# MOUNT BANNER AREA
# ELK VALLEY COALFIELD

(82G/15, J/2)

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## INTRODUCTION

The Mount Banner area is south of Ewin Creek in the southern portion of the Elk Valley coalfield (Figure 1), and adjoins the area investigated in 1980 (Grieve, 1981). Geological mapping was carried out to provide new data concerning structure, stratigraphy, and coal resources of the coalfield.

Coal rights in the study area are held in part by B.C. Coal and in part by Crows Nest Resources, and both companies are actively engaged in exploration. Proximity to developing mines at Line Creek (Crows Nest Resources) and at Greenhills (B.C. Coal), both are approximately 10 kilometres away, suggests that the study area is strategically located for future mine expansion.

Mount Banner is 10 kilometres east of Elkford, and is accessible from both the Fording mine road and the Line Creek minesite. Elevations within the area range from 1 500 to 2 600 metres.

## FIELD WORK

Data was plotted directly on British Columbia government air photographs and transferred to 1:10 000-scale orthophotos. Stratigraphic sections of the coal-bearing Mist Mountain Formation were measured using 'pogo stick,' chain, and compass. Coal outcrops, roadcuts, and trenches were grab-sampled for petrographic rank determinations. Channel samples were collected in certain areas to provide representative material for maceral analyses.

Results of petrographic studies will be published at a later date.

## STRATIGRAPHY

Sedimentary rocks of the Jurassic-Cretaceous Kootenay Group comprise the Elk Valley coalfield. The Kootenay Group, as defined by Gibson (1979), consists of the Morrissey, Mist Mountain, and Elk Formations.

The basal Morrissey Formation is a prominent, cliff-forming, medium-grained sandstone unit.

