→ Sulphurets.

Sulphurets

104B193
888166

LAWE/

March 23/93

→ Informal Meeting at Northair
w/ Dave Visagie, Brian Malahoff, Fred Bruce Hewitt(?), James Macdonald, Ron Britten, Henry Marsden and Margaret Macpherson (pot. Northair employee!)

JAMES MACDONALD OVERVIEW:

- little evidence for subaerial volcanics → rare
- flow domes are well developed at Bruce jack – they "transcend" the intrusive-extrusive setting → extensive marginal flow dome breccias

- Sulphurets area: possibly shallow mineral deposits toward the south end of the area & deeper deposits in the north end.

- flow domes & intrusions dated @ 185 Ma & are ~~[illegible]~~ corelative.

- pebble dykes; also large eliptical hydrothermal breccias

- West zone – ductile zone in which an awful lot of strain was taken up; a shear zone that at times acted brittley during vein emplacement (several episodes of vein emplacement)
- Waterfall zone – is it the surface projection of UTC zone?

- get brittle deformation between West zone and '367' zone (to the west across the Brucejack lineament).
- more carbonate associated with brittley deformed Brucejack lineament area than in ductile zones such as West zone where veining is almost exclusively silica.

- James investigated fluid inclusions from West zone, but ~~determined that~~ could not find primary inclusions ∴ not worth following up.

- Shore zone also somewhat of a ductiley deformed zone, but not as intense as West zone.

- scattered zones of mineralization south of the West zone cross Brucejack lineament (& ∴ are younger

- sinistral sense of shear to West zone - based on geometry of rotational fabric & most intense ~~shearing~~ deformation ~~event~~ episode.

- Peter Lewis will look at the area of West zone relative to the regional structural picture.

KEG '93

SULPHURETS GOLD / KERR - Brian Fowler Apr. 28/93

Snowfield adularia-sericite epithermal (Margolis)

1992: PDI - $2.5 m drill program on Kerr + Sul. Gold!

- high level porphyry system

a) Raewyn Cu-Au Zone (±Mo)

195 Ma - Kspar
185 Ma — cf. Cretaceous ages Raewyn thrust!

- typical por.
- sec. bio

cpy, MoS_2
qtz
- monzonites + Kspar alt'n

b) Breccia Gold Zone

hydro. intr. bx, - rounded frags.
- Au assoc. with py (0.1 to 0.6 g/t Au + 0.1% Cu)

- later hydrot. sulphi bx. - local tourmaline

0.1 to 2 g/t Au (3.5 g/t Au) - less py.
+ 0.1% Cu

- strike geom dip 45° to NW

→ NEED to continue exp'n downslope to SW - 2 km of strike

Res.: not meaningful
Pot = "Large intr. bx. target 5 to 20 m tonnes of 2-7 g/t Au

Stage 1 - Raewyn monz.
Stage 2 - Raewyn structural panel (+ tour + Au + Mo)
" 3 - late vein remob. of cpy, tetra, arsen, Mo
4 - Post ore dykes
5 Renewed movement - thrust faults.

SULPHURETS GOLD

Mar. 4/04

- chat with Mike Savell in Noranda (Toronto office) [part of "Catching the wave"] [Allan Huard to run Kerr field program]
- Mike went thru Laptop presentation on Kerr-Sul.

* AMEC – doing scoping study for tailings impoundment, waste rock disposal and permentability
* 14 yr agreement (with Seabridge) i.e. no hurry-in it for long run
* 2003: 1 month in field – i) 2wks based @ Heritage (Eskay Ck.) camp; ii) 2 wks based out of Stewart (weathered in ~3/4 of time
* 2004: Reclamation work + Target work: $500K (approved) budget + good pot. for additional $500K for follow-up drilling in Fall. (i.e. total ~ $1M)
* Iron Cap Zone: Noranda "likes" potential
  Eg. 0.6% Cu + 0.4 g/t Au + new showing (discovery) as a result of 'recent' ice/glacier melt ⟹ 2.5% Cu + 2.2 g/t Au
  – will drill in 2004.
* Sulphurets Gold: ~ 54.8 MT @ 0.32% Cu + 1.02 g/t Au (in-house est.)
* Main Zone: secondary biotite (ID by Dave Carson)
  0.4 to 1.68% Cu + 0.3 to 1.1 g/t Au [i.e. close to core of system]
* Raewy Copper Zone: 56 MT @ 0.4% Cu + 0.6 g/t Au
* Sulphurets Breccia Zone: 11 MT @ 0.1% Cu and 1.4 g/t Au
* MacQuillan Zone: eg. 0.47% Cu and 0.3 g/t Au

