BC’s Golden Triangle

It Goes to Kitsault!

Channel sampling alteration at Big Bulk on Kinskuch Lake, near Kitsault.

KEG Conference
Kamloops
12 April, 2016
Various Golden Triangle Renditions

Skeena Resources ✗

IDM Mining ✗

Colorado Resources ✓

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Some Significant NW BC Au (Ag, Cu) Deposits

Red Chris:
1 Billion tons @ 0.35 g/t Au and 0.35% Cu (Measured + Indicated)

Eskay Creek:
2.5 Million oz Au & 158.9 Million oz Ag (Production)

Brucejack:
13.6 Million tons @ 15.7 g/t Au Proven and Probable Reserves (6.9 Million oz of Au)

Ascot Resources:
? M tons @ ? g/t Au (Annual drilling ongoing) (2.4Moz AuEq in 2013)

Mitchell/Kerr/Sulphurets:
2.7 Billion tons @ 0.55 g/t Au and 0.21% Cu (Measured + Indicated)

Deep Kerr:
782 Million tons @ 0.33 g/t Au and 0.54% Cu (Inferrred)

Snowfield:
Cat Tons @ Au Cu (mil) (g/t) (%)
Meas 189 0.82 0.09
Ind 1,180 0.55 0.10
Inf 833 0.34 0.06

Kinsluoch Project Area

Kitsault

Kitsault Mo Mine
Kinskuch Lake ("Kitsault") Area
Geology & Mineral Occurrences, Magnetics and Title
The geological setting and style of mineralization of Big Bulk, other than less deformation, is similar to the Kerr porphyry copper-gold deposit in the Sulphurets District (Ditson et al, 1995).

Smaller zones of mineralization at Big Bulk in this high level broad alteration zone are possibly similar to the Sulphurets District Brucejack Au-Ag vein deposits and possibly the Snowfield auriferous quartz stockwork mineralization (Margolis et al, 1995).
KSM / Kinskuch Geological Setting Similarities

- Both on major anticlinoriums
- Both host Au (Cu) mineralisation close to the Stuhini / Hazelton contact.

Recent BCGS Research in the Triangle

Publication Year
- KSM/Brucejack: 2014
- Bronson Corridor: 2015
- Kitsault - Red Mtn “2016”
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BCGS Brucejack / KSM Research (2014)


World Class Research!
Steeply northeast-dipping normal-sense shear zones (yellow) on higher part of the ridge separate panels with low-angle normal shear zones. A single thrust fault (red) forms the hanging wall of strong quartz-sericite-pyrite alteration in ‘Pins bowl’.


World Class Research!
2014 / 2015 Research Conclusion

“In the KSM / Brucejack Camp and in the Bronson Corridor, Early Jurassic extensional +/- wrench faults and related basins controlled intrusion, alteration and porphyry and related mineralisation.

Footwall zones of pervasive QSP alteration facilitated later re-activation of basin-bounding faults as thrust faults.

Northwestern Stikinia porphyries – its all their faults!”

JoAnne Nelson
KEG Conference
April, 2015
BCGS Kitsault – Red Mtn Research (2016)

BCGS Kitsault – Red Mtn Research (2016)

Summary

★ Same as KSM / Brucejack

- Common Texas Creek intrusions ★
- Porphyry-style, epithermal, stratiform mineralization proximal & distal to intrusions
- Strong structural control

- No Jack Fm: too far from arc?

- Unconformable – conformable ★
  - Stuhini-Hazelton contact, olistostrome → Tectonism

- Basinal siliciclastics (back-arc?)

The Kinskuch Area hosts many Au (Cu)-bearing Porphyries (likely all Texas Creek age).

- **Homestake** (before 2003)
- **Copper Belt** (before 2003)
- **Midnight Blue** (2008)
- **FH** (before 2003)
- **Name** (first documented)
- **St David & JC** (2008)
- **Big Bulk** (before 2003)
- **“North Illiance”** (before 2003)
- **Ajax Mo Porphyry** (Eocene)
- **Kitsault Mo Porphyry** (Eocene)
The Kinskuch Area has Rifting

The Kinskuch Area has Inverse Rifting and Thrusting


Inversion structures with regional fabrics and fold structures

Main west dipping inversion structure

Transverse inversion structure

Main inversion - intra-rift structure East dipping

Inversion branch

‘Grey’ are possible inversion structures with dip indicated

Thick L/M Jurassic volcanics and sediments in HW

Transverse fault zone- possible inversion of Bowser basin?
The Kinskuch Area has Epithermal Au/Ag and VMS Ag Deposits with Resources

Structural model for the Homestake Ridge Epithermal Au/Ag Deposit

Source: Homestake Resource Corporation (2014)

Current Inferred Resource
8 million tons @ 3.7 g/t Au and 87 g/t Ag (1 Moz Au and 22 Moz Ag).

