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## BASE METAL DEPOSITS IN THE LIBBY PONDAGE RESERVE AREA (82G/SW, NW)

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### INTRODUCTION

A land-use study of the Rocky Mountain Trench between Fort Steele and the United States border (Fig. 36) is underway. The goal of the study is effective management of Crown land in the Libby Pondage Reserve following removal of the reserve. As part of the resource evaluation of the region the author investigated several mineral deposits and showings in the study area. All are small vein-type sulphide deposits hosted by Helikian sedimentary rocks of the Purcell Supergroup. Two (Burton and Empire-Strathcona) were small producers earlier this century, while one (Bull River mine) was operated recently.

### BULL RIVER MINE

Bull River mine, which was operated by Placid Oil Company between October 1971 and June 1974, is located 7 kilometres upstream from the settlement of Bull River. Over 524 000 tonnes of ore was mined, grading 1.46 per cent copper, 0.232 gram per tonne gold, and 11.7 grams per tonne silver. Two pits were excavated, each on a different vein. Several other mineralized zones are also reported on the property.

Chalcopyrite occurs as irregular blebs and fracture fillings along with disseminated pyrite and pyrrhotite in quartz-siderite veins and veinlets. Malachite and azurite coat fractures in both vein material and country rock. These veins are concentrated in highly fractured and sheared zones in dark grey laminated argillites and quartzites of the Aldridge Formation. The sedimentary rocks are characterized by bands rich in fine, well-crystallized pyrite. The mine area is intersected by basic dykes, which are spatially related to the mineralization (McMechan, 1979a). Host rocks dip roughly 25 degrees to the northeast, although structural deformation is prevalent in the pit areas. Mineralized zones dip steeply to the south.

### EMPIRE-STRATHCONA

This deposit, located north of Sand Creek 6 kilometres from Galloway, was developed between 1898 and 1900, and again in 1929 and 1930. Small quantities of high-grade ore were shipped in 1937.

In common with Bull River mine, the Empire-Strathcona deposit is a siderite-quartz vein (in this case with hematite) in dark grey, well-laminated Aldridge Formation argillites. Strata here dip 45 degrees to the northeast, and the vein itself dips 50 degrees to the southwest. The vein, as viewed in two open cuts, is 1.5 to 2 metres in thickness and contains a pure siderite band up to 1 metre thick. It occupies a prominent shear zone which includes 1-metre zones of schistose rock on both walls of the vein. Mineralization consists of sparse irregular blebs and fracture fillings of chalcopyrite and disseminated pyrite. Empire-Strathcona ore also contained significant quantities of silver.

## BURTON

The Burton, located 4 kilometres north of Elko, is a vein deposit hosted by argillites and quartzites of the Roosville Formation, the youngest Purcell strata in the region. Roosville rocks have pronounced red and green colourations and include dark stromatolitic dolomite bands. The Burton vein is predominantly composed of quartz, with small amounts of calcite and siderite, and is vertical and trends northeast. Mineralization, which is sparse in outcrop, consists of small disseminated patches of chalcopyrite. Malachite staining is common on fracture surfaces within and adjacent to the vein.

Two adits were developed at the turn of the century, the uppermost of which intersected high-grade material. Ore was shipped to Trail in 1916 and 1917. Silver values were apparently low.

## SWEET MAY AND JENNIE

These showings are within a few hundred metres of each other on Sheep Mountain, 6 kilometres south of Elko. Development took place at the turn of the century, but was not long lived.

The showings occur in shear zones adjacent to both contacts of a 10-metre-thick K-feldspar porphyry sill. Bedding in Purcell-age Gateway Formation carbonates is vertical and trends north-south. Both showings consist of scattered blebs of chalcopyrite in thin quartz veins. In general Sheep Mountain is host to many small quartz veins, some of which contain sulphide minerals.

## BURT

The Burt showing is less than 1 kilometre south of the Empire-Strathcona. Two adits and several trenches were excavated in the 1930's, but very little outcrop is visible now. Float found consists of vein quartz with small stringers of galena, which apparently contained appreciable silver. The vein is reportedly 0.7 metre thick and can be traced for 600 metres. Basic dyke material and Aldridge Formation sedimentary rocks are the host rocks (*Minister of Mines, B.C., Ann. Rept., 1937, p. 41*).

## CONCLUSIONS

Small vein-type base metal deposits are common in Helikian Purcell Supergroup sedimentary rocks in the vicinity of the southern Rocky Mountain Trench (*see Mineral Inventory Maps 82G/SW and 82G/NW, B.C. Ministry of Energy, Mines & Pet. Res.; Höy, 1978; Grieve and Höy, 1979; McMechan, 1979b*). In some cases they are spatially related to small intrusive bodies.

In view of the potential for economic mineral deposits, areas underlain by Purcell Supergroup sedimentary rocks within the Libby Pondage Reserve should remain accessible for exploration and development.

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