(OVER

* Canyon Zone
* West Mitchell Zone
* Previous 'Proposal' (by Placer Dome):
  - Proposed access tunnel to SE, to Bowser River (Lake) Valley
  - Tailings: - under water in Bowser Lk.
  - Waste Rock: - will have to be <u>treated on site</u>!
* Power source - Forest Ken?
* Potential operating problem (AMEC) - Snow?
* First Nations? - OK (Tahltan); Nishga(?)
* LRMPs (?) - No! (Nass)

SULPHURETS (Bruceside) June 21/04
- chat with Bob Quartermain
→ Silver Standard still owns
- previous $4M 'deal' with shady character, Morris - fell thru
→ still "for Sale" - maybe $20M?

Kerr-Sulphurets Gold Oct. 10/02

- chat with Robin Adair + "JD" (Noranda-Lava
- RA is now "Mr. Nickel" with Noranda

→ Long discussion re - 'Environmental' issu

i.e. committed to 'cleaning up' the site next yr. (by Sept 30/03) at a FIRM (as agreed by Noranda Senior Mgt.) cost of $250,000 (i.e. no more!)

→ Only if Noranda accomplishes this, (it's okd by the Gov't, of course, - will it proceed with the option (i.e. Seabridge's current bond (which we transfered from Placer).

⟹ Noranda really likes the NORTH portion of the property (i.e. Mitchell, Iron Cap, e

- Next Yr. ('03) → reclamation - plus 'basic (grassroots) exploration → from staging area near Eskay

- Some minor concern over cross-border (US-Canada) - i.e. Ung

- Happy with First Nations (i.e. Tahltan)

SULPHURETS GOLD

Apr. 22/99

- discussion with Rob Pease
  [re - sale of: 1) Berg 2) Howards Pass 3) Sulphurets Gold (not Kerr)

- Note: Placer Dome Annual Report (1993)

  * Kerr/Sulphurets = 174,181,000 tonnes @ 0.5 g/t Au

  [est. Sul. Gold - 20 MT @ 0.8 g/t Au]

* Sul. Gold, needs more expl'n - but, good potential.

[Note: PD would consider selling Sul. Gold and Kerr as a package; however, PD may still need to do some reclamation (+ARD) work at Kerr beforehand]

Province of British Columbia

MEMORANDUM

TGS → Sulphurets

TO: Brian Fowler
Placer Dome Inc.
1440 Hugh Allan Dr. Kamloops

FROM: Tom Schroeter
GSB – Van

SUBJECT: Sulphurets Gold

DATE: Feb. 23/93

FILE: Por. - Sulphurets

- [x] For Your Information
- [ ] Please O.K. and Return
- [ ] Please Discuss With Me
- [ ] Per Your Request
- [ ] For Your Signature
- [ ] Please Process
- [ ] Return With More Details
- [ ] Investigate and Report
- [ ] Please Answer
- [ ] For Your File

Brian: (1) Negatives from Sulphurets Gold core, as requested.

(2) Porphyry Sequel – Ron Wells mentioned the possibility of producing two separate papers – a) Sulphurets Gold (+ Mitchell, Iron Cap, etc) (PD et al) + b) Snowfield Zone (Homestake – Britten et al) Any comment?

REPLY:

(3) See you at KEG!

Cheers,
Tom

Fold Here for Window Envelope

Southern Paragon MANUFACTURED IN VICTORIA

REMOVE THIS SHEET AND FORWARD BALANCE OF SET

OCT 6/92

Sulphurets Gold Zone — Dave Visagie

35 - 40 occurrences on ground.

new "S.G." zone - trenched
assays 74 opt. over 2 m widths.

- NEXT YEARS BUDGET - 1.0 to 1.3 million
  - lots of ddh!

- exploration ran from mid July to Sept 22
- late start due to extensive snow pack.

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

To: Brian Fowler Date: Aug. 20/92

From: Tom Schroeter

- [ ] For your approval.
- [x] For your information.
- [ ] For necessary action.
- [ ] Send me copy of reply.
- [ ] For your comments.
- [ ] Prepare reply for my signature.
- [ ] Prepare draft of reply.
- [ ] Return to me.
- [ ] File.
- [ ] For signature.
- [ ] Wish to discuss.

