

**GEOLOGICAL
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**DEPARTMENT OF ENERGY,
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**TRIASSIC STRATIGRAPHY OF THE BOW RIVER—
CROWSNEST PASS REGION, ROCKY MOUNTAINS
OF ALBERTA AND BRITISH COLUMBIA**

(Report and 2 figures)

D. W. Gibson

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SECTION



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ABSTRACT

The Spray River Group is divided into two distinct formations in the Bow River - Crowsnest Pass region of Alberta and British Columbia. The upper, Whitehorse Formation consists of light grey- to buff-weathering, calcareous and dolomitic sandstone with minor amounts of sandy to silty dolomite. The underlying Sulphur Mountain Formation, which is divisible into 4 members at most localities, comprises a sequence of dark grey- to brown-weathering siltstone, silty and sandy limestone, shale, and some dolostone.

This preliminary paper provides detailed information on the character, distribution, age, and stratigraphic relationships of Triassic rocks in southwestern Alberta and southeastern British Columbia.

TRIASSIC STRATIGRAPHY OF THE BOW RIVER - CROWSNEST PASS REGION,
ROCKY MOUNTAINS OF ALBERTA AND BRITISH COLUMBIA

INTRODUCTION

During the summer of 1967, several Triassic outcrop sections were measured and sampled in detail, in the Front Ranges and Foothills between the Bow River and Crowsnest Pass regions of Alberta and British Columbia. The study is an extension of, and concludes, earlier work begun in 1962 between Smoky and Brazeau Rivers (Gibson, 1968a, 1968b). This preliminary paper provides information on the character, distribution, age, and stratigraphic relationships of Triassic rocks in southwestern Alberta and southeastern British Columbia.

Complete and suitable stratigraphic sections were difficult to find because of intense folding, faulting, and generally poor rock exposure. Consequently, sections were examined and measured where any recognizable members or formations were present. Eleven stratigraphic sections are described in the appendix.

Acknowledgments

Able assistance was rendered in the field by D.K. McAlpine. The writer is grateful to officers and rangers of the Alberta and British Columbia Forest Service for their friendly co-operation and help, especially because hazardous forest fire conditions existed in the region when this field investigation took place. The writer also extends his appreciation to Crowsnest Industries for permission to use private logging roads along Elk River valley, and to R. Weaver for providing and assisting with horses on a trip to measure sections on Henretta and Forsyth Creeks.

All fossils collected in the field were identified by E. T. Tozer of the Geological Survey of Canada.

Previous Work

Bow River - Kananaskis Lakes Region

McConnell (1887), in a geological study of part of the Rocky Mountains near Banff, named a succession of reddish weathering shales and quartzites the Upper Banff Shales, and assigned to them a Carboniferous age. Dowling (1907), in a study of the Cascade Coal Basin, adopted the same name for the shales and quartzites, but he suggested a Permian-Triassic age for them. Lambe (1916), on the basis of fossil identifications obtained by E.M. Kindle, proved the Upper Banff Shales to be of Triassic age and Kindle (1924) subsequently renamed them the Spray River Formation. Warren

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(1927), described a section of the Spray River Formation in Spray River gorge near Banff and, in 1945, divided the Spray River Formation into two members, a lower Sulphur Mountain, and an upper Whitehorse, designating Spray River gorge as the type locality for the lower member. Those two members were subsequently elevated to formational status in the Jasper region by Irish and Mountjoy (1954, 1960), and this usage was extended into the Banff region by Barss et al., (1964). Allan and Carr (1947) described in detail the Triassic stratigraphy of the Highwood-Elbow area. A similar detailed study was made by Crockford (1949) in the Ribbon Creek area. Other investigations, which briefly describe or discuss the Triassic stratigraphy of the Bow - Kananaskis region, are included in papers by Clark (1948), Crockford and Clow (1953), Crockford (1956), and Barss et al., (1964).

Highwood River - Crowsnest Pass Region

MacKay (1932), during his investigation of coal deposits in the Crowsnest Pass region, discussed the occurrence of 350 feet of sandstones and shaly quartzites near Crowsnest station, that were of probable Triassic age. Telfer (1933), measured and briefly described 475 feet of Triassic strata north of Crowsnest Pass, and considered them equivalent to the Spray River Formation of the Banff region. Newmarch (1953), and Crabb (1957), briefly described Triassic strata during Cretaceous coal studies in the Crowsnest-Fernie area of Alberta and British Columbia. Norris (1958), Douglas (1958), and Price (1962, 1965), mapped and described Triassic outcrops in their respective areas.

STRATIGRAPHY

Previous work between Smoky and Brazeau Rivers (Gibson, 1968a, 1968b) resulted in redefinition and stratigraphic subdivision of the Sulphur Mountain and Whitehorse Formations. Most of these subdivisions are used in this report.

