Tom Schoultz
July 25/89

887461

THE SHEEP CREEK GOLD CAMP

by: John Murray
May 4, 1988

THE SHEEP CREEK GOLD CAMP

INTRODUCTION

The Kootenay Arc is a curving structural belt of early Paleozoic sediments flanked by the Mesozoic Nelson Plutonic belt on the west, and underlying late Pre-Cambrian Belt Supergroup quartzites and argillites to the east.

In the Sheep Creek camp these sediments are metamorphosed argillaceous quartzites of the Quartzite Range Formation, which is overlain by an argillaceous unit called the Reno Formation. The Quartzite Range Group is further subdivided into the Motherlode, Nugget, (and Navada members), and the whole assemblage has been tightly folded into two parallel north-south trending overturned anticlines with an intervening syncline.

A. Structure

The fold axes strike N8-12° E, and axial planes dip 50°E, (with much shallower dips at lower horizons), and they have a gentle plunge 5-10° to Sth. The whole package has been intruded by several granite stocks, an elongate swarm of quartz porphyry sills, and lamprophyre dikes.

The core of the western anticline, is the highly productive Upper Nugget Quartzite. The vertical range through which vein fractures are known to occur exceeds 1400 m, with individual veins extending to depths of up to 600 m within these fractures.

Because the core of the western anticline is the Navada-Nugget member, (which is the most productive), its crest defines the upper limit of the productive horizon. Both anticlines plunge gently to the south, and so of course does the productive horizon. The Navada rocks, (sometimes grouped with the Nugget member), are last seen at an elevation of approximately 4700' in the southern end of the camp, and the Nugget rocks are last seen about 3800' elevation.

B. Ore Hosts

The veins tend to be found in NE trending faults where they intersect particular stratigraphic units of the Quartzite Range Formation as the faults cross the axes of the two anticlines.

The veins are most productive in the quartzite members, although the Reno Mine carried ore in conspicously metamorphosed argillite.

The principal ore hosts are the Upper Navada Quartzite, the Lower Navada argillite, and, (best by far), the Upper Nugget massive quartzite. [The Middle Nugget argillaceous quartzite, Lower Nugget argillite, and Motherlode massive quartzite all hosted ore on the eastern anticline, but not on the west]. The different beds grade into each other with indeterminate contacts.

The ore zones occupy shear fractures whose north wall in every case has moved east relative tothe south wall, by as much as 160 feet and 130 feet on the Yellowstone and Queen respectively; much less on more northerly veins. Vertical movement is unknown. Generally speaking, the veins dip vertically, or steeply south.

Where veins of similar transverse faults occur in the overlying Laib limestone, (as at the Sumit), considerable replacement has occurred with much higher lead and zinc content, and the high-grade ore is narrower. By far the majority of the lead and zinc mined in the camp came from the Ore Hill mine, adjacent to the Sumit."

C. Veins

Vein widths are extremely irregular, ranging from 6" up to 7', and have been as high as 10' in the Queen Mine. For substantial portions of some faults quartz veining may be absent altogether. Ore occurs in localized shoots within the vein fractures, and large segments of vein ore often uneconomic.

Veins are predominantly milky white quartz, often difficult to distinguish from the enclosing quartzites. In general the vein fractures strike more nearly east at depth, and Mathews, (1955), observed that within favourable wall rocks, and within the favourable depth zone, those parts of

veins striking most nearly east are most likely to be ore-bearing. He also noted that ore-bodies tend to be wider where the strike of the fault is more easterly than usual; however, grade decreases with depth, and with increasing width.

Veins have a distinct regularity within the camp, and fall into 2 groups:

a) minor veins which often contain up to 40-50,000 tons; and

b) major veins generally containing 200,000-250,000 tons.

Both major and minor veins occur at regular intervals throughout the camp. (Where irregularity is noted it is probably a result of lack of data). Vein faults are known to occur at regular intervals of less than 500 feet from Reno Mountain in the north to at least Mount Waldie in the south. In the Sheep Creek Mine on the western anticline at least 12 faults are known over a 4500' distance, of which 10 were ore-bearing. The strike of these fractures can vary from 50-90° E, with these numbers being exceeded only rarely for short distances.

D. Mineralization

Mineralization is quartz veins with minor sulphides. The sulphides are pyrite, galena and sphalerite. Pyrite is the most significant sulphide, occurring in sub-parallel stringers, and coarse disseminated sphalerite, galena, pyrrhotite

and traces of chalcopyrite also occur, as do occasional traces of scheelite and indium.