Re: SULPHURETS GOLD

Close-up photos of selected core – hope they're of some use to you.
Thanks again for your hospitality and good luck!

Cheers,
Tom

M26-1737

SULPHURETS GOLD AUG 4/92
DDH SG 92-2 27m
GOLD RICH SECTION IN LOWER PLATE
KSPAR ALT. DUST TUFF?; SEDS?
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG, 92-2 132m
CPY-RICH, BT ALTERED INTRUSIVE (DYKE?)
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG, 92-2 87m
DUST TUFF CRACKLE BRECCIA
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-2 126m
ALTERED (SILICIFIED) INTRUSIVE; FRACTURE
CONTROLLED CPY; PATCHY SECONDARY BIOTITE
IN INTRUSIVE TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-2 126m
FRACTURE CONTROLLED CPY IN INTRUSIVE
HOST ROCK
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-2 120m
ETCHED & STAINED INTRUSIVE SHOWING
PERVASIVE KSPAR ALTERATION; UNSTAINED
INTRUSIVE TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-8 236m
TOURMALINE AND PYRITE IN PALE GREEN
PROPYLITIC ALTERED INTRUSIVE (?)
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-8 236m
CLOSEUP OF TOURMALINE REPLACEMENT
ALONG PREFERENTIAL HORIZONS
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-10 55m
KSPAR PORPHYRY DYKE - UPPER PLATE
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-10 80-88m
CHLORITE ALTERED VOLCANICS AT BOTTOM OF
UPPER PLATE (80M); ALBITE (CARBONATE?)
ALTERED VOLCANICS AT TOP OF LOWER PLATE
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-19 32m
SILICIC AND SERICITIC ALTERED INTRUSIVE
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-19 62m
PY RIMMING CLASTS IN SILICIC
BRECCIA
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDG SG 92-19 159m
WATERLAIN TUFFS
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDG SG 92-2 135m
PERVASIVE BIOTITE ALTERATION
SPHERICAL SULPHIDE - PATCH BIOTITE
REPLACEMENT TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-2 135m
PERVASIVE SECONDARY BIOTITE
TAKEN BY TGS/RAL

SULPHURETS GOLD AUG 4/92
DDH SG 92-3 9m
PROPYLITICALLY ALTERED (EPIDOTE) SILICIC
SEDIMENTARY ROCK
TAKEN BY TGS/RAL

TGS → sulphuret

MDRU - UBC Iskut Project

Oct. 11/91

SULPHURETS

- James MacDonald
- documentation of flow dome complex in Unuk R / Betty Ck. (SW of Bruce Jack Lk)
- documentation of hydrothermal and igneo fragmental bx. bodies
- timing of West Zone min. — Steve Roach
- West Zone — structure/alt'n
- Epithermal (?) min.

MINERAL ZONING (N-S)

North (Mitchell Zone) — incl. 'frothy' silica (high level?)
- igneous bx. bodies

* Jake Margolis — thesis sponsored by Corona (Univ. Oregon)

WEST ZONE: hosts — Unuk River Fmn → up to Betty Ck.
→ waterlain int. to tuffaceous ~~ck~~ → flows (extrusive-phase)
Flow Dome (Bruce Jack Lk — south side) — well flow banded (folded) intrusive rk. → extrusive rk.
- need zircon dates!
- margins — bx. by hematitic, muddy matrix
- upper part = disaggregated ⇒ brecciated (incl. K-spar megacrystic extrusive)

- igneofragmental dykes (+ qtz. veins) — presumably lying above min. pos. system!

Hill Zone: cylindrical 150m x 50m (between West Zone + Galena Zone)

→ FW alt'n: 'spotty' — pressure shadows around py (i.e. early/prior)
- syntectonic defmn/min. incl. folding of original cleavage/etc. veins
- spatially restricted structural zone (fabric dies out to E + W)
- manganese replaced by silica (eq. à la MOX. Skukum)

R8 Zone (West Zone): incl. colloform textures (~100m downstream from camp site)
→ to south — apparent increase in epithermal textures! (OVER)

qtz - alunite ? → no comment (Margolis thesis)
(Britton) → pyrophyllite on Snowfields Zone
- need to try fluid inclusion work (for epithermals)

