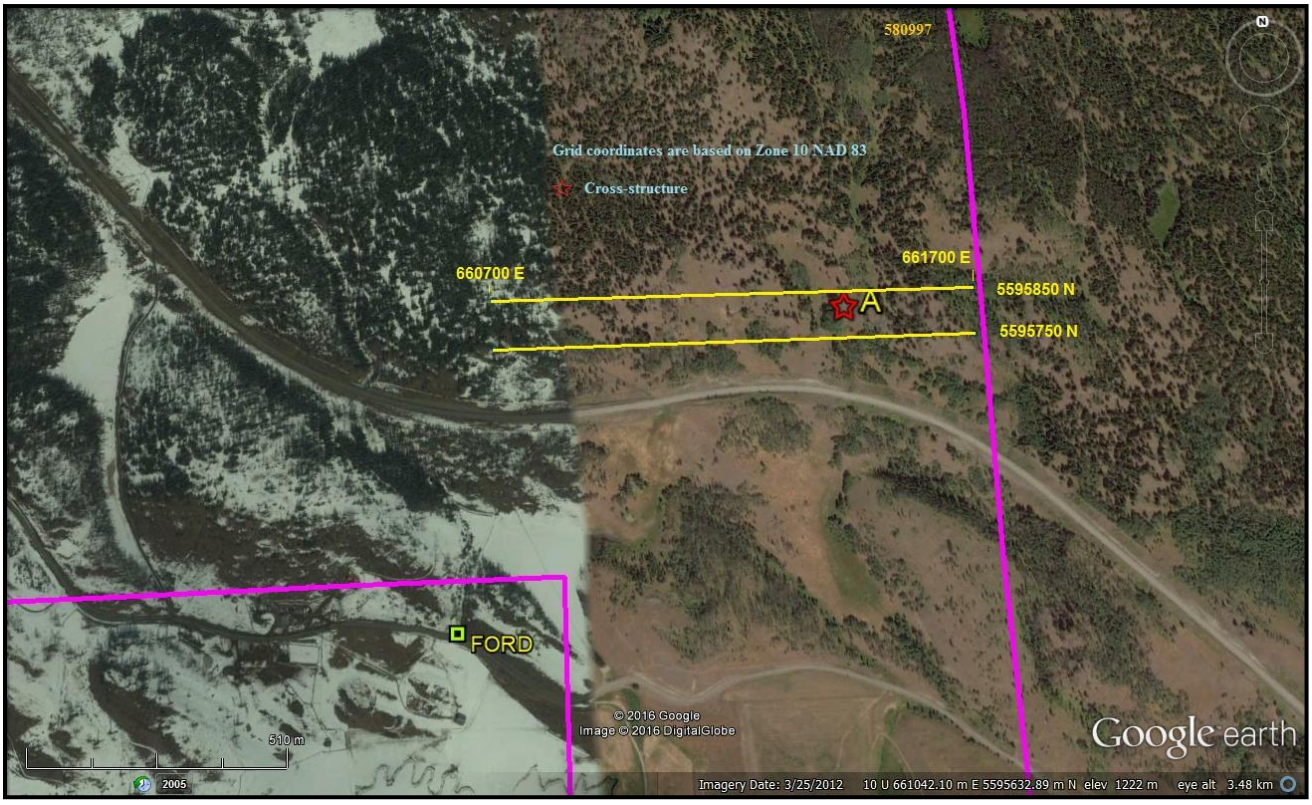
### a) Instrumentation

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 Survey Grid Index Map**
*(Base map from Google Earth)*




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

**c) Survey Procedure**

From an initial grid station 5595750N 661700 E a base line was established northerly to 5595850N. Magnetometer readings were taken at 25 metre intervals westerly along each of the two grid lines to 690700E. The grid line stations were located with a GPS instrument. Line kilometres of magnetometer survey completed was 2.0. The field data is reported herein in Appendix I.

