CK PROSPECT
SHUSWAP METAMORPHIC COMPLEX
(82M/13E)

By T. Höy

INTRODUCTION

The CK property includes a number of lead-zinc showings apparently confined to one stratigraphic layer. It is located between Ritchie Creek and Raft River, 37 kilometres north of Vavenby. The area is accessible by a well-maintained logging road branching north from Highway 5, 3 kilometres east of Clearwater and following Raft River.

The Main Boulder and part of the New showings were discovered by Andy Horne, the present owner, in 1973 and optioned by Rio Tinto Canadian Exploration Limited in 1974. A regional soil sampling program by Rio Tinto in 1974 led to the discovery of a massive sulphide exposure, the North showing, and outlined an anomalous zone in the New showing and Main Boulder area. The North showing was explored by geophysical methods and subsequently drilled. Four short holes in the Main Boulder area and one in the New showing failed to intersect significant massive sulphide mineralization (Assessment Report 5192). Two additional holes in the North showing intersected some lead-zinc mineralization; the better assayed intersection returned 3.98 per cent zinc, 0.71 per cent lead, 0.01 per cent copper, 0.18 ounce per tonne silver, and 0.007 ounce per tonne gold over an approximate 1-metre thickness (Assessment Report 5631).

Cominco Ltd. optioned the property in 1978 and carried out geochemical and geophysical surveys and trenching which led to the discovery of mineralized exposures in the Main Boulder, New, and Mist areas. The company drilled 20 holes in 1978 and an additional 18 in 1979. This drill program concentrated on the New showing and to a lesser extent on the Main Boulder showing.

Five days were spent on the property in August 1979, visiting the showings and logging the core drilled to that time (drill hole 79-12). During this time I was cheerfully assisted by Peter Mustard. The co-operation and hospitality of Cominco Ltd. is gratefully appreciated. Access to its maps and reports proved most useful, and discussions with Mike Murrel, G. Benvenuto, and Fred Gill were both stimulating and informative.

GEOLOGY

The area is underlain by metasedimentary rocks of the Shuswap Metamorphic Complex (Campbell, 1963). These include quartz feldspar-hornblende gneiss, amphibolite, calc-silicate gneiss and minor quartzite, and marble of unknown but probable Paleozoic age. Pegmatite is abundant. A fine to medium-grained granitic intrusive rock is present in the west part of the area (Fig. 6, personal communication, G. White).

The general succession in the area includes well-layered hornblende gneiss and amph bolite exposed in canyons in the creek west of Raft River (Fig. 6) which are structurally overlain by a calcareous succession that includes the sulphide layer, and then by a quartz feldspar gneiss and pelitic schist succession exposed in scattered outcrops on the hills east of the New showing (personal communications with Cominco geologists). The Main Boulder showing is assumed to be the same sulphide layer that occurs in the New showing, inferring the presence of a fault in the creek separating them.