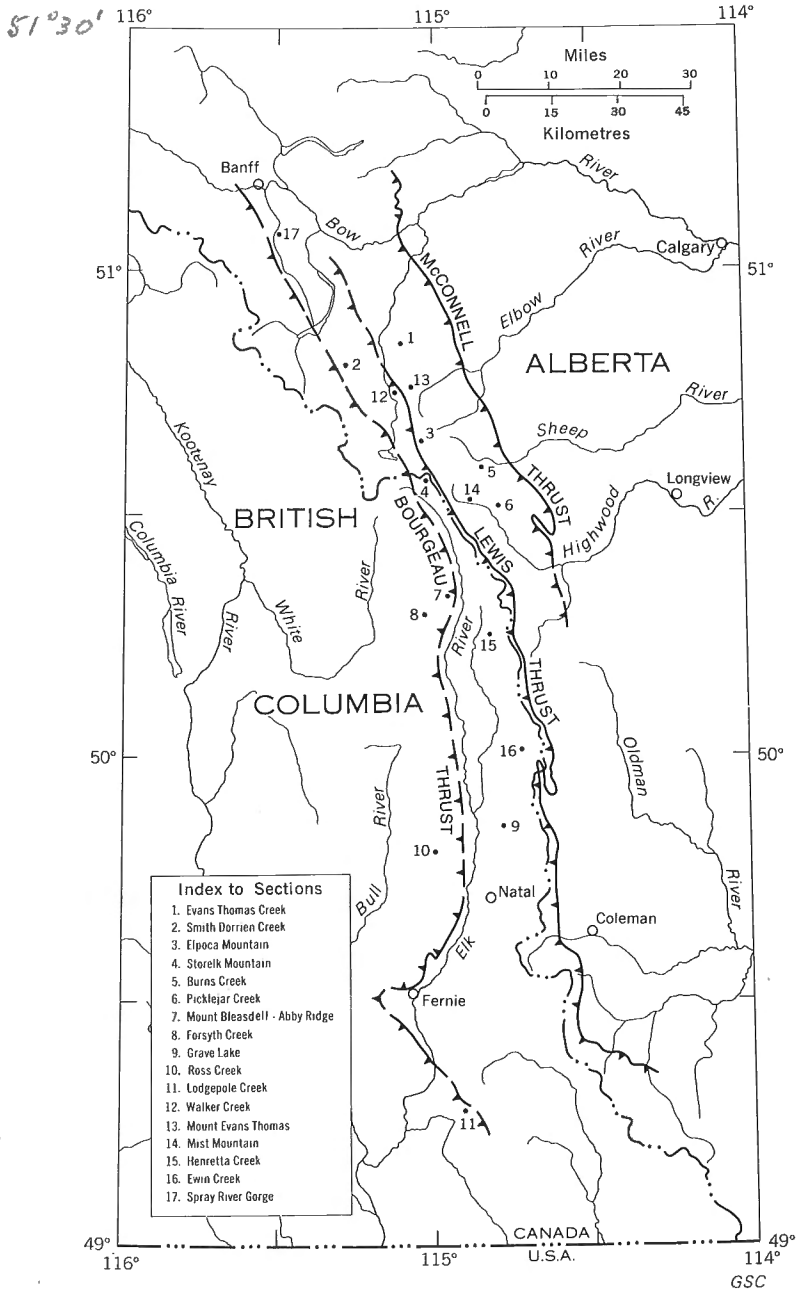


Figure 1. Index map showing location of sections

Table of Formations

Series	Formation and Thickness (feet)	Member and Thickness (feet)	Lithology
Jurassic	Fernie Formation		
Unconformity			
Middle or Upper Triassic	Whitehorse Formation (0 to 175)	Undivided	Calcareous to dolomitic sandstone and siltstone; minor sandy, quartzose dolomite, limestone, and collapse breccia
Middle Triassic	Sulphur Mountain Formation (285 to 1,680)	Llama Member (0 to 210)	Well-indurated dolomitic, quartz siltstone, and very fine-grained sandstone
		Whistler Member (0 to 45)	Shaly- to flaggy-weathering, dolomitic, quartz siltstone
Lower Triassic		Vega Siltstone Member (180 to 1,193)	Dolomitic to calcareous quartz siltstone, silty limestone, and shale; locally dolomitic sandstone, sandy to silty quartzose dolomite
		Phroso Siltstone Member (100 to 800)	Calcareous and dolomitic siltstone, silty shale, and minor quartz sandstone
Unconformity			
Permian	Ishbel Group		

Spray River Group

Spray River strata in the Foothills and Front Ranges of west-central Alberta and southeastern British Columbia are divided into two distinct stratigraphic units called the Sulphur Mountain and Whitehorse Formations. Throughout much of the present study-area in southwestern Alberta, however, the upper stratigraphic unit is eroded and, as a result, only the lower formation, Sulphur Mountain, is recognized.

The Spray River Group consists of siltstone, silty shale, limestone, dolomite, and sandstone, and varies in thickness from a minimum of 330 feet measured at Burns Creek in the McConnell Thrust Sheet, to a maximum of 1,715 feet at Abby Ridge in the Bourgeau Thrust Sheet (Figure 1). The Triassic succession unconformably overlies chert, cherty dolomite, and sandstone of the Permian Ishbel Group, and is overlain unconformably by dark grey-weathering shales of the Jurassic Fernie Formation (Figure 2).

Sulphur Mountain Formation

Previous work in the Smoky-Brazeau Rivers area of Alberta (Gibson 1968a, 1968b) showed that the Sulphur Mountain Formation can readily be divided into four lithologic members, which are, in ascending order; Phroso Siltstone Member, Vega Siltstone Member, Whistler Member, and Llama Member. Between Bow River and Crowsnest Pass, however, the upper two members are difficult to recognize because of a distinct facies change and because of pre-Jurassic and Pleistocene-Recent erosion.

The Sulphur Mountain Formation consists of dark grey to rusty brown-weathering, calcareous and dolomitic siltstone and sandstone, silty limestone and dolomite, and shale. It ranges in thickness from 284 feet at Picklejar Creek (Section 6) to 1,683 feet at Abby Ridge (Section 7) on the west side of Elk River. In the Bourgeau Thrust Sheet and the southern part of the Lewis Thrust Sheet (Figure 1), the Sulphur Mountain Formation is conformably and gradationally overlain by the Whitehorse Formation, whereas in the remainder of the region it is unconformably overlain by the Jurassic Fernie Formation. The Sulphur Mountain Formation disconformably overlies the Permian Ishbel Group.

Phroso Siltstone Member

The Phroso Siltstone Member comprises an assemblage of shaly to flaggy, dark grey, calcareous and dolomitic siltstones and minor amounts of shale, similar to those previously described in an earlier investigation (Gibson, 1968a). Dense, fine-grained quartz sandstone beds as much as 1 foot thick occur in the lower 5 feet of the member near the contact with Permian rocks. Phroso strata are generally finely laminated and thinly bedded. In some western sections, however, there are intervals as much as 8 feet thick containing dense, resistant, non-laminated siltstone beds between 6 and 15 inches thick. These beds resemble strata in the overlying Vega Siltstone Member. The siltstones and shales are mineralogically similar to those

described in the Brazeau-Athabasca region of Alberta (Gibson 1968a, 1968b), but there is one noticeable difference. In the Bow River-Crowsnest Pass region, the Phroso Member contains a large amount of calcite cement, and calcareous siltstone forms a prominent marker at some western localities, i. e., Sections 7, 8 and 10. The calcareous siltstones generally occur in the upper half of the member, where they may interdigitate with thin-bedded, dolomitic siltstone and shale, or may comprise the entire upper part. The calcareous strata are absent at the eastern localities, i. e., Sections 1, 3 and 6, where the dominant lithology is dolomitic siltstone and shale.