Gold is very fine-grained, usually no more than 30 microns in diameter, and normally best gold values occur where base metal grades are high, but galena and sphalerite are present in commercial quantities only where the veins are in limestone.

The original discovery in the camp took place near the turn of the century and total production form 1900 to 1951 was 1,715,875 tons grading 0.43 oz/ton gold, (with minor silver, lead and zinc values). It is interesting to note, also, that the very high silica content of these ores has been an asset in that credits have been earned at the Cominco smelter in Trail where it is valuable as flux in their smelting operation.

John Murray

REFERENCES

1. Geology and Economic Minerals of Canada,, GSC 1968, edited by R.J.W. Douglas.

2. Notes on Goldbelt, C.Sampson, 1982.

3. Sheep Creek Gold Mining Camp, Cimm, Vol XLV 1942, pp 169-190; R.A. McGuire

4. BCDM 1917 Mem 172.

5. BCDM 1910, p.111

6. Brinex Report on Goldbelt Mine, 1980, Lyn/Cowpery.

7. Geological Report on Goldbelt Mine, R.J. Beaty, 1980

8. Geological Notes Nelson west Half Map Area, H.W. Little, O.F. 1195.

9. Summary Report on Nugget Mines Property, D.G. Allen, 1985

10. Summary Review of Nugget Property, G. MacDonald, 1985.

11. Geology of the Amco Gr., Sheep Creek, W.W. Moorhouse, 1952. A.R. 82.

12. Geology of the Sheep Creek Camp, BCDM Bulletin 31, W.H. Mathews, 1953.

13. Sumit, Amco 7, Amco 9, Amco 11, Amco 12, Amco 15, Amco 37 Fr., Amco 38 Fr. and Amco 39 Fr; R.H. Mayes, 1983.

14. GSC Map 1145A.

TABLE 5 SEDIMENTARY UNITS

Correlation of Sedimentary Rocks

Walker (1934)	McGuire (1942)	Mathews (1950)	Park and Cannon (1943)
Pend d'Oreille series: Lower part.	Pend d'Oreille series:	Laib Group (1,000 ft.+).[a]	
Reno formation.	Reno series: Reno argillite.	Reno formation (50 to 900 ft.).[a] Upper Reno. Lower Reno.	Mallien phyllite.
Quartzite Range formation.[1] (Quartzite 2,600 ft.)	Reno quartzite. Reno argillaceous quartzite.	Quartzite Range formation (2,000 ft.±).[a] Navada member: Upper Navada. Lower Navada.	
(Argillaceous member 200 ft.)[1]	Nugget series: Nugget quartzite. Nugget argillite.	Nugget member (540 to 900 ft.): Upper Nugget. Middle Nugget. Lower Nugget.	Gypsy quartzite.
(Massive white quartzite 1,600 ft.)[1]	Motherlode series: Motherlode quartzite. "Basal" argillites.	Motherlode member (1,000 to 1,100 ft.): Upper Motherlode. Middle Motherlode. Lower Motherlode.	
Three Sisters formation.		Three Sisters formation (500 ft.+).[a]	