*Figure 9* .**Magnetometer Survey Grid & Raw Data**

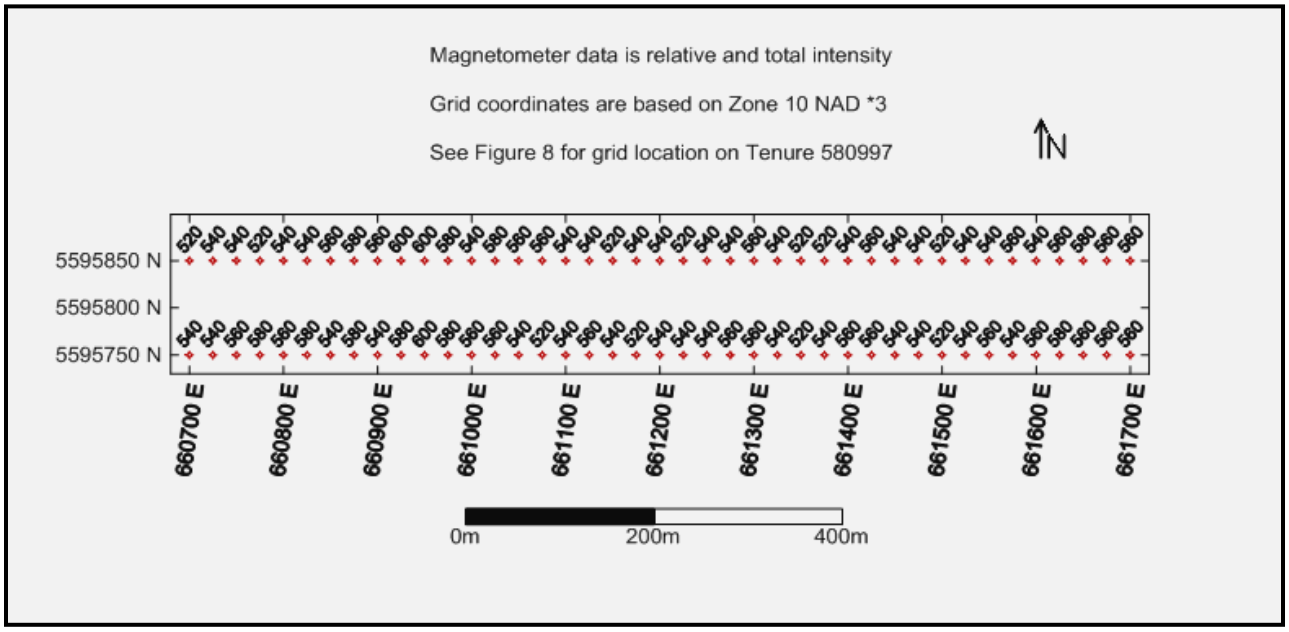
