

Atlin
880413

June 1986

**Compositional analyses of gold and associated minerals
in the Anna Claims and Sharon zone quartz vein system**

(Analysis performed by Dr. D.C. Harris)

Monarch Mountain - Anna claims

	F _T	Au	Ag	Cu	Sb	Hg	Bi	Te	Pb	S	Total
	835	84.1	16.6								100.7
	840	83.4	15.8								99.2
	840	83.7	15.9								99.6
$F_T = \frac{Au}{Au + Ag} \times 1000$	836	84.0	16.4								100.4
	854	84.1	14.3								98.4
	853	82.5	14.2								96.7
	Average	83.8	16.2								100.00

Average gold fineness is 843 for the 6 microprobe-quantitative analyses. No inclusions or alloys were noted in these visible gold specimens. The gold is essentially homogeneous within and between grains.

Monarch Mountain - Anna claims

	Au	Ag	Cu	Sb	Hg	Bi	Te	Pb	S	Total
Bismuthinite (Bi ₂ S ₂)										
			1.7	0.7		76.4		1.6	18.8	99.2
			0.7	0.6		80.0			18.7	100.0
Average			1.2	0.7		78.2		0.8	18.8	99.7
Tetradymite (Bi ₂ Te ₂ S)										
				0.3		59.8	35.0		4.9	100.0
				0.3		60.7	34.6		5.1	100.7
Average				0.3		60.3	34.8		5.0	100.4

Monarch Mountain - Anna claims

	Co	Fe	Ni	Cu	Zn	As	Sb	S	Total
Gersdorffite (NiAsS)									
	12.1	7.2	15.5			44.7		20.0	99.5
	9.7	8.9	16.6			44.5		19.6	99.3
	9.9	9.2	16.0			45.3		19.8	99.3
	10.2	8.4	17.0			44.8		19.6	100.0
	10.1	8.6	17.0			44.9		19.5	99.6
Average	10.4	8.5	16.4			44.8		19.7	99.8

Note that the Bi-minerals contain Sb and that bismuthinite contains Cu and Pb but Au is not present in these minerals and that Cu, Pb, Bi, Te, Sb are not found in the gold. The gersdorffite is a Co-Fe rich species.

For the samples we examined, gold may reach 2.2 mm in size and occurs: 1) as fracture fillings or as blebs in quartz, 2) with carbonate in fractures, 3) replacing gersdorffite, 4) with bismuthinite.

Textures observed in polished sections in the plates provided may suggest the following paragenetic sequence:

- 1) Partial to complete crystallization of Co-Fe rich gersdorffite. It may be assumed that Co-Fe-Ni and perhaps As are won from the associated alteration of the alpine ultramafics but the larger halo of As in altered ultramafics suggests that the initial hydrothermal fluids were enriched in arsenic.
- 2) Replacement of gersdorffite and/or open space filling by bismuthinite, gold, carbonate or quartz.
- 3) Contemporaneous with and/or following bismuthinite crystallization, gold replaces? gersdorffite.

No gold was found to be associated with pyrite and in fact that quartz and pyrite may be of a completely different generation or overprint on the quartz vein.

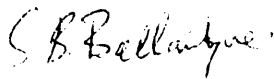
For the Atlin gold camp our investigations to date suggest that Au, Ag, As, Ni, Co, Bi, Sb, Te and Pb are consistently present in the gold bearing quartz veins and more locally intimately associated with gold depositional sites within the vein(s). Native gold (electrum) compositions are variable between veins yet some showings such as Monarch Mountain show within vein consistent fineness ranges even though the site of native gold precipitation may vary. Ore mineralogy between veins shows the above elemental association to persist as do the associated minerals but their minor trace elemtn compositions often change. The Monarch Mountain - Anna claim trench showing is at the highest elevation of the mineralized samples examined to date. It has the highest fineness and is the most homogeneous in composition.

The Atlin gold camp has strong similarities to the Motherlode District styles of mineralization, genesis etc. The placer gold of Atlin has morphology and compositional-variability comparable to the host lodes. Therefore the large nuggets of Atlin must be considered as "bonanza" "pocket" gold concentrations which are from the host veins. In the Motherlode "in situ" large masses of crystallized gold 6" x 13" weighing 67 troy ounces (5½ pounds) were found in vugs or pockets (see attached photo). A large gold leaf (5" x 6") or octahedral crystals (2' x 2") may easily be rolled and hammered into the larger nugget shapes often found in Atlin placer operations (see attached photos). Most of the large Atlin nuggets contain gangue (quartz) and some here at the GSC actually show gold around quartz vugs (pockets). Thus, it would seem reasonable that in the Atlin camp gold can be found in the sizes and concentrations exposed in the outcropping veins, however assays may be sporadic. These same veins however should contain "pocket" gold concentrations of museum quality as indicated by the size of the coarse nuggets.

Systematic exploration and prospecting should continue without discouragement with the understanding that bonanza pockets and vugs and intermittent native gold (electrum) concentrations associated with the described pathfinder elemental assemblage and mineralogy will be present in a sporadic distribution within the veins.

Assays, whole rock and trace element lithogeochemical results of samples from your properties are expected this summer. In the meantime, I wish to keep the visible gold samples you kindly gave me as more detailed work may be necessary.

Best wishes for a good field season.



S.B. Ballantyne

SBB/jb