SULPHURETS — MEG — Mar. 15/89

Speaker: Fred Hewett
Intro: Nick Carter — Notes by: TGS — ~170

Mitchell Ck. intr. – sub-alkaline (dio → syenite → granite)
West Zone – syenite, QM intr. to SW; ands. to NE
1350 m level:
- rt. lateral movement along fracs./shears ± boudinaging
- at least 4 ore shoots I.D. to date
- 250 m strike + dip lengths – downdip to 200 m
  - rake to South
- Au mainly as electrum
- qtz + carb. mainly gangue
- 1250 to 1300 m level raise – 'spectacular' ore to date

UTC Zone: HW of West Zone Eg .408 opt Au over ~4 m @ 1125 m elev

West Zone
180 m strike length: ~850,500 tons @ .354 Au + 22.94 Ag
(to Aug. '88)
– New reserves – 'soon'

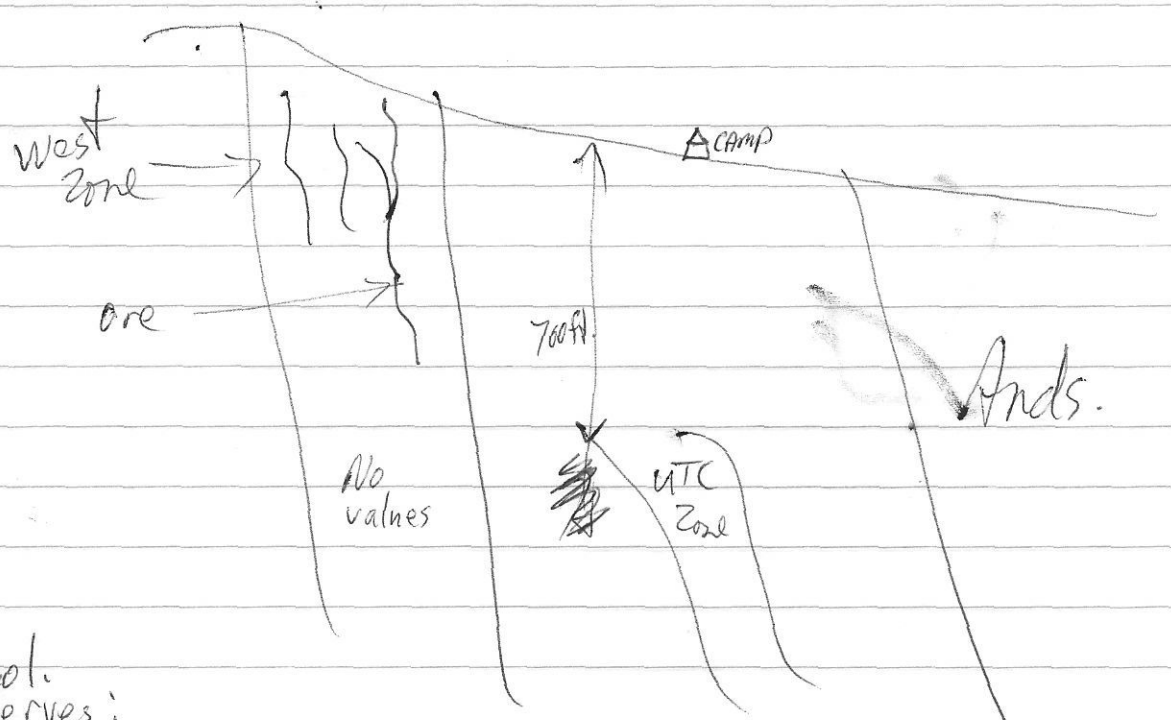
Shore Zone:
Golden Marmot Zone: disc. in 1988 – good potential!
Snowfield Gold Zone: Dissem Au in py-rich (10%) alt'd ands.
@ .08 opt Au to depths of 150 m
Pellin Res. = 7.7 m tons @ .077 opt Au.
Metallurgy: simple (> 90%).
Prod. Decision: 1989

QUESTIONS: $12 million spent to date
Thanker: Laurie Reinertson

NWMA
Dec. '88

SULPHURETS — West Zone: — Hewett

- extensional rt. lateral + conjugate shears — jalpaite
- sigmoidal + boudinage
- Main vein 250 m strike — 50-100 m - conjugate 'R' veins



Geol. Reserves:

854,072 tons .354 opt Au 22.94 opt Ag

SHORE ZONE 539,776 @ .263 opt Au 27.23 opt Ag

27,639 1.94 opt Au 3.51 Ag

Golden Marmot Zone: new 1988 find - similar to West Zone

Snowfields Zone - ser-chl. zone in ands
- ~0.08 opt Au to 150 m depth
eg. 7.7 m tons 'Hope' 20 m tons

SULPHURETS – Tom Brown Oct. 30/87

– Newhawk 60% ; Granduc 40%

Total Spent $8.85 m incl. 5.1 in 1987

up section
– Lower Jur. Unuk R. – andesitic tuffs = host rx.
– Salmon R. Fmn – fn. gr. seds.
– Mid. Jurassic dio. + syenites.