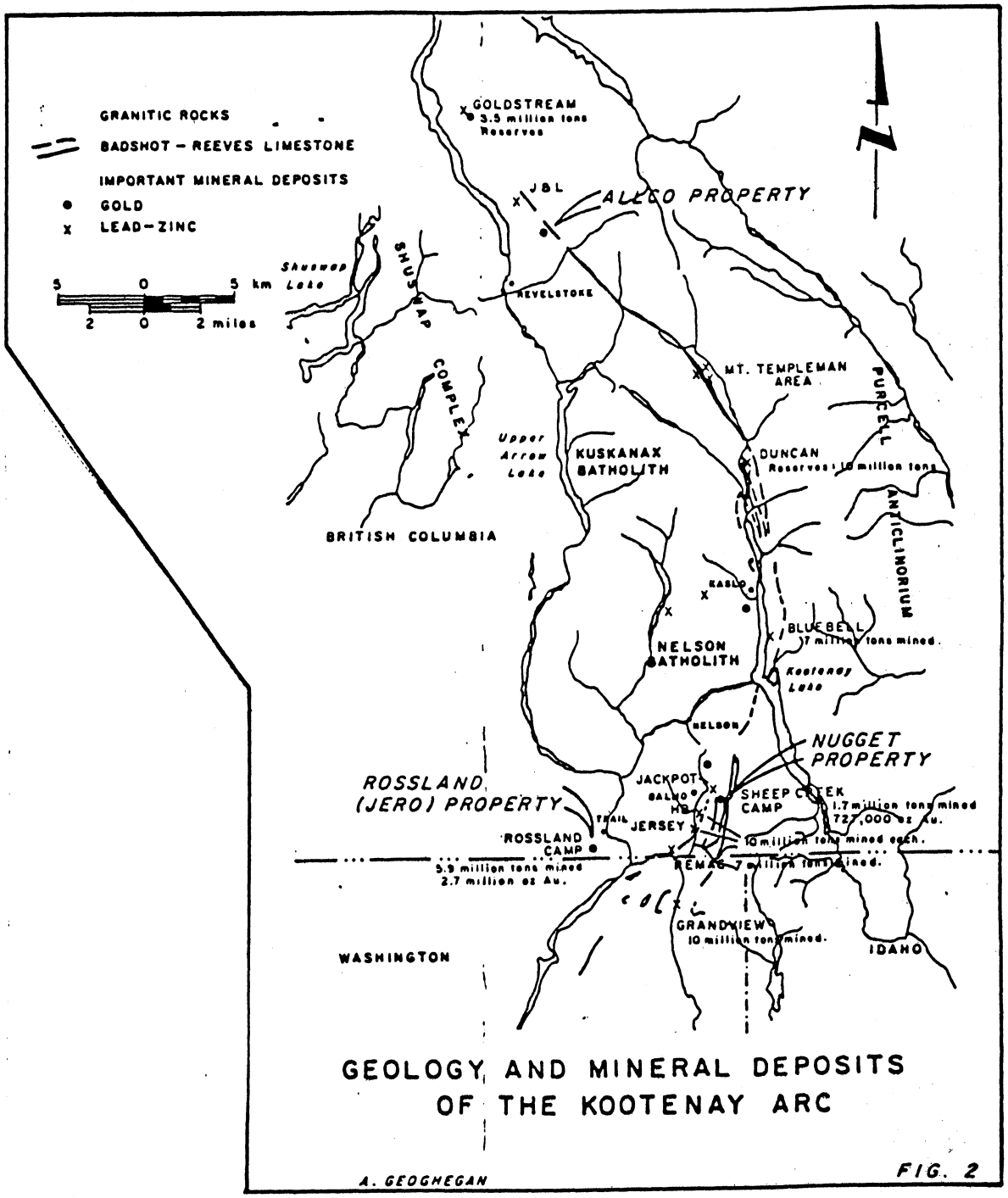
[1] Thickness in the type locality, 3 miles east of the Sheep Creek camp.
[a] Thickness or range of thickness in or adjacent to the Sheep Creek mines.

Table of Formations

Age	Formation			Lithology	Thickness in Feet	
Lower Cambrian	Laib Group			Argillite.	200[1]	1,000+[1]
				Grey limestone.	150[1]	
				Argillaceous in some localities, elsewhere dominantly calcareous.	300–500[1]	
				Limestone and argillite.	150–300[1]	
				Argillaceous beds, biotitic and amphibolitic schists.	100–300[1]	
				Limestone.	0–40[1]	
Precambrian (?)	Reno Formation	Upper Reno		Impure dark bluish or greenish quartzite with some grit beds.	125[a]	50–900[1]
		Lower Reno		Argillite, argillaceous quartzite.	450±[a]	
	Quartzite Range Formation	Navada Member	Upper Navada	Massive white quartzite.	20–160	120–300
			Lower Navada	Dark, thin-bedded quartzites and argillaceous quartzites.	100–140	
		Nugget Member	Upper Nugget	Massive white quartzite.	135–375	540–900
			Middle Nugget	White, grey and dark quartzites, dark argillaceous quartzites, and argillite.	175–300	
			Lower Nugget	Argillite and dark argillaceous quartzite.	150–225	
		Motherlode Member	Upper Motherlode	Massive white quartzite.	370–450	1,000–1,100
			Middle Motherlode	Argillite, grey grit and green schist.	50	
			Lower Motherlode	Massive white quartzite.	500–700	
	Three Sisters Formation			Grey grit, white quartzite and grit and green schists.		500+[1]

[1] Thickness or range in thickness for the northwestern part of the camp, near the Reno mine.
[a] Average thickness from measurements near Reno mine.