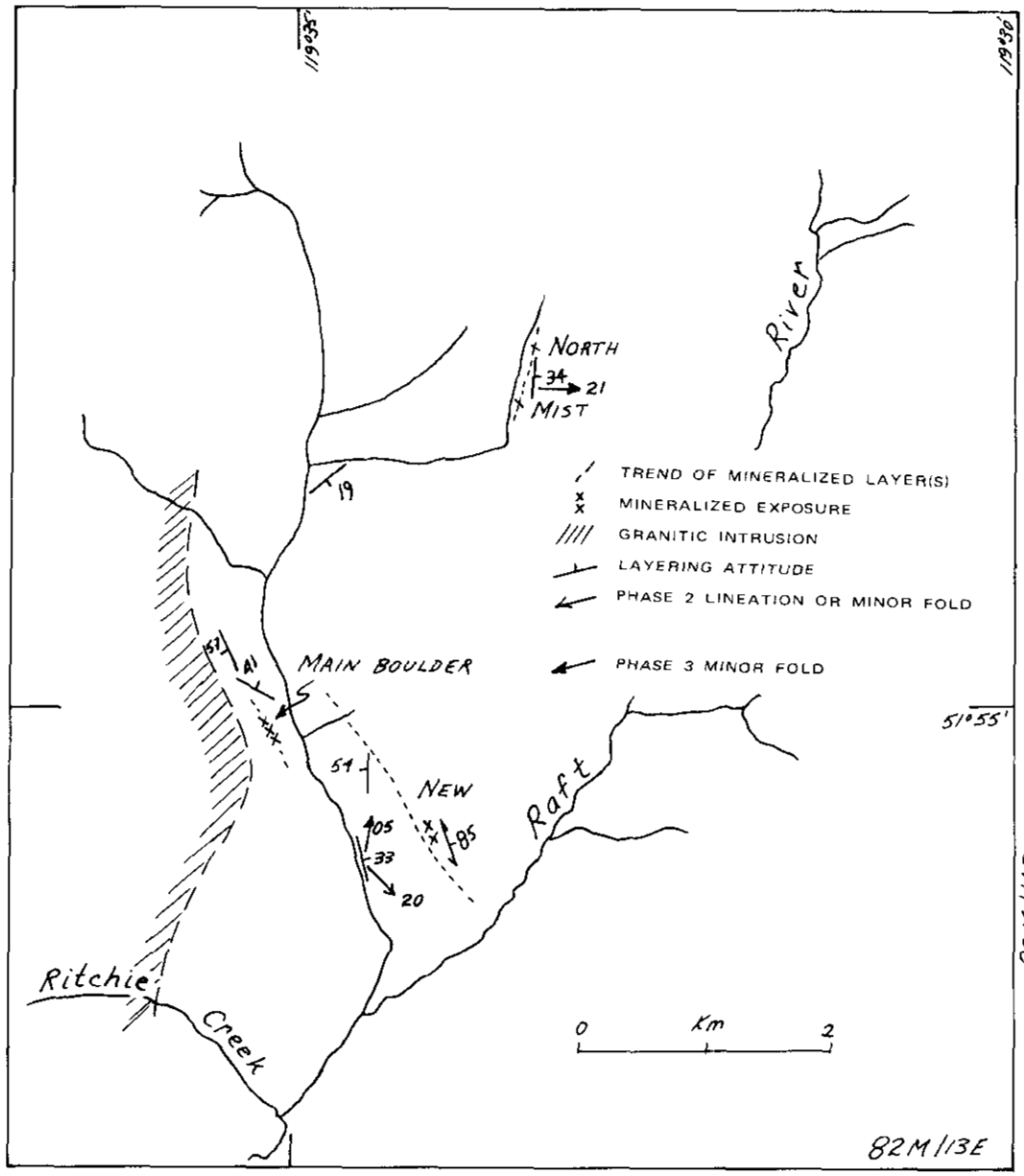

Figure 6. Location map showing mineralized exposures and trends of CK mineralization (after Cominco Ltd.), and some structural data (this report and unpublished data from G. White).

The general structure of the area appears to be relatively simple with an east-facing succession folded into a broad open, east-plunging (phase 3 ?) synformal structure with the New showing trending southeast on the southern limb and the North and Mist trending northeasterly on the northern limb. However, at outcrop scale and drill-section scale structures are very complex resulting in local dip reversals and repetition and omission of lithologies. These complexities are due primarily to relatively late (phase 2 and phase 3) folding and late faulting. Minor folds related to the late (phase 3 ?) structure have upright axial planes and plunge variably to the east and west. Earlier, southeast-plunging (phase 2 ?) folds are noticeable at outcrop scale. They have a pronounced lineation parallel to their fold axes, are relatively open to quite tight, and postdate the regional metamorphism. These folds are responsible for the flattening and apparent thickening of the sulphide layer at the New showing (*see* drill section, Fig. 7) and may be important elsewhere in locally thickening the sulphide layer. An earlier syn-metamorphic deformation (phase 1) is indicated by the parallelism of a regional foliation with bedding. Its effect on the distribution of lithologies is not known.

