

Lode Gold in the Cariboo: the Bonanza Ledge discovery of International Wayside Gold Mines

By David Rhys, Panterra Geoservices Inc.
(Abstract for talk at Roundup conference, January, 2001)

The Bonanza Ledge discovery represents a new style of high grade lode gold mineralization in the Cariboo gold district. The zone was discovered two km southeast of the past producing Cariboo Gold Quartz mine during drilling of the B.C. vein, a steeply northeast-dipping quartz vein from which several pyritic ore shoots were historically mined. The new zone is in the vein footwall, hosted by overturned, northeast-dipping metaturbiditic rocks and dolomite-sericite-fuchsite altered limestone of the Paleozoic Hardscrabble assemblage within the Barkerville terrane. Host rocks are polydeformed and affected by greenschist facies metamorphism. The dominant deformation phase, D2, is a Middle Jurassic event associated with overturned and northeasterly verging, tight to isoclinal folds that have northeast-dipping axial planar S2 foliation, and an intense, shallow northwest plunging composite intersection and elongation lineation (L2) which occurs at the intersection of S2 and older S1 foliation. Bonanza ledge is 300 m structurally deeper in the stratigraphic succession than other past producing lode gold deposits in the region, and consequently indicates the potential for mineralization outside areas that have been traditionally explored in the district.

Mineralization style, timing and associated alteration at Bonanza Ledge is broadly comparable to pyritic replacement style mineralization that was historically mined in the district, although the host rock differs, and the size of the Bonanza Ledge mineralized bodies is greater. Gold occurs in discrete areas of massive, banded and veinlet pyrite within a 20-100 m wide zone of intense, pervasive sericite-Fe-carbonate-pyrite alteration that is associated with bleaching of the host carbonaceous metasedimentary units. High grade pyrite mineralization has been traced by drilling over a strike length of 130 m. It is developed in areas locally more than 30 m thick comprising 10-70% of the rock as veinlets, concordant laminations and massive bands in gangue of muscovite, dolomite/ankerite and quartz. Au occurs as 2.5-60 μm native grains on fractures or grain boundaries of pyrite, often with chalcopyrite and galena, or encapsulated in pyrite. Grades typically range from 5 to 80 g/t Au. Sheeted, pale grey quartz veins and silicification that often occur adjacent to mineralization may represent proximal alteration. Gold bearing pyritic zones give way along strike and down dip to sets of pyrite-quartz-pyrrhotite-chlorite veinlets that contain trace gold concentrations; veinlet mineralogy and pyrite abundance can thus together be used to vector exploration.

Veinlets and pyrite bands in the Bonanza Ledge zones were tightly folded during D2, and some pyritic bodies and veins are elongated parallel to D2 fold axes. Although folded, the mineralized zone and enveloping alteration are discordant to stratigraphy. The zone may reflect one or more folded vein-like bodies that formed early during, or prior to D2. The presence of both relict sedimentary textures in zones of pervasive pyritization and discrete pyrite veinlets in the zone indicates that mineralization formed by a combination of replacement and veining.

Ongoing exploration in 2001 will evaluate the continuity of known mineralization and alteration, and test new targets generated by a recently completed program of geological mapping, soil geochemistry and ground geophysics. These include Au in soil anomalies associated with pyritic alteration in outcrop that is of similar style to Bonanza Ledge that occur in a similar stratigraphic position 2-3 km northwest of the new discovery. Emphasis will also be placed on targeting areas of D2 folding or north trending faults that coincide with Au in soil or geophysical anomalies -- structural targets that typically host, or are associated with deposits elsewhere in the camp.

The Cariboo Gold Project of International Wayside Gold Mines

By David Rhys, Panterra Geoservices Inc.
(Abstract for MEG talk, November 29, 2000)

The Cariboo Gold Project encompasses much of the core of the historic Cariboo Gold district in central British Columbia. Since gold was discovered in the area in 1860, the belt has produced more than 81 tonnes of placer gold and 37 tonnes of lode gold.

The project area is underlain by a northeast dipping sequence of metamorphosed Paleozoic clastic sedimentary rocks and limestone of the Barkerville terrane. At least three phases of Jurassic deformation affect the area. The dominant phase, D2, is associated with overturned and northeasterly verging, tight to isoclinal folds that have northeast-dipping axial planar S2 foliation. An intense, shallow northwest plunging composite intersection and elongation lineation (L2) occurs at the intersection of S2 and older S1 foliation, and is parallel to D2 fold axes.