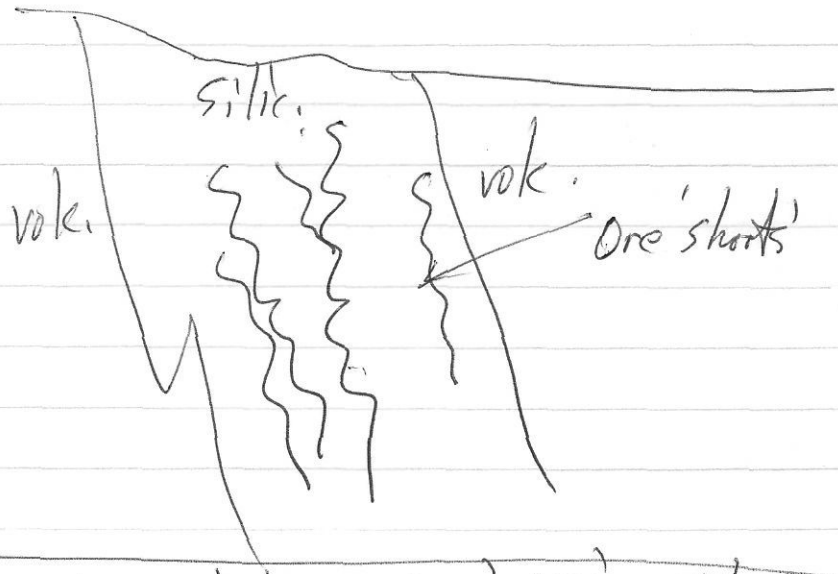
Altn – Ser., py, qtz, chl, clays
– Sericite unrelated to Au–Ag min. (apparently)
→ qtz. flooding + veining + potassic altn

WEST ZONE

1350m level

Electrum 60:40 Ag:Au

X-Sec.
West Zone



→ possible u/G mining → a) vein – stopes
→ b) bulk – block caving

- >400 m min. in length
- rare open spaced fillings
- 40m drifting on shoot - confirmed continuity.
- ~2500 ft. between West & Shore zones.

Shore Zone

Metallurgical tests: ongoing → 90% Au & 88% Ag

	Tons		
West	>1m	.332 Au	21 Ag
Gossan	28,000	1.9 oz Au	3.5
Shore	.5 m	.263 Au	27.23 Ag
Totals	1.5m	.336	22.86 Ag

In situ ~ $650 m @ 533,134 Au oz
36,207,445 Ag oz

SNOWFIELD Zone 7m @ .075 oz. Au/ton or 525,000 oz Au

SULPHURETS – Lefebure/Ballantyne/Hicks Oct. 30/87
– Wallrock Alt'n.

Types 1) Carbonate + sericite
2) Chl. + ~~chlor~~ carbonate
3) Ser – py – qtz
4) Qtz.

37 samples

Pathfinders – Pb, Zn, Sb – mainly 'halos'

Pyrite Halo – Thallium – up to 10 ppm
"Shoulder"
K_2O,
pyrite.

[cf. av. N.A ~ 100 ppm]

– Marginal – barium deficiency. [cf. enrichment in ore zone]
– Depletion of sodium. (<1%)

Strong Na-depletion

Mineral Inventory #5

104 B

Snowfields : 179
Sulphurets Ck : 020
Discovery (Sulphurets) 022
[West Zone]

Mitchell : 103
Goldwedge : 105
Iron Cap : 173, 174
Quartz Stockwork : 178

Kerr : 099, 101, 181, 188, 191, 192, 194, 198

Sulphurets Gold : 182
Hanging Glacier : 185
Bornite : 186
Kruchkowski : 187
Shore : 189
Gossan Hill : 190
West Zone : 193
Galena Zone : 196
5.9 Vein : 197
SPINE : 199
ELECTRUM : 200
UTC Zone : 345
Golden Marmot : 351