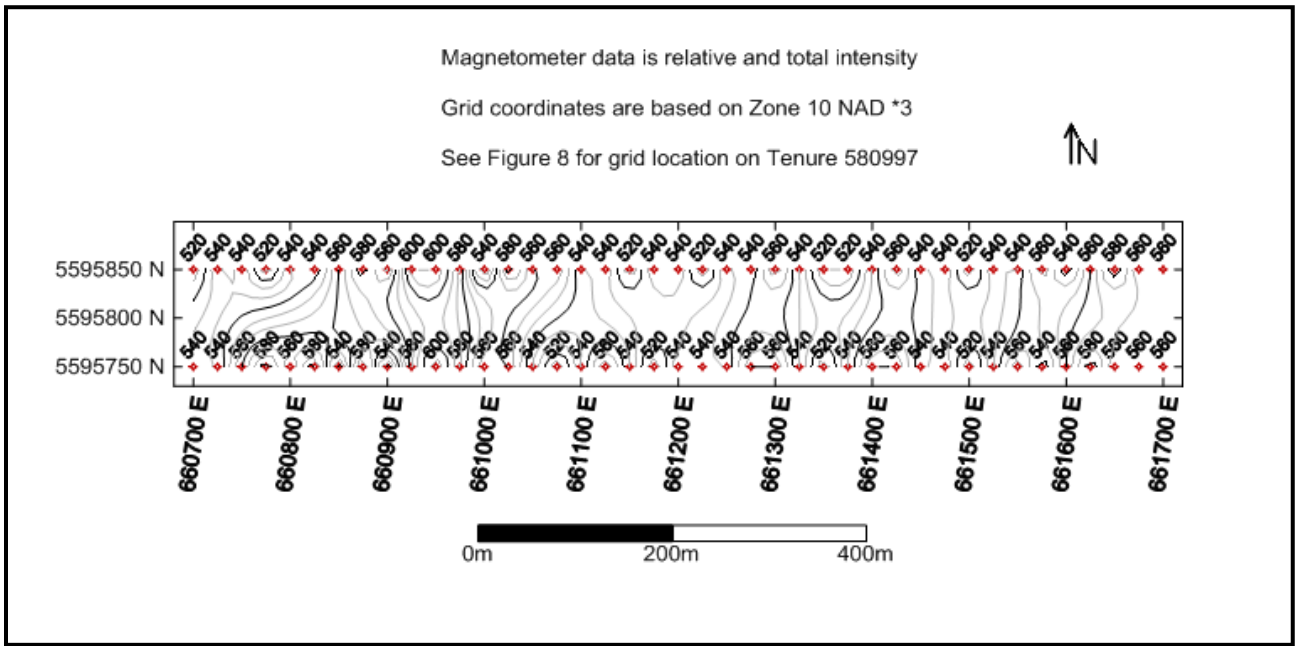
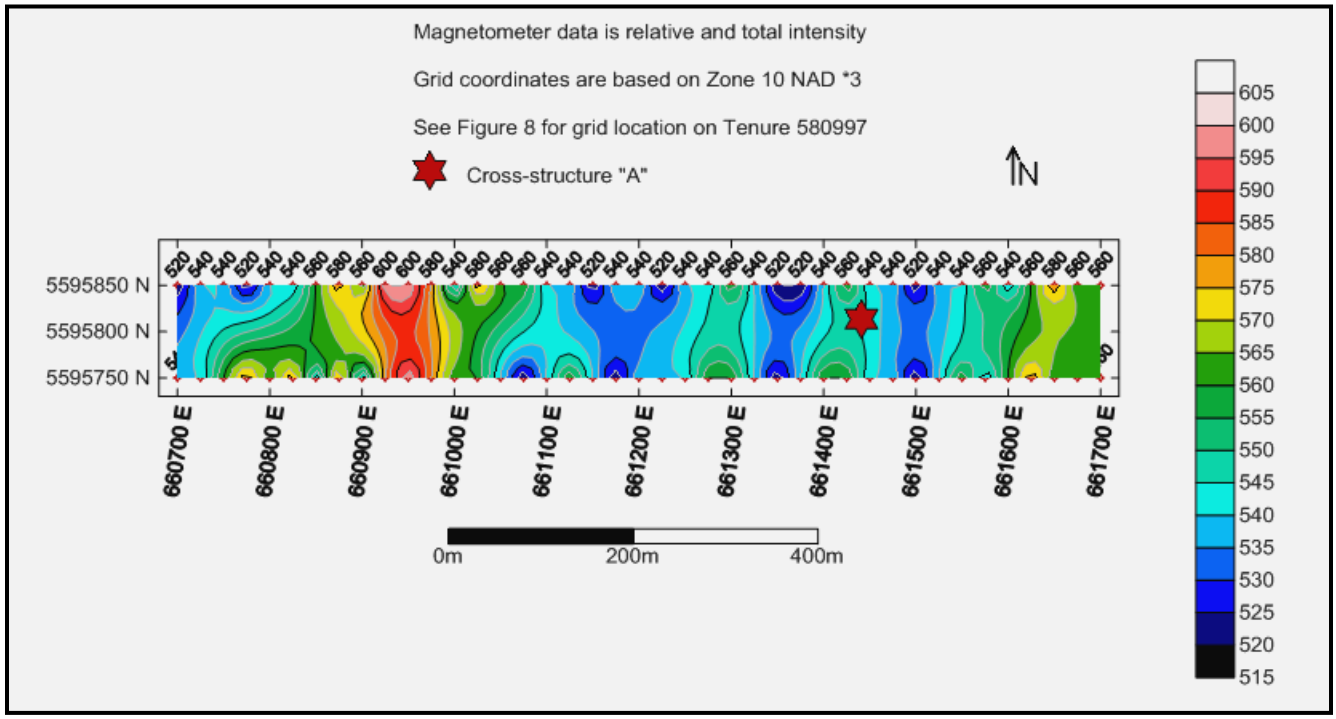