The Phroso Siltstone Member has a minimum measured thickness of 100 feet at Picklejar Creek (Section 6) in the McConnell Thrust Sheet, and a maximum thickness of 800 feet at Ross Creek (Section 10) in the Bourgeau Thrust Sheet (Figure 1). This indicates an increase in stratigraphic thickness from east to west across the structural strike of the region.

The Phroso Siltstone Member rests unconformably on chert, cherty dolomite, and sandstone of the Permian Ishbel Group. At most sections where the contact is exposed, a cherty, quartzose, phosphatic, pebble-conglomerate, ranging in thickness from a few inches to 1 foot, is found at the base of the Phroso Member. Where the contact is talus-covered, the sharp contrast in weathering profile between resistant Ishbel rocks and recessive strata of the Phroso Member permits easy placement of the contact. The contact with the overlying Vega Siltstone Member is conformable and distinct, or gradational. Most sections in the McConnell and Lewis Thrust Sheets (Figure 1) display a conformable and distinct contact. It is placed at the base of the first continuous occurrence of resistant dolomitic and calcareous siltstone beds. Some sections in the Bourgeau Thrust Sheet and western part of the Lewis Thrust Sheet, however, display a gradational contact, necessitating placement of the contact between the members within a stratigraphic interval of several feet.

The Phroso Siltstone Member is sparsely fossiliferous, containing indeterminate ammonite impressions, phosphatic lingulid shell fragments, and the index fossil pelecypod Claraia stachei Bittner (GSC loc. 79361). Tozer states that this fossil is of Lower Triassic Griesbachian age.

Vega Siltstone Member

The Vega Siltstone Member comprises a sequence of generally well-indurated, greyish to rusty brown-weathering, carbonaceous-argillaceous¹, dolomitic, calcareous quartz siltstone, silty limestone, and shale. Locally, beds of very fine-grained, dolomitic quartz sandstone and sandy to silty dolomite, are intercalated in parts of the member, especially near the contact with the Llama Member in some eastern sections. The silty limestones are finely crystalline, partly bioclastic, and occur as subrhythmic

¹Because of the colour-masking effect, and intimate association of the organic carbonaceous matter with the clay minerals, it was not possible to distinguish the organic and argillaceous constituents using a binocular or petrographic microscope. One or both constituents may be present in a given sample.

alternations with calcareous siltstones in some of the more westerly sections. The bioclastic components of the limestones consist of abraded and broken pelecypod or brachiopod shells, and were observed at Smith-Dorrien Creek (Section 2). The Vega Siltstone Member is generally thin- to medium-bedded at the base, and thick-bedded at the top. Bed thicknesses between 3 and 5 feet are not uncommon near the top of the member at most localities. The lower one-half to one-third of the member generally consists of thin, wavy to lenticularly laminated to micro-crosslaminated beds, averaging 2 inches thick. These beds weather shaly to flaggy and often contain thin zones of fissile, dark grey shale. The thicker beds of the upper one-half of the member are commonly lenticular, faintly to non-laminated, and commonly display cyclical bedding, a feature characteristic of the member throughout the Foothills and Front Ranges of the Rocky Mountains (Gibson, 1968a, p. 12). The thicker beds also contain flow rolls or load casts, bounce casts, current ripple-laminations, crossbedding, and oscillation ripple-marks. These structures are often typical of shallow-water deposition.

The Vega Siltstone Member ranges in thickness from a minimum of 180 feet at Picklejar Creek in the McConnell Thrust Sheet, to a maximum of 1,193 feet at Forsyth Creek (Figure 1). In the McConnell Thrust Sheet the Vega Siltstone Member shows a marked westerly thickening. At Picklejar Creek, one of the most easterly sections examined, the Vega Member is 180 feet thick, whereas immediately to the west at Elpoca Mountain, the member is 675 feet thick.

The lower half of the Vega Siltstone Member has a relatively large content of calcite. The calcite occurs as cement, and as a recrystallized, finely crystalline to bioclastic limestone, interbedded with the calcareous and dolomitic siltstones. The thickness of the calcareous lithofacies increases toward the west. During a previous study in the Smoky-Brazeau River region of Alberta (Gibson, 1968a, 1968b), the writer did not observe this distinctive calcareous unit. Other unusual lithofacies of the Vega Siltstone Member in the Bow River-Crowsnest Pass region were observed at Spray River gorge (Section 17), Storelk Mountain (Section 4), Forsyth and Ross Creeks (Sections 8 and 10), and Burns and Picklejar Creeks (Sections 5 and 6). At Spray River gorge, the type locality for the Sulphur Mountain Formation, the top of the Vega Member is characterized by a 4-foot thick unit of fine- to medium-crystalline, light grey to yellow-grey, mottled dolomite, a facies that is generally more characteristic of the Whitehorse Formation. This carbonate unit is in contact with the overlying Whistler Member. At Storelk Mountain in the Elk Range, a similar light grey-weathering dolomitic siltstone to silty dolomite lithofacies was observed near the contact with the Llama Member. The unit is 59 feet thick, and contains interbedded wavy, thin, light grey chert. At Forsyth and Ross Creeks, on the west side of Elk River, a dark grey, recessive, shaly siltstone facies was observed near the top of the Vega Siltstone Member. This distinctive facies has some characteristics of the Whistler and Phroso Siltstone Members. Because strata overlying this recessive unit closely resemble part of the Vega Siltstone Member, and because diagnostic Middle Triassic fossils are absent, the recessive lithofacies is considered to be a tongue of the Phroso Siltstone Member, but is included in the Vega Member. The third unusual facies of the Vega Siltstone Member was observed at Burns and Picklejar Creeks where the Vega Member is capped by a unit, as much as

55 feet thick, ranging from fine-grained dolomitic sandstone with some scattered skeletal debris, to quartzose dolomite. The unit resembles the Llama Member but is here considered to be part of the Vega Siltstone Member because fossils of probable Lower Triassic age were collected from beds near the base at Picklejar Creek.