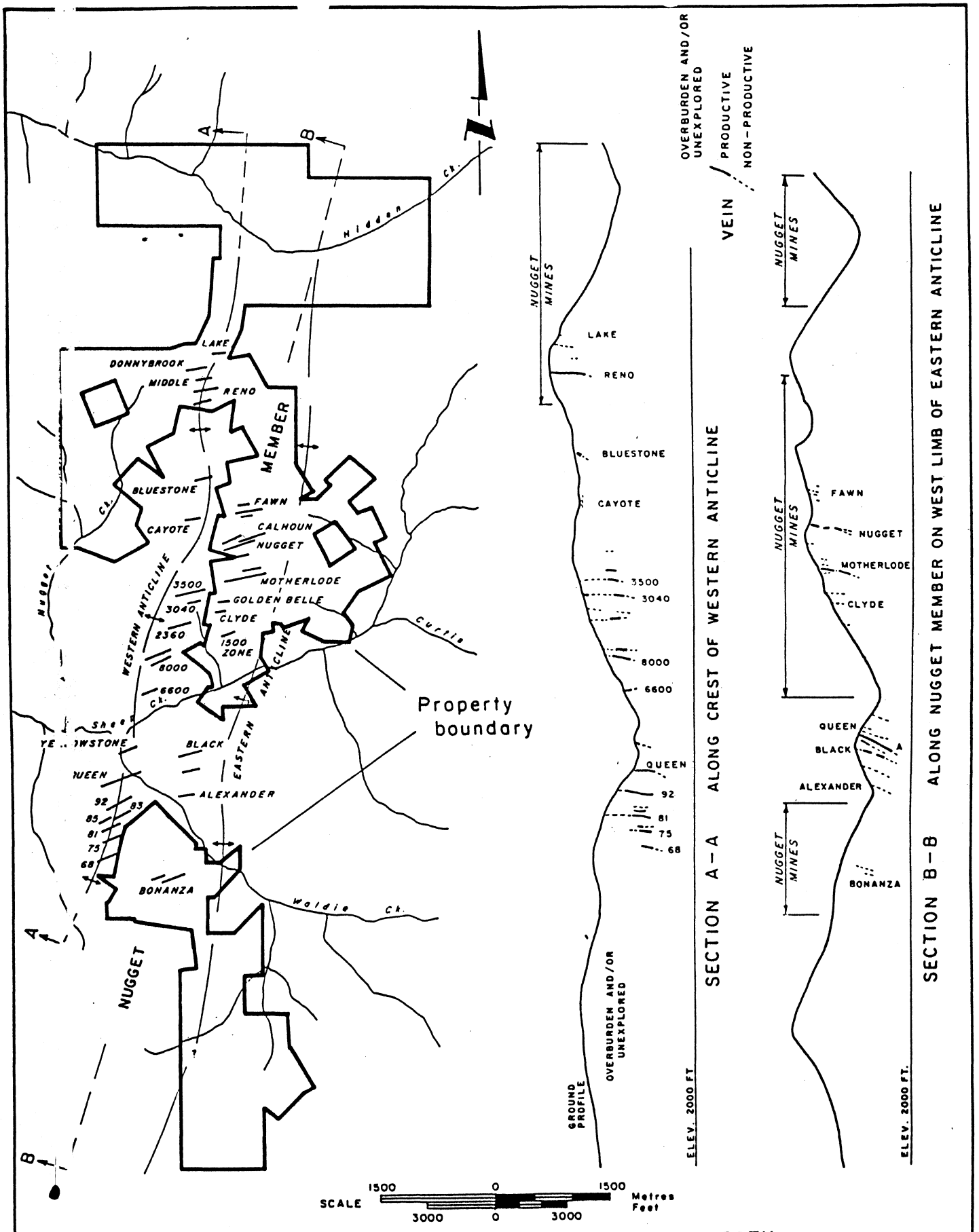
After Mathews (1953)



GEOLOGY AND MINERAL DEPOSITS
OF THE KOOTENAY ARC

A. GEOGHEGAN

FIG. 2



GUNSTEEL RESOURCES INC. – NUGGET PROPERTY

PLAN AND VERTICAL SECTIONS
SHOWING VEIN LOCATIONS

FIG. 3

...EOGHEGAN