The calcareous succession structurally above the sulphide layer consists primarily of quartz-diopside calc-silicate gneiss invaded by abundant pegmatite (Fig. 7). In some drill sections, several relatively pure white marble layers up to several tens of metres thick, but generally considerably thinner, occur within this overlying succession. Micaceous schist and quartz feldspar gneiss are also common. Beneath the sulphide layers these schists and gneisses predominate and calc-silicate gneiss is relatively less important.

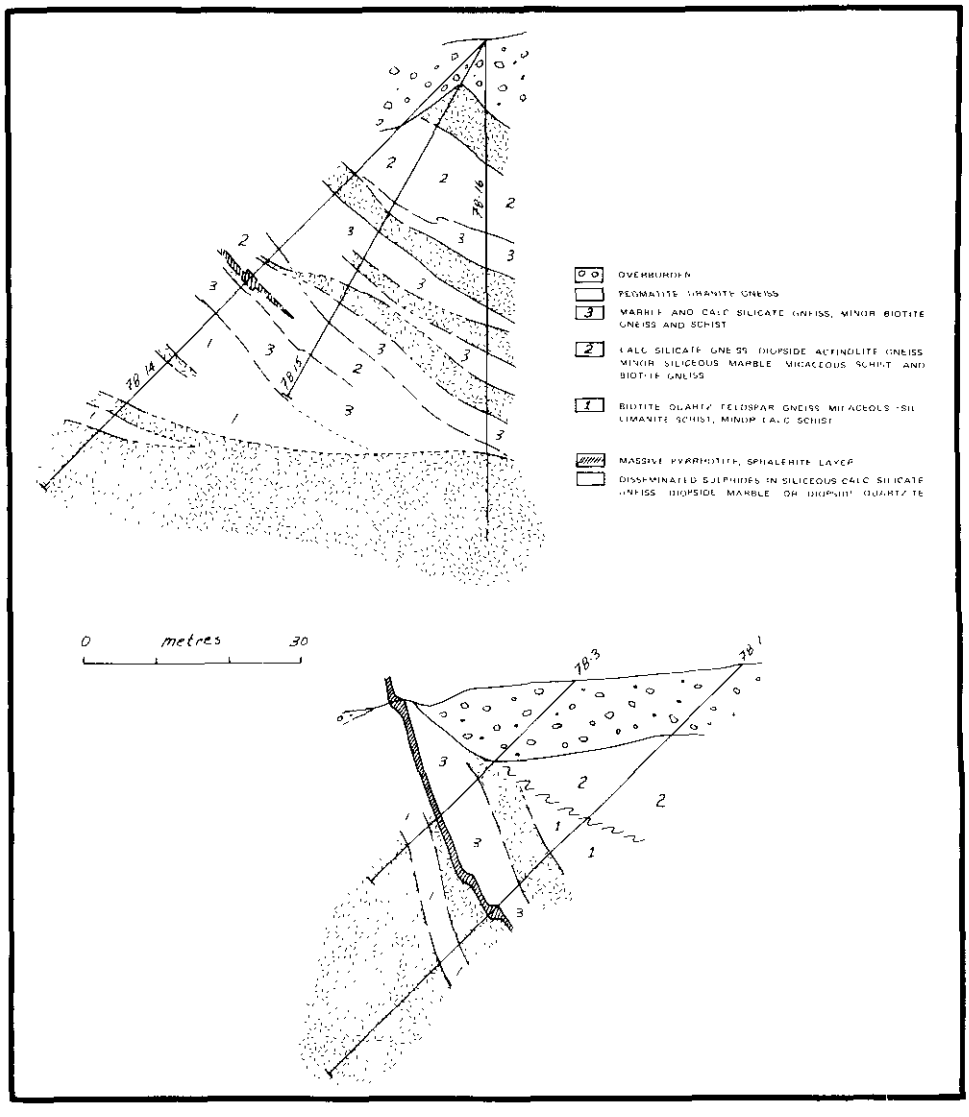

Figure 7. Vertical sections through drill holes CK 78-1, 78-3, 78-14, 78-15, and 78-16, New showing area, viewed to north. For location, *see* Figure 8.