The mineral composition of the member is similar to the underlying Phroso Siltstone Member. The detrital fraction consists predominantly of quartz, with lesser amounts of orthoclase and plagioclase feldspar. Most grains display varying degrees of secondary silicification and carbonate corrosion. Accessory minerals include chert, muscovite, collophane, tourmaline, zircon, rutile, pyrite, clay minerals, and opaque organic matter. Dolomite and calcite commonly occur as an intergranular cement. In the lower half of the member, the carbonate content often exceeds that of quartz.

The Vega Siltstone Member rests conformably, and gradationally, on the Phroso Siltstone Member. The upper contact with the Whistler or Llama Members is conformable, whereas the contact with the Fernie Formation is unconformable. At Spray River gorge (Section 17), the Vega Member is conformably overlain by a recessive sequence of dark grey dolomitic siltstone of the Middle Triassic Whistler Member. Similar recessive siltstone intervals were observed at Forsyth Creek, Storelk Mountain and Smith-Dorrien Creek, but contain strata more characteristic of the Llama Member. Thus, the Whistler Member may interfinger or grade laterally into the Llama Member. Throughout most of the central and eastern parts of the study-region the Vega Siltstone Member is overlain conformably, and at some sections gradationally, by the Llama Member. At Evans-Thomas Creek, Elpoca Mountain, and Mist Mountain, the upper beds of the Sulphur Mountain Formation are eroded, and the Vega Siltstone Member is separated from the Jurassic Fernie Formation by erosional unconformity (Figure 2).

Fossils are scarce in the Vega Siltstone Member. Those identified by Tozer include Posidonia cf. P. mimer Oeberg (GSC loc. 79364) and Euflemingites cf. E. cirratus (White) (GSC loc. 79361) of Early Triassic Smithian age, and the pelecypods Eumorphotis cf. multiformis Bittner and Anodontophora sp. (GSC loc. 79363) of probable Early Triassic age.

Whistler Member

The Middle Triassic Whistler Member in the Bow River-Crowsnest Pass region is recognized only at Spray River gorge (Section 17) in the northwestern part of the area. It consists of a recessive, shaly to flaggy sequence of dark grey, carbonaceous-argillaceous, dolomitic quartz siltstone. The member is 44 feet thick, thin- to indistinctly bedded, and contains fine, light grey, regular to lenticular laminations which are partly responsible for the shaly to flaggy character of the strata. At Smith-Dorrien Creek (Section 2) a recessive, thin- to medium-bedded siltstone unit overlies the Vega Member. Although this distinct facies is considered to be part of the Llama Member, it may be equivalent in age and correlate with the Whistler Member. The restricted distribution of the Whistler Member possibly may be a result of syn-depositional thinning, or of a facies change to typical Llama lithology.

The Whistler Member conformably overlies the Vega Siltstone Member. The upper contact with the Llama Member is also conformable and distinct. It is placed at the base of a resistant, yellow-brown-weathering sequence of siltstone to very fine-grained sandstone.

Llama Member

Strata of the Llama Member are the youngest Triassic rocks exposed in the region owing to pre-Jurassic and Pleistocene-Recent erosion of overlying beds. The member consists of medium grey, dense, well-indurated, dolomitic siltstone and very fine-grained sandstone. It is thin- to thick-bedded, and weathers to a distinctive yellowish grey-brown. Most thin beds contain fine, wavy to lenticular, dark grey, carbonaceous-argillaceous laminations. The thicker beds are generally non-laminated, but occasionally are cross-bedded. Mineralogically, the Llama Member is similar to the underlying members of the Sulphur Mountain Formation. It contains, however, a much larger amount of terrigenous detrital minerals such as quartz and feldspar. Insoluble residue values obtained from representative samples of the Llama Member indicate an average value of 73 per cent at Smith-Dorrien Creek (Section 2), 70 per cent at Storelk Mountain (Section 4), and 78 per cent at Forsyth Creek (Section 8). These values are notably higher than those recorded from the Llama Member in the Athabasca-Brazeau River area (Gibson, 1968a, p. 16), where average residue values are only slightly greater than 50 per cent, and never exceed 60 per cent. Facies changes within the member in the Bow River-Crowsnest Pass region are uncommon although, at Burns Creek (Section 5) and Abby Ridge (Section 7), two notable lithologic changes were observed. At Burns Creek, the upper 40 feet of the Sulphur Mountain Formation consists of a mottled yellow and grey, dolomitic, quartz siltstone to very fine-grained sandstone, with scattered skeletal debris. This facies might be considered as representative of the Whitehorse Formation because of its relatively high carbonate content, and light coloration: however, the writer includes these rocks as part of the Llama Member because similar strata have been observed underlying the Whitehorse Formation in other regions north of Bow River. At Abby Ridge, the lower two-thirds of the Llama Member resembles, to some extent, strata of the Whistler Member and, therefore, may be considered a facies equivalent of the same age. The upper 40 feet only of the Sulphur Mountain Formation at Abby Ridge are typical of the Llama Member.

The Llama Member ranges from a maximum measured thickness of 210 feet at Smith-Dorrien Creek (Section 2), to a minimum measured thickness of 5 feet at Picklejar Creek (Section 6). Based on measurements of a few complete sections, it seems that the member increases in thickness toward the west, similarly to the other members of the Sulphur Mountain Formation.

