

# **New BUZZ in the BIZ? Geology and mineralization in the Anahim area**

Energy, Mines and Petroleum Resources

# Introduction

In an area extending from Kamloops northward to Smithers, and from the Coast Mountains eastward to the Rocky Mountain **Trench, infestation by Mountain Pine Beetle** 

was essentially continuous in 2004. We refer to this area as the Beetle Impacted Zone (BIZ). It is predicted that only ~10% of the already diminished 2006 volume of pine will be left standing by 2016 (Eng et al., 2006). Anticipating an economic downturn in the forestry sector within the BIZ by 2015, the Provincial Government has worked to stimulate Contiguous Beetle Infested Zone (BIZ) Intermontane CacheCreek Stikine economic diversification throughout the region. Geological mapping and related studies in the Chilanko Forks area (mapsheet 93C/01) are part of that provincial effort.

Accelerated timber harvest and overburden disturbance, needle loss, and forest fires, create unprecedented opportunities to find never-before-seen outcrops of prospective rocks within the BIZ.

# **Under-explored** Potential

Much of the BIZ has been avoided by mineral explorationists because of a perceived great thicknesses of unmineralized volcanic rocks and glacial cover (Figure right). However, rock exposures are more widespread than indicated on most existing maps and exposures of basement rocks throughout the BIZ show that the pre-Cenozoic geologic fabric continues in the subsurface. So as shown by density of too, will the related belts of high mineral potential. Areas within the same geological belts show 400% more recorded mineral production south of the BIZ.



Expenditure values in	3200000
dollars/square km	1600000
C	800000
Contiguous Infestation	400000
BC Ministry of Forests	200000
<ul> <li>2004 Forest Health Survey</li> </ul>	100000
	0

**BIZ** exploration deficit exploration expenditures (ARIS, above). Note extension of high value belts north and south of the BIZ.





thick "ductilely sheared assemblage" which is exposed along eastern Tatla Lake. A subsidiary exposed along eastern Tatla Lake. A subsidiary extension fault may be exposed near the eastern edge of 93C/01 where Chilanko intrusive complex rocks are overprinted across a <20m wide zone by strong banding (Photo A). Pytgmatically folded veins cut mylonite banding (Photo A). Pytgmatically folded veins cut mylonite, which was then recrystallized, cut by brittle fault sets (Photo B), brecciated and quartz cemented (Photo C). The sequence of events is consistent with ductile to brittle transition during structural exhumation.

Mitch Mihalynuk and Jeff Larocque

# Mineralized arcs



A prolific period of Cu-Au±Ag mineralization accompanied waning Late **Friassic** arc formation. Coeval deposits span the length of

Quesnel and northern Stikine arcs. However, no coeval deposits are yet known in southern Stikine arc, which underlies the western half of the BIZ. The BIZ Buzz is that...

THERE'S MORE TO EXPLORE



## Stacked & Detached Volcanic Arcs

Geology of the Chilanko Forks area is dominated by Late Jurassic and Eocene arc complexes. However, evidence also exists for Cretaceous (~104Ma) and Late Triassic-Early Jurassic arc strata. All arc strata in existence were deformed around 155Ma, and again in the early Eocene, synchronous with Tertiary extension. Structural omission across the detachment is LEGEND estimated by Friedman (1988) as  $\sim 13.5 \pm 10$  km, with high-grade rocks separated from greenschist grade rocks by the 1–2.5 km



sides of the Intermontane Belt (*Figure top left panel*), as seems necessary to **Ootsa Lake Grou** explain normal faulting in central BC across tens of thousands of square kilometres. Eocene crustal extension is consistent with widespread fission track data indicating rapid cooling between 55 and 50 Ma. Detachment-related Cu-Au-Ag-Pb-Zn deposits are known in the southwest US, but are a largely unexplored deposit type in British Columbia. Exploration opportunities exist for this type of mineralization in BC, especially if the Tatla Lake metamorphic complex is part of a much more regional detachment system.

#### **Available as Geofile 2009-2**

on-line as a downloadable file at: www.mapplace.ca see Publications Catalogue

# Chilanko Forks mapping

Our mapping extends 2.5 mapsheets from the Chilanko Forks area shown here, northward to the Clusko River sheet, near the Clisbako epithermal property.

Block faulted and weakly folded ~55Ma Ootsa Lake Group strata are deposited on ~100Ma arc rocks atop deformed 150+ Ma arc rocks.

# Deposits in extended crust

A crustal-scale shear zone may link core complexes on both



FIT

quartz-calcite veins and replacements (*Photo top left*) with up to 0.18% copper, 2.2 g/t Ag, and 20 ppb Au. About 750m to the northwest, a sample of the thermal halo returned 0.37% Cu, 2.87 g/t Ag and 63 ppb Au.

EJOWRA A grab sample collected ~ 4 km southeast of Fit Mountain returned 0.58% Cu, 4.2 g/t Ag and 40 ppb Au. A large angular block (probable erratic) 1.1 km to the northwest is more than 10% pyrite and a grab sample from it contained 7.47 g/t Te. The probable erratic is up-ice of the outcrop sample and must be derived from a separate mineralized zone (or one that is continuous for over 1 km).

Veins of quartz-calcite–epidote–chlorite-chalcocite and malachite up to 15 cm thick contain knots of chalcocite up to 2cm across. Grab samples contain up to 0.12% Cu & 0.2 g/t Au. To the southeast, grab samples of another mineralized zone contained 2.8g/t Ag and 0.12% Cu (ST on map).

**ERRATIC** North of eastern Tatla Lake an erratic of foliated granodiorite contains intrafolial chalcopyrite-malachite (and ?tetrahedrite) returning 0.4% Cu and 2.4 g/t Ag). This large (~3.5m<sup>3</sup>) erratic lies within 100m of unmineralized outcrop.



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## What's in it for you?

In at least some regions of the BIZ, and perhaps most regions, a reputation of low mineral prospectivity and unbroken cover is unjustified...

> The buzz in the BIZ is that there is there's more left to explore



Bornite - chalcopyrite - magnetite at the Fit showing

# MINERALIZATION



Prior to 2008, no MINFILE occurrences were reported from the Chilanko Forks area. During 2008 fieldwork, 4 new areas with minor mineralization were discovered. They are located within, or adjacent to the Chilanko igneous complex:

FIT & FIT northwest Copper – silver mineralization is found on Fit Mountain in chlorite-magnetite-altered tonalite outcrops and boulders over  $\sim 50 \text{ m}^2$ . Veinlets and disseminations of chalcopyrite and subordinate bornite occur with epidote-magnetite-chlorite-