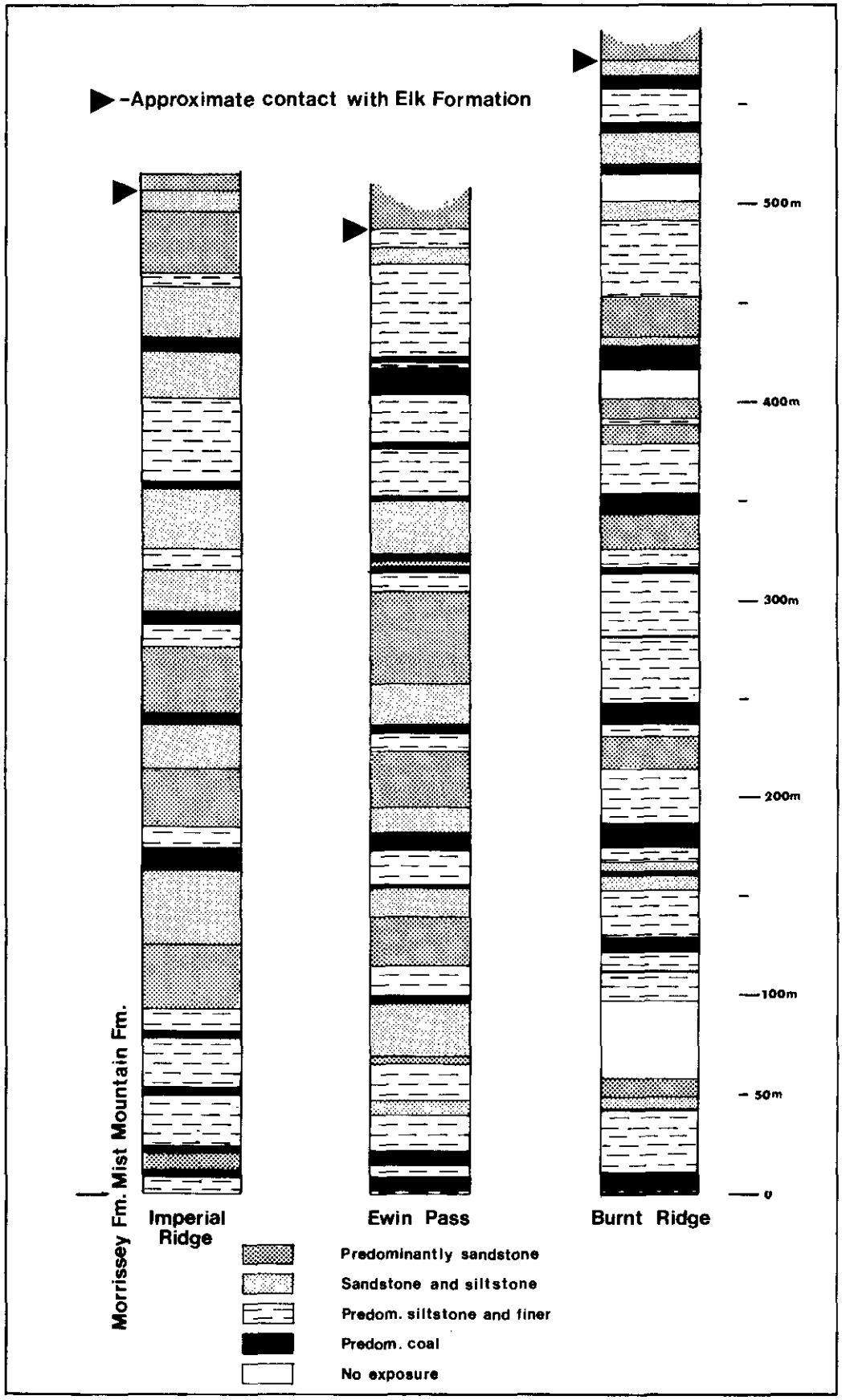


Figure 2. Generalized stratigraphic columns of the Mist Mountain Formation at Imperial Ridge, Ewin Pass, and Burnt Ridge. Coal seams thicker than 1 metre are not indicated.

The overlying Mist Mountain Formation consists of interbedded sandstone, siltstone, mudstone, coal, and minor amounts of conglomerate. It is on the order of 500 metres thick in the study area (Figure 2).

In this area the overlying Elk Formation includes an estimated 250 to 300 metres of strata which resemble those of the Mist Mountain Formation. However, coal seams in the Elk rarely exceed 1.5 metres in thickness. Other characteristics of the Elk Formation are described elsewhere in this paper.

The contact between Mist Mountain and Elk Formations is not readily identified in the study area. Generally the contact is placed either at the lowest occurrence of Elk coal, or at a locally mappable, resistant sandstone unit which appears to separate strata that are characteristic of the two formations. Because lateral transitions within the coarse clastics of the Kootenay Group are rapid, some inconsistencies occur.

Kootenay Group is overlain at two locations in the study area by conglomerate of the Cadomin Formation of the Blairmore Group (Figure 1).

## STRUCTURE

The north-south-trending Alexander Creek syncline is the dominant structure in the Elk Valley coalfield. In the Mount Banner area it is asymmetric with a steep west limb (Figure 1). Parallel smaller scale folds with similar geometry occur on the east limb and have the effect of bringing Mist Mountain Formation to the surface in the small drainage basin west of the Ewin Pass property (Figure 1).

Thrust faults are also important structural features in the Mount Banner area. The Ewin Pass (or Fording) thrust crops out on the east limb of the Alexander Creek syncline throughout the south half of the Elk Valley coalfield (Pearson and Grieve, 1980; Grieve, 1981). It is a west-dipping fault with at least one major splay in the Mount Banner area (Figure 1). Steeply northwest-plunging dragfolds (Figure 1) occur on both the hanging and foot walls. Its major effects were to emplace Mist Mountain over Elk Formation, especially south of Mount Banner peak and on Mount Michael, and to create an apparently excessive thickness of Mist Mountain Formation on the south side of Ewin Creek (Figure 1).

Several other thrust zones of lesser lateral continuity and small to negligible stratigraphic displacement occur on the east limb; three are noted on Figure 1.

The Burnt Ridge property, which is on the west limb, also contains a significant zone of faulting (Figure 1). Movement on this zone produced northwest-southeast-trending dragfolds, and a persistent zone of overturned, west-dipping strata.

Assuming that these overturned strata are in the footwall of an east-dipping fault, there are two possible explanations for their orientation:

(i) gravity movement toward the core of the syncline, perhaps along an earlier thrust surface; or (ii) early formation of the Ewin Pass thrust, with subsequent folding around the axis of the syncline. The second alternative implies that the fault on Burnt Ridge is part of the Ewin Pass thrust, and that the easterly dip and apparent normal movement were produced by the folding. This alternative is also consistent with the relatively large degree of stratigraphic displacement on the Ewin Pass thrust considering the proximity of the synclinal axis. This suggests that movement was initiated some distance further to the west. It may also be significant that dragfolds associated with the fault have a northwest-southeast trend, compared with the nearly north-south trend of the Alexander Creek syncline and associated minor folds.

Further work is required to test these two hypotheses.

## ACKNOWLEDGMENTS

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