The Llama Member is conformably overlain by the Whitehorse Formation at 4 localities. Elsewhere, the Llama Member represents the youngest Triassic exposure and, therefore, the character of the upper contact at these localities is unknown. At Storelk Mountain and Grave Lake (Sections 4 and 9), the Sulphur Mountain-Whitehorse Formation contact is gradational and is placed in a zone of maximum colour and compositional change. At Abby Ridge and Spray River Gorge (Sections 7 and 17), the upper contact of the Llama Member is sharp and abrupt. It is placed at the

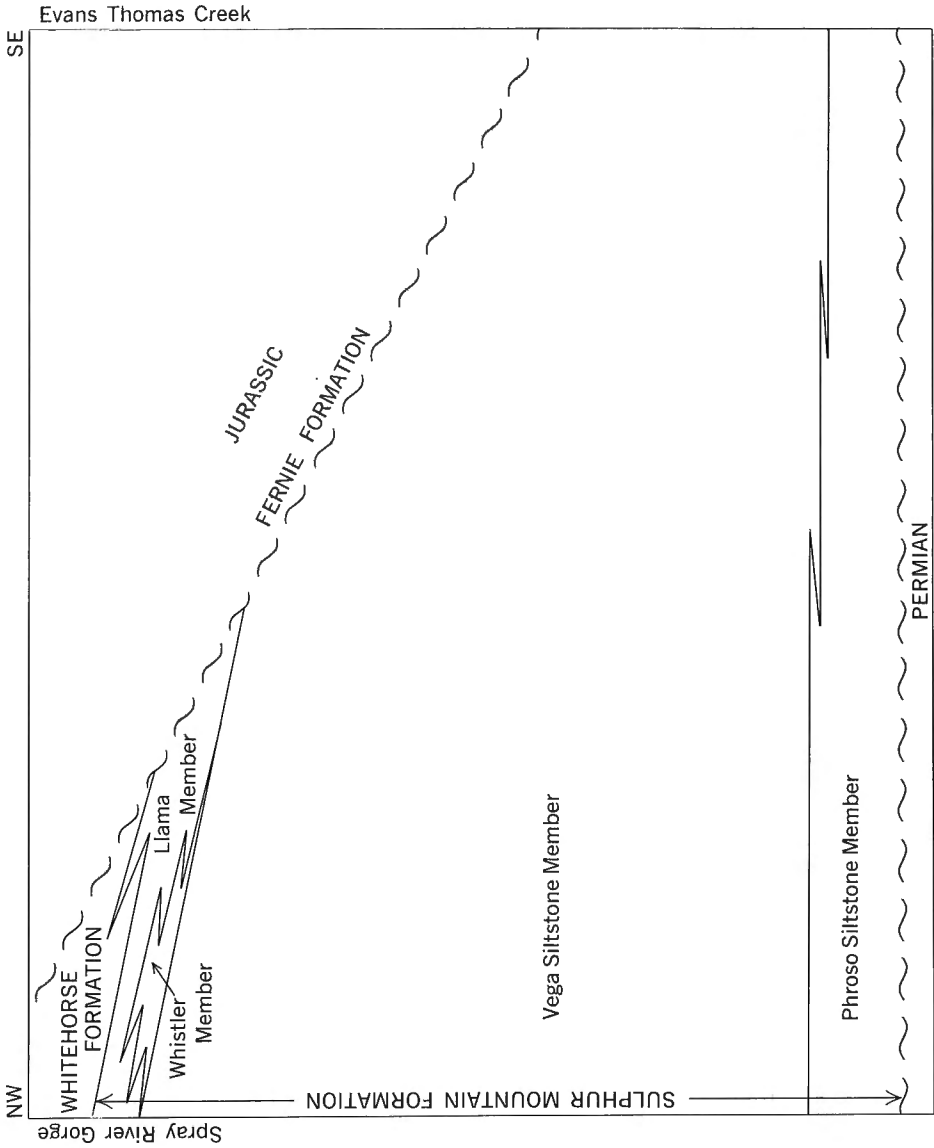


Figure 2. Schematic diagram illustrating stratigraphic relationships between Spray River Gorge and Evans Thomas Creek

colour and lithologic change between the medium grey and yellow-brown siltstones and sandstones of the Llama Member, and the light grey and yellow sandstones and carbonates of the overlying Whitehorse Formation.

Fossils collected from the member include Gymnotoceras sp., Daonella sp., (GSC loc. 79368) lingulids, and indeterminate pelecypods. Tozer suggests a Middle Triassic Anisian age.

Whitehorse Formation

The Whitehorse Formation in the Bow River-Crowsnest Pass region has a limited areal distribution. The formation is thin, generally restricted to the thicker western sections, and like the underlying Llama Member, has undergone extensive pre-Jurassic and Pleistocene-Recent erosion. Between Smoky and Brazeau Rivers, the Whitehorse Formation can be subdivided into four distinct lithofacies (Gibson, 1968a, 1968b). In the current study-area, however, the Whitehorse Formation is not amenable to stratigraphic subdivision.

The Whitehorse Formation comprises a light grey- to yellow-weathering, thin- to thick-bedded, assemblage of sandstone and siltstone, with some interbedded sandy dolomite, limestone, and collapse breccia. Sandstones and siltstones are the predominant rock types. These are quartzose, and are commonly cemented with fine- to medium-crystalline calcite and dolomite. The dolomite is finely crystalline and occurs as dense, well-indurated to sometimes poorly indurated, porous beds. The limestone, like the dolomite, generally occurs as intercalated beds with the sandstone and siltstone. At Lodgepole Creek (Section 11), however, almost the entire formation (20 feet) consists of dense, subconchoidal-fracturing, partly bioclastic, light grey-weathering limestone. The lower 5 feet are composed of calcareous dolomite. Collapse breccia, a characteristic facies of the Whitehorse Formation north of Bow River was observed at Abby Ridge (Section 7). It consists of yellow-weathering, "chalky", angular limestone clasts, up to 1 inch in diameter, in a coarsely recrystallized calcite matrix and cement. Allan and Carr (1947) recorded 80 feet of "white, light grey, and pink, hard sandy limestones, and cherty limestones", at the top of the Triassic section at Picklejar Creek (Section 6). On the basis of lithology, they considered this distinctive carbonate facies to be equivalent to the Middle Triassic Whitehorse Member of the Spray River Formation. The results of a detailed examination of this unusual carbonate sequence by the writer indicate that the unit is probably a faulted slice of the Permian Ishbel Group. The Whitehorse Formation ranges in thickness from a minimum of 20 feet at Lodgepole Creek (Section 11) to a maximum measured thickness of 173 feet at Spray River gorge (Section 17). The latter thickness, however, is incomplete owing to truncation by faulting.