*Figure 10.* **Magnetometer Survey Data Contoured**



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

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




**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.

**e) Results** *(Figure 11)*

The magnetometer survey which covered volcanics, indicated relatively flat data without any significant anomalous trends. The many localized northerly to northeasterly trending relative mag LO's over a 450 metre zone, dominate with one relative 25 metre wide mag HI zone in the west.

Cross-structure "A" is located within a relative low background area within the 450 zone and is proximal to a relatively lower or sub-anomalous mag LO

## INTERPRETATION and CONCLUSIONS

The cross-structural location resulting from the structural analysis of Tenure 580997 as indicated Figures 5 and 7 would be the prime prospective areas to explore for surficial geological indicators of a potential underlying mineral resource.

The structural intersection between the northerly and the northwesterly indicated primary major structures would be a zone of increased fractural intensity and/or localized breccias which would be ideal conduits for pressurized, mineralized hydrothermal fluids to surface or be deposited within any well fractured intervening area which may result in an economic zone of porphyritic mineralization. The Highland Valley porphyry deposit is a prime example of a structurally controlled mineral deposit.

Although the 10 claims of the Bertha 580997 Claim Group and specifically the structurally analyzed Tenure 580997 claim, are predominantly underlain by volcanics of the Nicola Group, not the preferred host to mineral deposits (except for the limestone units and fractured zones adjacent to mineralized porphyritic intrusives), smaller intrusives occurring as satellitic stocks related to the Guichon Creek Batholith outcrop on the Property, such as at the SA mineral showing, may be the primary mineral host. These stocks can be surface indicators of intrusive related porphyry mineralization at depth.

Some of the Minfile of mineral showings described herein hosted by the volcanics are related to zones of increased fracturing and could be indicative of proximal major cross-structural zones. Other Minfile mineral zones relate to limestone units or limy horizons within the volcanics and are potential Craigmont skarn mineral deposits.

An example of more definitive surficial geological indicators on the Bertha 580997 Claim Group from a source at depth is at one of the three Minfile descriptions on the Property: the Rhyolite mineral showing is reported as porphyry mineralization related to a basalt host and a shear zone trending at 335 to 345 degrees. Mineralization at the Bertha Molly past producer is also structurally controlled with an apparent north trend.

In the magnetometer survey, which was within a volcanic area and positioned over cross-structure "A", the low level relative anomalous/sub-anomalous mag HI is possibly a localized skarn zone or a mafic dyke within the volcanics. The localized relative mag LO's can be dynamic and/or hydrothermal created alteration zones associated with the 450 metre zone of en-echelon (?) structures associated with cross-structure "A".

Even though the mag differential values are relatively low, this en-echelon zone of indicated possible hydrothermal alteration should be explored for geological indications of a deep seated porphyry mineral resource. The geological evidence, amongst more direct indicators, may be indicated by pathfinder elements and/or hydrothermal alteration products.

Excluding other variable geological conditions, the structures are essential in the localization of potentially economic porphyry and/or quartz vein hosted mineralization within related intrusives to the Guichon Creek Batholith and/or the host units of the Nicola Group.

Respectfully submitted
Sookochoff Consultants Inc.


Laurence Sookochoff, PEng

## SELECTED REFERENCES

**Ayuso, J.D.A.** et al – 2010, Porphyry copper deposit model, chap. B of Mineral deposit models for resource assessment. U.S. Geological Survey Scientific Investigations Report 2010-5070-B. 169 p.

**Corbett, G.,** 2007. Controls to low-sulphidation epithermal Au-Ag mineralization. Unpublished paper,

**Garrow, T.** – 2010 Diamond Drilling Assessment Report on the Dansey Project for Highland North Inc. January 20, 2012. AR 32,980.

**Guilbert, J.M., Park Jr., C.F.** - The Geology of Ore Deposits. Waveland Press, Inc. 2007.

**John, D.A.** - Porphyry Copper Deposit Model. Scientific Investigations Report 2010-5070-B.U.S. Department of the Interior. U.S. Geological Survey, Reston, Virginia: 2010.

**Holcombe, R.** – 2009: GEOrient, ver 9.4.4. Stereographic Projections and Rose Diagram Plots

**MapPlace** – Map Data downloads

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

**MtOnline** - MINFILE downloads.

092ISE002 – BETHLEMEN (EAST JERSEY)
092ISE009 – FORD
092ISW012 – HIGHLAND VALLEY COPPER
092ISE012 – BERTHA – MOLLY
092ISE021 – RHYOLITE
092ISE167 – SA
092ISE196 – PLUG

**Pareta, K., Pareta, U.** – Geomorphological Interpretation Through Satellite Imagery & DEM Data. American Journal of Geophysics, Geochemistry and Geosystems. Vol 1, No. 2 , pp19-36.