The sulphide layer in the New showing is generally less than 1 metre thick and appears to be continuous, with perhaps minor structural breaks and offsets, for a distance of at least 1 300 metres from drill holes 78-8 to 78-19 (Fig. 8). It is also intersected in holes 79-11, 78-14, and 78-15, a further 800 metres to the north. It consists of massive sphalerite and pyrrhotite, minor galena, and trace chalcopyrite. Gangue quartz, diopside, calcite, amphibole, and plagioclase are common. Fluorite and vesuvianite occur locally. The contacts of the sulphide layer may be sharp or gradational through several metres of siliceous marble containing disseminated sphalerite and pyrrhotite. In a few holes a thin, well-layered diopside-bearing quartzite occurs structurally beneath the sulphide layer.

A 20 to 30-centimetre-thick sulphide layer at the North showing is on strike with a similar layer at the Mist showing several hundred metres to the southwest. Structural complexities at the Boulder showing hinder tracing a small trenched outcrop of massive sulphides for more than a few metres. It was not intersected in any of the holes drilled here.

Assays of both chip and grab samples of the sulphide layer and of a sample of mineralized marble from the Boulder showing are presented in the accompanying table. Average grades of the massive sulphide layer and immediate wallrocks reported by Cominco Ltd. range between 1 to 3 per cent lead and <5 to 15 per cent zinc. The lead/lead + zinc ratio varies from 0.1 to 0.2. Silver and gold are present in only trace amounts, copper varies from 0.02 to 0.057 per cent and cadmium from <0.01 to 0.025 per cent.

ASSAYS, CK PROPERTY

Showing	Sample Type	Pb	Zn	Fe	Cu	Cd
		per cent	*per cent*	*per cent*	*ppm*	*ppm*
Main Boulder	grab sample (1974)	1.45	5.8	------	<0.001	------
Main Boulder	grab sample (1974)	4.50	27.1	------	0.045	------
Main Boulder	grab sample	6.31	23.37	7.76	247	252
Main Boulder	0.6 metre chip	4.88	23.45	14.34	423	260
New	0.6 metre chip	4.19	25.20	12.24	408	255
New	0.6 metre chip	4.41	21.85	20.84	568	203
North	0.6 metre chip	0.81	8.95	19.44	515	87
Mist	0.6 metre chip	2.66	20.70	11.33	512	230

SUMMARY

Sphalerite, pyrrhotite, and minor galena occur in a massive sulphide layer generally less than 1 metre thick but locally may be several metres in thickness. This layer appears to be continuous for at least 1 300 metres and probably considerably further. Local structural complexities and lack of outcrop hinder tracing the layer between showings. Surrounding rocks include a dominantly calc-silicate gneiss, micaceous schist, and quartz feldspar gneiss succession, laced by pegmatite.

The CK showings are similar in many aspects to other Shuswap lead-zinc deposits. They are thin layers but commonly very continuous and occur in a calcareous and pelitic succession. Quartzite and marble, common associated lithologies in the Cottonbelt, Jordan River, and Big Ledge successions, are less common at CK and Ruddock Creek.

REFERENCES

B.C. Ministry of Energy, Mines & Pet. Res., Assessment Reports 5192 and 5631.
Campbell, R. B. (1963): Adams Lake, British Columbia, 82M/W, *Geol. Surv., Canada*, Map 48-1963.