The Whitehorse Formation is sparsely fossiliferous. Those fossils collected include Alectryonia? sp. (GSC loc. 79362), Hoernesia sp. (GSC loc. 79366), and indeterminate gastropods and rhynchonelloid brachiopods. Tozer suggests a Middle or Late Triassic age for the fossils.

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APPENDIX

Measured Sections

Section 1: Evans-Thomas Creek; 2 2/5 miles upstream from junction of Evans-Thomas Creek and Kananaskis-Coleman forestry road. (50° 51 3/4' N; 115° 06 1/2'W). Stratigraphic field section GK-67-14.

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
SULPHUR MOUNTAIN FORMATION (654 feet)			
<u>Vega Siltstone Member</u> (540 feet)			
11	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous; medium dark grey, weathering dull brownish grey; thin- to thick-bedded, up to 3 feet thick with beds becoming thicker toward top; fine, light grey, wavy to lenticular laminations in thinner beds; bedding wavy and lenticular; well-indurated; unit forms disconformable contact with overlying fossiliferous Fernie Formation; resistant	65	654
10	Siltstone, quartzose, very dolomitic, carbonaceous-argillaceous, slightly pyritiferous; medium dark grey, weathering greyish brown; thin- to medium-bedded, up to 18 inches thick; thinner beds lenticular, and contain fine, wavy, lenticular, light grey laminations, thicker beds faintly to non-laminated; unit displays cyclical bedding typical of member; weathers flaggy in slabs up to 2 inches thick; resistant to slightly recessive	70	589
9	Siltstone to silty shale, quartzose, very dolomitic and carbonaceous, possibly argillaceous; medium dark grey, weathering same with slight brown tint; thin-bedded, but in part indistinctly bedded; fine, regular to slightly wavy, light grey laminations; weathers shaly to flaggy; resembles Phroso Siltstone strata; recessive	25	519
8	Siltstone to silty shale, same as unit 9 but is mainly covered with minor outcrop near top; few coarse-ribbed ammonite fragments; recessive	25	494

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
7	Siltstone, quartzose, very dolomitic, carbonaceous, slightly pyritiferous; medium dark grey, weathering same; indistinctly bedded and partly covered except for upper 5 feet which appear to be thick-bedded; fine, regular to slightly wavy laminations; upper 5 feet contain small flow rolls; weathers flaggy; recessive except for upper 5 feet	36	469
6	Siltstone, quartzose, dolomitic, carbonaceous, possibly argillaceous; medium dark grey, weathering dark greyish brown; thin- to medium-bedded, up to 15 inches thick; fine, regular to slightly wavy laminations in thinner beds; thicker beds faintly to non-laminated; small, ovoid, chert concretions up to 6 inches in diameter; upper 25 feet thin-bedded; slightly recessive to recessive	56	433
5	Siltstone, quartzose, very dolomitic, carbonaceous-argillaceous; medium to dark grey, weathering greyish brown; thin- to thick-bedded, up to 4 feet thick with most beds between 8 and 12 inches; thin beds finely laminated; cyclical development typical of Vega Member; well-indurated; forms water falls; very resistant	100	377
4	Siltstone, quartzose, dolomitic, carbonaceous, slightly pyritiferous; medium dark grey, weathering greyish brown; thick- to indistinctly bedded, top bed 3½ feet thick; some beds display discontinuous, dark grey, lenticular laminations; unit appears to be mainly non-laminated; unit does not display cyclical bedding characteristic of member; resistant	63	277
3	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous; medium to medium dark grey, weathering dark greyish brown; thin- to medium-bedded, up to 10 inches thick; thin beds contain fine, regular to lenticular, dark grey laminations, in part micro-cross-laminations; minor penecontemporaneous		

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
	slumping, and "cut-and-fill" structures; small normal fault in unit; lithology typical of Vega Member; resistant; unit marks base of Vega Siltstone Member	100	214
	<u>Phroso Siltstone Member (114 feet)</u>		
2	Siltstone to silty shale, quartzose, dolomitic, carbonaceous, possibly argillaceous, slightly pyritiferous; medium dark to dark grey, weathering same; indistinctly bedded; unit contains fine to coarse, light grey, regular to wavy laminations; scattered micro- aggregates of pyrite; flattened indeterminate ammonites at base; weathers shaly to flaggy; resistant to slightly recessive	37	114
1	Covered interval; zone occupied in part by Evans-Thomas Creek; base of unit consists of conglomerate, with sub-rounded dolomitic siltstone and chert pebbles and cobbles, up to 6 inches in diameter, in a quartzose, phosphatic, pyritiferous matrix and cement; unit forms undulating contact with Ishbel Group; very recessive	77	77

Section 2: Smith-Dorrien Creek; $2\frac{1}{4}$ miles by logging road and trail from saw mill at Mud Lake, north side of valley. ($50^{\circ} 49\frac{1}{4}'$ N; $115^{\circ} 17\frac{1}{4}'$ W). Stratigraphic field section GK-67-32.