Structural model for the Dolly Varden VMS Ag Deposits

Source: Dolly Varden Silver Corporation (2014)

Current Indicated Resource
3 million tons @ 321 g/t Ag (32 Moz Ag). Historic production = 20 Moz Ag.

Aside: Coller (2008) identified inverse rifting in the McGuire Anticlinorium – but not invoked in these interpretations.
Epithermal and VMS: Close Cousins

Lake Assal, Afar Triangle, Ethiopia

... and new VMS Drill Targets at Illiance

**Target:**  Dolly Varden / Homestake / Eskay Creek – Style Gold / Silver / Base Metals deposit

**Primary Evidence:** 2011 DDH intersections; Surface channel sampling; 2011 Airborne EM conductivity anomaly.

**2011 Results:**

- **KN11-03**
  - 3.9m @ 267g/t Ag, 6.5% Zn & 1.3% Pb.

- **KN11-02**
  - 2.8m @ 3.18 g/t Ag, 6.5% Zn & 2.2% Pb.
... and Au/Cu-mineralized porphyry targets with visible epithermal gold (telescoped?)

21m @ 0.86% Cu 0.64 g/t Au (12m – 33m) and
50m @ 0.33% Cu 0.21 g/t Au (145m – EoH)
in BB03-02
Big Bulk Drill Target: Modal Mineralogy

Petrology by Brock Riedell

Georeference Online Ltd.

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**Big Bulk: Structure**

**Key Elements:** Rift inversion was documented in 2008 by Coller at Kinskuch and in 2014 by Nelson at Brucejack - where mesothermal Au mineralisation is post-Texas Creek age and structurally controlled. High resolution UAV-based photogrammetry for structural mapping was initiated at Big Bulk in 2015.

**Work Required:** UAV-based photogrammetric survey of the entire Lavender Mountain massif as the basis for detailed structural mapping of the Big Bulk intrusive complex.

Visible Au on a vein surface here

**Major structures identified by Coller in 2008.**

Computer-recognised structural features in UAV-derived DTM

www.eosys.fr

Cm-resolution colour orthophoto overlaid on meter-resolution b&w orthophoto used for Coller study.

Rose Diagram & Stereo

Net of above features

www.eosys.fr
Big Bulk: Mining Logistics

Key Elements:
* Vehicle access to Kinskuch boundary;
* Kinskuch property is alongside tidewater;
* Powerlines run to Kinskuch boundary;
* Long history of mining at Dolly Varden;
* Neighbour to ~$800 million fully-permitted Kitsault Mo mine-development project;
* Neighbour to ~1M oz AuEq resource at Homestake Ridge;
* Neighbour to ~40M oz Ag resource at Dolly Varden;
* Tunnel access (7 - 9 km) possible from Kitsault River valley to 800m below level of Kinskuch Lake

Horizontal tunnel access is possible to almost any u/g mine site within the Lavender Mountain massif.

“Steel Rails and Silver Dreams”, available on Amazon, documents the history of the Dolly Varden silver mines.
Big Bulk: Glacial Retreat exposing Mineralisation

Key Elements:
* Significant glacial retreat over Big Bulk since Teck Corporation mapping in 2002 (documented with 2015 UAV-derived orthophotographs);

* The same applies to glaciers over mineralisation observed in other parts of the Lavender massif, last prospected in 1991 (see next slide).

Below: 1966, 2005 and current glacier edge over Brianne Zone of the Big Bulk system (Roundup 2016 poster extract).
Kinskuch: Geophysics

Key Elements:
Big Bulk is on the western flank of a 20km by 10 km regional magnetic high which is oblique to the NW strike of the – the likely extent of a multi-phase intrusive system.

Significant chargeability and resistivity variation has been mapped within the system.
Another Relevant Model: Baguio Area, Philippines

Economic Geology, Vol 106, #6 (2011)
The McTagg and McGuire Anticlinoriums: Comparative Stratigraphy and Intrusive History

Another World Class Report >> World Class Discovery?

Source: Homestake Resource Corporation (2014) - Rob Macdonald

Source: BC Geological Survey (Van Straaten, 2016)
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(Because he says so.)

More information at:
www.bigbulk.ca

Interactive online map available at:
http://editor.giscloud.com/map/464394/kinskuchview1

Bram van Straaten,
Senior Minerals Geologist, BCGS,
at Big Bulk on Kinskuch Lake,
near Kitsault, in 2015