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STRATIGRAPHY OF THE ELK FORMATION IN SOUTHEASTERN BRITISH COLUMBIA

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The Elk Formation is the uppermost formation of the Jurassic-Cretaceous Kootenay Group (Gibson, 1979). It conformably overlies the Mist Mountain Formation, the host formation for economic coal seams in the southeastern British Columbia coalfields. It is overlain, generally unconformably, by the Cadomin Formation of the Blairmore Group.

Changes in the lithology and stratigraphy of the Elk Formation caused by rapid lateral facies changes in the Elk Formation away from and particularly east of the type section on Coal Creek render it less distinct from the underlying Mist Mountain Formation. A consistent definition of the Elk Formation and identification of a precise contact with the Mist Mountain Formation become increasingly difficult away from the type section. These problems prompted the authors to undertake a detailed analysis of the Elk Formation in the southern Fernie Basin area in an attempt to formulate a more consistent definition of the formation and to describe its variations. We attempt to identify the problems and to provide some practical guidelines for recognition of the Elk Formation.

FIELDWORK

Two weeks have been devoted to the study so far. Stratigraphic sections have been measured at Coal Creek (type section, Newmarch, 1953), Morrissey Ridge (reference section, Gibson, 1979), Flathead Ridge, and the Lodgepole property (McLatchie Ridge), all within the Fernie Basin.

In addition, drill-core from the Lillyburt property in the Flathead coalfield was logged.

Sections were measured using 'pogo stick' and chain.

STRATIGRAPHY

Elk Formation in the study area is an eastward-thinning unit of non-marine clastic sedimentary rocks including sandstone, siltstone, mudstone, local conglomerate, and coal. Clastic units are similar in terms of composition and sedimentary structures to those in the underlying Mist Mountain Formation.

Several lithological criteria aid in identifying the Elk Formation in southeastern British Columbia. These are: the abundance and distribution of coarse clastic material; the distinctive nature of Elk coal; the presence of needle siltstone; the relative scarcity of coal seams; and the absence of coal seams greater than about 1.5 metres in thickness.

A thin-bedded, dark grey to black, well-indurated, carbonaceous siltstone is a distinctive feature of the Elk Formation. It weathers a distinctive light grey colour, and where it is exposed to weathering the bedding surface is irregular and hummocky. This unit is informally called 'needle siltstone' because it contains fragments of needle coal (Gibson, 1977, p. 782).

Coal in the Elk Formation is of two main types. The more common is bright and vitrain-rich and occurs in thin lenticular beds that are generally less than 0.5 metre and nearly always less than 1.5 metres in thickness. It is indistinguishable in outcrop from some coal seams of the Mist Mountain Formation. The other coal type is a brittle and resistant cannel coal containing alginite, referred to by the authors as 'Elk coal.' A conspicuous variety of Elk coal, needle coal, consists of algal needles which resemble pine needles. Elk coal comprises thin, usually less than 0.3 metre, lenticular, discontinuous beds. These commonly directly overlie needle siltstone.

The contact between the Elk and Mist Mountain Formations is gradational. The prominent basal, cliff-forming sequence of conglomerate and sandstone units in the Coal Creek area (Newmarch, 1953) is a local phenomenon. Elsewhere, selection of a basal contact often involves a compromise, or an arbitrary placement. In these instances, the contact is not traceable for mapping purposes.

A more detailed discussion of the results of this ongoing study will be published at a later date.

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