TO
Ron Wells
Lacana Mining Corp.
208 - 2985 Airport Rd. Kamloops V2B 7W8

FROM
TOM SCHROETER
B.C. Min. of Energy, Mines & Pet. Res.
Suite 159 - 800 Hornby St. Van. V6Z 2C5

SUBJECT
SULPHURETS

DATE
Mar. 19/86

- [x] For Your Information
- [ ] Please O.K. and Return
- [ ] Please Discuss With Me
- [ ] Per Your Request
- [ ] For Your Signature
- [ ] Please Process
- [ ] Return With More Details
- [ ] Investigate and Report
- [ ] Please Answer
- [ ] For Your File

Ron,
At the PDA I mentioned the presence of lavender coloured cerargyrite (AgCl), particularly in the Shore and Gossan zones at Brucejack Lake.
I've enclosed a sample of this amorphous material. I've also enclosed a sample of bright green cerargyrite from a past producer near Hawthorne, Nevada.

Good luck in your program this year.

Cheers

cc. Darrell Johnson

DATE OF REPLY

SIGNATURE Tom Schroeter

RETAIN THIS COPY FOR YOUR RECORD OF THE INQUIRY AND REPLY.

EVERGREEN PRESS LIMITED – CARBON READY SETS
1070 SOUTH EAST MARINE DRIVE/VANCOUVER 15, B.C./325-2231
SALES OFFICE 901 HOMER STREET/VANCOUVER 3, B.C./682-7722

MEMOGRAM

SULPHURETS AREA

July 2/85

- chat with Paul McGuigan
- Esso has returned entire property to Granduc Mines (possible option to Northair?)
- Paul feels a road could be built off of the Stewart-Cassiar Hwy. (37) east along Bowser Lake & then NW (ice rd) along Nipples Glacier.
- Paul feels a little uncomfortable about host age at Sulphurettes (i.e. 60-100my) i.e. feels better to have L. Jur. age (180-200my) as host! (eg. Tel. Ck. sheet)

TGS note
dates @ ~185 Ma

GAC - Victoria
May 14/83

SULPHURETS: Dane Bridge
- thick sec. of Hazelton Gp. rx. L to mid-Jur.
- 4 major intrusive ex:
N-S linear zone (10 km) assoc. with intr. rx.
1) Diorite
2) Syenodio
3) Syenite
4) Granite
} 2 belts

Brucejack assoc. with fn. gr. syenodiorites

AlMn - k-spar overprinted by sericite assemblages

A) Porphyry type: syenites & granites
Eg. Iron Cap area
py, cpy, MoS_2 / kspar, qtz, py, ser.
Eg. Mitchell Zone qtz veining in syenites
Eg. Moly. Zone: Sericite, qtz (incl. sheeted stkwk)

B) Cu-Au Zone (porphyry)
- ≥ 1 gm/t Au 3 km length
- sericite / qtz / py
- syenodiorites por. + intr. breccias
- tourmaline bx's with ser-py frags.
- andesitic tuff breccias
- 2-3 gm/t Au assoc. w. Cu-Mo-Au occurrences
- appear peripheral to main Cu-Mo zone
- no magnetite (cf. Sillitoe's nomd model)
- very high py content (10-15% by vol)
- Au + Cu do not correlate (cf. Sillitoe)
- Ni

~~Buck Creek 'Caldera'; Church,~~
~~"Ore related to Gabbro-Monzonite"~~

c) <u>Brucejack Lk. (epithermal)</u>
- southern portion of prop.
- plug-like syenodiorites
- 1 km alt'n zone ser-py-qtz.

- veins strongly <u>structurally</u> controlled (major faults + splays)

- i) <u>Near Shear Zone</u>; qtz-cal-sulphide
  - lack classic epithermal tex. (i.e. not drusy, etc.)
  - multiple veins + stkwk.
  - 5% sul – py, ZnS, tetra, PbS, electrum, cpy, argentite
  - 3:1 < Ag:Au
  - <u>Pervasive</u> sericite-silica alt'n.

Peninsula Zone

→ 4 parallel zones
- Qtz-electrum veins 'latest' (± Au values)

ii) <u>West Zone</u>: 300 m long
- pervasive stkwk (vs. vein)
- py, tetra, pyrarg, elec., argentite
- Ag:Au 20 to 85:1

- pervas'm sericite