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
SULPHUR MOUNTAIN FORMATION (INCOMPLETE)			
<u>Llama Member (Incomplete)</u>			
17	Siltstone, quartzose, dolomitic slightly carbonaceous-argillaceous, possibly pyritiferous; medium grey to light olive-grey, weathering yellowish brown-grey; medium- to thick-bedded; trace of lenticular laminations; well-indurated; spheroidal weathering in part; resistant; unit represents top of exposed section, no sign of Whitehorse Formation in overlying talus	98	1,345
16	Siltstone to very fine-grained sandstone, quartzose, dolomitic, carbonaceous-argillaceous; medium grey with slight olive tint, weathering dark grey to greyish yellow; thin- to medium-bedded, up to 1 foot thick; thin beds contain wavy, lenticular laminations, thicker beds non-laminated; thicker beds well-indurated; weathers flaggy in part; resistant	60	1,247
15	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous; medium grey to olive-grey, weathering dark greyish yellow; thin- to medium-bedded; thin beds laminated, thicker beds faintly to non-laminated; moderately indurated; recessive; unit represents probable base of member, and may represent facies equivalent of Whistler Member; underlying unit consists of silty limestone	52	1,187
<u>Vega Siltstone Member (940 feet)</u>			
14	Covered interval, measurement approximate, as section shifts higher on ridge for better exposure	20	1,135

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
13	Limestone, quartzose, slightly carbonaceous-argillaceous, and ferruginous; unit may be in part classed as very calcareous siltstone; carbonate finely crystalline, and bioclastic in part; medium grey with slight brown tint, weathering dark yellowish grey; thin-bedded, averaging 1 inch thick; bedding very wavy to lenticular; contains fine to coarse, wavy and lenticular; carbonaceous laminations, laminae in part appear to consist of thin shells; some micro-cross-laminations; bioclastic limestone consists of thin comminuted shells, probably ostracod material; upper 50 feet partly talus covered, lower 50 feet resistant and cliff-forming	100	1, 115
12	Limestone and siltstone, quartzose, carbonaceous-argillaceous; limestone in part bioclastic, consisting of small ostracod-like shells parallel to bedding; limestone and siltstone interbedded, although there is higher concentration of siltstone; medium to medium light grey, weathering greyish yellow; thin-bedded, up to 2 inches thick with beds very wavy and lenticular; siltstone finely laminated, limestone contains coarser laminations; weathers very flaggy; limestone beds increase in number toward top; slightly recessive to resistant	55	1, 015
11	Siltstone, quartzose, very calcareous, carbonaceous-argillaceous; medium to dark grey, weathering dark greyish yellow; indistinctly bedded, few lenticular beds up to 3 inches thick; unit contains fine to coarse, regular to wavy lenticular, light and dark grey laminations; appears to be alternation of light grey-weathering, very calcareous siltstone or silty limestone and greyish yellow-weathering, slightly calcareous siltstone; unit slightly recessive	60	960

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
10	Covered interval, except for small exposure 5 feet thick 135 feet from base consisting of siltstone to very fine-grained sandstone, quartzose, dolomitic, carbonaceous-argillaceous, slightly pyritiferous, and calcareous; medium grey, weathering dark, yellowish brown; thin- to medium-bedded; resistant; better exposure along strike, south side of basin	205	900
9	Siltstone, quartzose, calcareous, carbonaceous, possibly argillaceous, slightly pyritiferous; medium to medium light grey with slight brownish tint, weathering dark grey-brown to rusty brown; thin- to medium-bedded, up to 6 inches thick; thin beds finely laminated, thicker beds faintly to non-laminated; some beds micro-cross-laminated; weathers shaly to flaggy; lithology more characteristic of Vega Member; slightly recessive	150	695
8	Covered interval	50	545
7	Siltstone to silty limestone, quartzose, very carbonaceous-argillaceous; dark grey, weathering dark greyish brown; indistinctly bedded, but a few beds up to 3 inches thick; fine, regular to lenticular, light grey laminations; unit resembles strata of Phroso Member; unit partly covered; recessive	100	495
6	Covered interval	100	395
5	Siltstone, quartzose, very calcareous, and may be in part classed as silty limestone, very carbonaceous-argillaceous, possibly pyritiferous; dark grey, weathering greyish brown to rusty brown; thin-bedded, but in part indistinctly bedded; fine, regular to lenticular, light grey laminations; weathers very flaggy in $\frac{1}{2}$ to 1 inch thick plates; forms probable contact with Phroso Member; slightly recessive; Vega Siltstone Member better exposed along strike, south side of valley	100	295

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
<u>Phroso Siltstone Member (195 feet)</u>			
4	Covered interval; strata underlying this unit are dolomitic in contrast to strata above unit which are very calcareous; recessive	60	195
3	Siltstone to silty shale, quartzose, dolomitic, very carbonaceous-argillaceous, slightly pyritiferous; dark grey, weathering same; indistinctly bedded; fine, regular to lenticular, light grey laminations; weathers shaly to flaggy; strata typical of member; recessive	35	135
2	Covered interval; talus same as unit 3	80	100
1	Siltstone, quartzose, dolomitic, very carbonaceous-argillaceous, pyritiferous in part; dark grey, weathering same; indistinctly bedded; unit contains fine, regular to lenticular, light grey laminations; basal 1 foot consists of fine- to very fine-grained sandstone, and phosphatic pebble-conglomerate; unit rests disconformably on Ishbel Group; unit slightly recessive	20	20

Section 3. Elpoca Mountain; section measured on northwest side of small intermittent creek, located 3/4 mile upstream from Coleman-Kananaskis forestry road (50° 39 1/4' N; 115° 01 3/4' W). Stratigraphic field section GK-67-16.