Almost all lode gold production in the belt has been obtained from the Cariboo Gold Quartz, Island Mountain and Mosquito mines. Together, they define a single mineralizing system that is developed over a 4.5 km strike length within Wayside's Cariboo Gold project area. Gold mineralization exhibits both strong structural and stratigraphic control, and is developed within 150 m of the overturned contact between interbedded quartzite, sericite phyllite and limestone of the Downey succession to the northeast ("Baker" unit in mine terminology), and carbonaceous metaturbidite rocks of the Hardscrabble succession to the southwest ("Rainbow" unit). Mineralization is of two varieties that occur together in a broad zone of Fe-carbonate-sericite alteration:

(i) Replacement ore comprising small (500-40,000 tonnes), folded, northwest plunging rod-like bodies of massive, fine-grained pyrite > Fe-carbonate + quartz that replace limestone bands at the structural base of the Downey succession. Ore shoots plunge parallel to axes of, and are spatially associated with, mesoscopic D2 folds, particularly where they are intersected by northeast-dipping S2-parallel shear zones. The bodies are enveloped by sericite +/- Fe-carbonate alteration and silicification.

(ii) Quartz > pyrite veins comprise east-west trending, steeply dipping sinistral shear veins and coeval northeast trending quartz extension veins that form complex vein networks. A progressive sequence of veining is apparent that spans D2, from early, deformed veins to younger, least strained veins that contain most of the gold. Concentrated zones of veining are developed within the Hardscrabble assemblage where north-trending, late D2 dextral faults cross the Hardscrabble-Downey contact. Based on drilling by International Wayside and previous operators at two of these zones at the Cariboo Gold Quartz mine on Cow Mountain, an inferred resource of 7.9 million tonnes grading 2.03 g/t gold has been independently calculated (June 2, 2000 press release).

Although the two styles of mineralization are distinct, they may represent part of a single long-lived, syn-metamorphic, and syn-deformational Jurassic mineralizing event. Evidence includes the spatial association of both styles of mineralization, association of replacement bodies with D2 folds, the progressive sequence of syn-deformational quartz veining, comparable alteration assemblages that are compatible with metamorphic mineralogy, the

occurrence of some replacement zones as envelopes to quartz veins in limestone, and similarity of the Pb isotopic signature of both mineralization styles.

In March 2000, a new style of mineralization, the Bonanza Ledge zone, was discovered two km southeast of the Cariboo Gold Quartz mine during drilling of the B.C. vein, a steeply northeast-dipping quartz vein from which several pyritic ore shoots were historically mined. The new zone is in the vein footwall, hosted by overturned, northeast-dipping metaturbiditic rocks and dolomite-sericite-fuchsite altered limestone in the Hardscrabble assemblage 300 m structurally below its upper contact.

Mineralization style, timing and associated alteration at Bonanza Ledge is broadly comparable to the replacement style, although the host rock differs, and the size of the Bonanza Ledge mineralized bodies is greater. Gold occurs in discrete areas of massive, banded and veinlet pyrite within a 20-100 m wide zone of intense, pervasive sericite-Fe-carbonate-pyrite alteration that is associated with bleaching of the host carbonaceous metasedimentary units. High grade pyrite mineralization has been traced by drilling over a strike length of 130 m. It is developed in areas locally more than 30 m thick comprising 10-70% of the rock as veinlets, concordant laminations and massive bands in gangue of muscovite, dolomite/ankerite and quartz. Grades typically range from 5 to 80 g/t Au. Au occurs as 2.5-60 μm native grains on fractures or grain boundaries of pyrite, often with chalcopyrite and galena, or encapsulated in pyrite. Sheeted, pale grey quartz veins and silicification that often occur adjacent to mineralization may represent proximal alteration. Gold bearing pyritic zones give way along strike and down dip to sets of pyrite-quartz-pyrrhotite-chlorite veinlets that contain trace gold concentrations; veinlet mineralogy and pyrite abundance can thus together be used to vector exploration.

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A program of geological mapping, soil geochemistry and ground geophysics has recently been completed in the Bonanza Ledge area. Mapping along strike has demonstrated the continuity of alteration, and identified new, parallel alteration zones near the discovery. Outcrop exposures of pyritic sericite-carbonate alteration in a similar stratigraphic position to Bonanza Ledge have been located 2-3 km to the northwest, corresponding with a 1.2 km long Au in soil anomaly, demonstrating the potential for Bonanza Ledge style of mineralization for at least 3 km to the northwest. The 2001 program will evaluate these and any new targets, with emphasis placed on testing the continuity of known mineralization/alteration, and targeting areas of D2 folding or north trending faults that coincide with Au in soil or geophysical anomalies. Reconnaissance mapping and prospecting of the other portions of the extensive land holdings of the company is also planned, with priority placed on areas containing productive placer creeks.