**Sookochoff, L.** – Geological Assessment Report on a Structural Analysis on Tenure 585374 of the Bertha 585374 Claim Group for Guy & Christopher Delorme. April 9, 2014. AR 34738

## STATEMENT OF COSTS

Work on Tenure 580997 was completed from May 15, 2015 to June 15, 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 | |
| June 14, 2015 to June 15, 2015 | |
| Four man days @ $300.00 per day ---------- | 1,200.00 |
| Truck rental, kilometre charge, fuel, room & board, | |
| mag rental ---------- | 1,092.55 |
| | $ 5,292.55 |
| Maps ---------- | 750.00 |
| Report ---------- | 3,500.00 |
| | $ 9,542.55 |
| | ====== |

## 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 Selected Reference section of this report and from work the author has performed in the Bertha Property area.

5) I have no interest in the Bertha 580997 Claim Group as described herein.


Laurence Sookochoff, P. Eng.

*Appendix I*

# Magnetometer Data

| E5557831 T580997 | | | | | | |
|---|---|---|---|---|---|---|
| **East** | **North** | **Mag** | | **East** | **North** | **Mag** |
| 661700 | 5595850 | 560 | | 661700 | 5595750 | 560 |
| 661675 | 5595850 | 560 | | 661675 | 5595750 | 560 |
| 661650 | 5595850 | 580 | | 661650 | 5595750 | 560 |
| 661625 | 5595850 | 560 | | 661625 | 5595750 | 580 |
| 661600 | 5595850 | 540 | | 661600 | 5595750 | 560 |
| 661575 | 5595850 | 560 | | 661575 | 5595750 | 540 |
| 661550 | 5595850 | 540 | | 661550 | 5595750 | 560 |
| 661525 | 5595850 | 540 | | 661525 | 5595750 | 540 |
| 661500 | 5595850 | 520 | | 661500 | 5595750 | 520 |
| 661475 | 5595850 | 540 | | 661475 | 5595750 | 540 |
| 661450 | 5595850 | 540 | | 661450 | 5595750 | 540 |
| 661425 | 5595850 | 560 | | 661425 | 5595750 | 560 |
| 661400 | 5595850 | 540 | | 661400 | 5595750 | 560 |
| 661375 | 5595850 | 520 | | 661375 | 5595750 | 540 |
| 661350 | 5595850 | 520 | | 661350 | 5595750 | 520 |
| 661325 | 5595850 | 540 | | 661325 | 5595750 | 540 |
| 661300 | 5595850 | 560 | | 661300 | 5595750 | 560 |
| 661275 | 5595850 | 540 | | 661275 | 5595750 | 560 |
| 661250 | 5595850 | 540 | | 661250 | 5595750 | 540 |
| 661225 | 5595850 | 520 | | 661225 | 5595750 | 540 |
| 661200 | 5595850 | 540 | | 661200 | 5595750 | 540 |
| 661175 | 5595850 | 540 | | 661175 | 5595750 | 520 |
| 661150 | 5595850 | 520 | | 661150 | 5595750 | 540 |
| 661125 | 5595850 | 540 | | 661125 | 5595750 | 560 |
| 661100 | 5595850 | 540 | | 661100 | 5595750 | 540 |
| 661075 | 5595850 | 560 | | 661075 | 5595750 | 520 |
| 661050 | 5595850 | 560 | | 661050 | 5595750 | 540 |
| 661025 | 5595850 | 580 | | 661025 | 5595750 | 560 |
| 661000 | 5595850 | 540 | | 661000 | 5595750 | 560 |
| 660975 | 5595850 | 580 | | 660975 | 5595750 | 580 |
| 660950 | 5595850 | 600 | | 660950 | 5595750 | 600 |
| 660925 | 5595850 | 600 | | 660925 | 5595750 | 580 |
| 660900 | 5595850 | 560 | | 660900 | 5595750 | 540 |
| 660875 | 5595850 | 580 | | 660875 | 5595750 | 580 |
| 660850 | 5595850 | 560 | | 660850 | 5595750 | 540 |
| 660825 | 5595850 | 540 | | 660825 | 5595750 | 580 |
| 660800 | 5595850 | 540 | | 660800 | 5595750 | 560 |
| 660775 | 5595850 | 520 | | 660775 | 5595750 | 580 |
| 660750 | 5595850 | 540 | | 660750 | 5595750 | 560 |
| 660725 | 5595850 | 540 | | 660725 | 5595750 | 540 |
| 660700 | 5595850 | 520 | | 660700 | 5595750 | 540 |