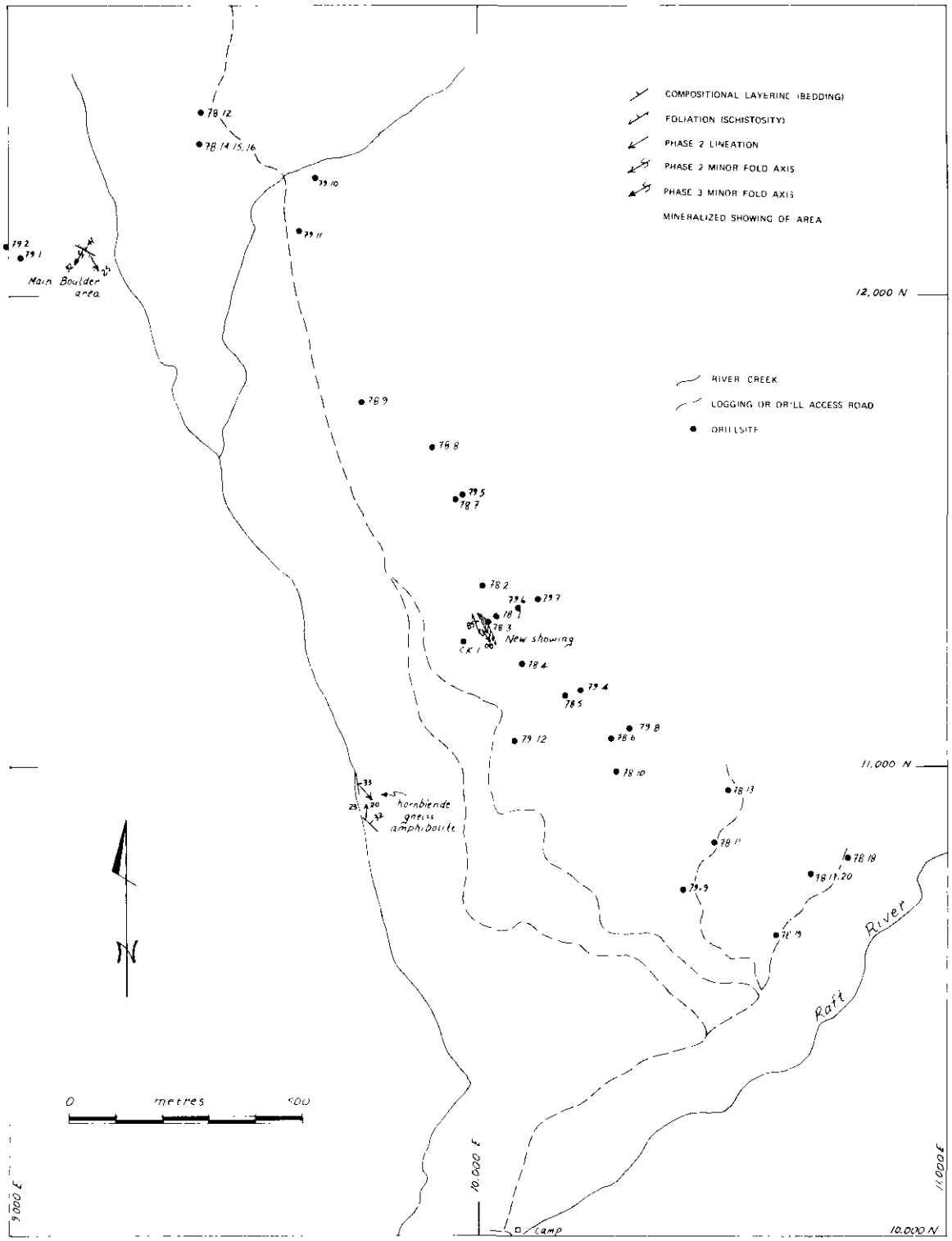

Figure 8. Drillsites in New showing and Main Boulder area (based after Cominco Ltd. data).