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
SULPHUR MOUNTAIN FORMATION (834 feet)			
<u>Vega Siltstone Member (674 feet)</u>			
10	Siltstone to very fine-grained sandstone, quartzose, very dolomitic, and may be in part classed as sandy to silty dolomite, slightly carbonaceous-argillaceous; pale yellowish brown, weathering dark grey-brown; thin- to thick-bedded, up to 4 feet thick; some thinner beds display fine, regular to contorted, light and dark grey laminations; massive beds display spheroidal weathering; sandstone occurs near Fernie contact; unit overlain by medium to dark grey cherty siltstone to sandstone (23 feet) which is classed, on basis of colour, as Rock Creek Member of Fernie Formation; unit resistant	53	834
9	Siltstone, quartzose, dolomitic, possibly carbonaceous-argillaceous; medium to medium light grey to pale yellowish brown, weathering dark grey-brown; thin- to thick-bedded, up to 5 feet thick, with most beds ranging between 1½ to 3 feet thick; few intercalated, thin, finely laminated to cross-laminated beds; poorly preserved oscillation ripple-marks; massive; displays spheroidal weathering; some beds contain micro-aggregates of pyrite; well-indurated; resistant	50	781
8	Siltstone, quartzose, very dolomitic in part, carbonaceous-argillaceous; medium light to light grey with slight brown tint, weathering yellowish grey-brown to dark brown; thin- to medium-bedded, up to 15 inches thick; thin beds contain fine, regular to slightly wavy laminations, thicker beds faintly to non-laminated; thin beds weather shaly to flaggy; upper 15 feet very shaly and recessive; unit displays cyclical bedding characteristic of member; poorly formed flow rolls; poorly preserved indeterminate ammonites in lower 50 feet; resistant to slightly recessive	100	731

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
7	Siltstone, quartzose, very dolomitic, slightly carbonaceous-argillaceous, and pyritiferous; medium grey to pale yellowish brown with slight olive tint, weathering dark yellowish grey-brown; thin- to medium-bedded, up to 2 feet; thin beds display fine, regular to wavy, light and dark grey laminations; displays cyclical bedding in part; poorly preserved coarse-ribbed ammonite impressions in upper 50 feet; slightly recessive to recessive	100	731
6	Siltstone to silty dolomite, quartzose, calcareous, carbonaceous-argillaceous; medium dark grey to light olive-grey, weathering dark grey-brown to rusty brown; thin- to thick-bedded, up to 3½ feet thick; thin beds display fine, regular to slightly wavy laminations, thicker beds faintly to non-laminated; cross-bedded in part; upper 30 feet dolomitic and contain small flow rolls; remainder of unit very calcareous; cyclically bedded; thin beds weather shaly to flaggy; beds very lenticular in part in lower 50 feet; resistant to slightly recessive	83	531
5	Siltstone, to very fine-grained sandstone, quartzose, dolomitic, slightly carbonaceous-argillaceous, and slightly calcareous; medium light grey, weathering yellowish brown to rusty brown; thin- to medium-bedded, up to 15 inches thick; beds very lenticular and contain fine, wavy to regular laminations; in part displays micro-cross-laminae; unit not typical of Vega Member; resistant to slightly recessive	50	448
4	Siltstone to very fine-grained sandstone, quartzose, dolomitic, slightly calcareous and carbonaceous; medium grey, weathering yellowish grey-brown to rusty brown; indistinctly to medium-bedded, few beds up to 15 inches thick; displays slight mottled appearance; unit transitional to typical Vega lithology; resistant	50	398

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
3	Siltstone, quartzose, dolomitic slightly calcareous, and carbonaceous-argillaceous; medium grey with slight olive-brown tint, weathering greyish brown to rusty brown; mainly indistinctly bedded; few well-indurated beds up to 2 inches thick; unit displays fine, regular to lenticular laminations; weathers very flaggy in 2- to 3-inch thick slabs; unit not typical of Vega Member; resistant to slightly recessive	150	348
2	Siltstone, quartzose, very dolomitic, calcareous, carbonaceous-argillaceous; medium grey, weathering greyish brown to rusty brown; thin to medium-bedded, up to 15 inches thick; bedding very lenticular; thin beds display fine, lenticular to micro-cross-laminations; weathers very flaggy to shaly in part; unit represents base of Vega Member; slightly recessive to resistant	38	198
<u>Phroso Siltstone Member (160 feet)</u>			
1	Covered interval; talus consists of typical, dark grey, finely laminated, shaly siltstone; unit underlain by Ishbel Group; very recessive	160	160

Section 4: Storelk Mountain; section measured on north bank of intermittent stream gully, west side of Elk Range, northwest of Storelk Mountain. (50° 33 $\frac{1}{4}$ ' N; 115° 01 $\frac{1}{2}$ ' W). Access via Elk River - Kananaskis Lakes forestry road. Stratigraphic field section GK-67-25.

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
WHITEHORSE FORMATION (INCOMPLETE)			
16	Dolomite to very fine-grained sandstone, quartzose, slightly pyritiferous; sandstone very dolomitic; dolomite very finely crystalline; yellowish grey to medium light grey, weathering same; medium-bedded, up to 10 inches thick; some beds display wavy, lenticular sand laminations; small pockets and vugs filled with black vitreous pyrobitumen residue; pelecypods near base - <u>Hoernesia</u> sp. GSC loc. 79366; unit appears more sandy near top; no indication of Fernie outcrop in vicinity; recessive	20	1, 103
SULPHUR MOUNTAIN FORMATION (1, 083 feet)			
<u>Llama Member (142 feet)</u>			
15	Siltstone, quartzose, very dolomitic, slightly pyritiferous; light grey to medium olive-grey, weathering medium grey with slight reddish tint; medium-bedded; weathered pyrite micro-aggregates throughout; slightly recessive, unit gradational to Whitehorse Formation	10	1, 083
14	Siltstone, to silty dolomite, quartzose, very calcareous, carbonate finely crystalline; medium light grey with slight orange tint, weathering light grey to light yellow-grey; medium-bedded, up to 1 foot thick; mottled colours in part; unit resembles Whitehorse lithology, like unit 15 may be classed as gradation to Whitehorse Formation; recessive	10	1, 073

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
13	Siltstone, quartzose, dolomitic; light olive-grey, weathering yellowish grey-brown to dull pinkish grey; medium- to thick-bedded, up to 2½ feet thick; well-indurated; resistant to slightly recessive	30	1,063
12	Siltstone to very fine-grained sandstone, quartzose, dolomitic, carbonaceous-argillaceous, slightly pyritiferous and phosphatic; medium dark grey, weathering pinkish grey-brown; thin- to thick-bedded, beds as much as 4 feet thick near base; thin beds contain fine to coarse, wavy, lenticular laminations; thicker beds display spheroidal weathering; Lingulid fragments throughout upper 5 feet; well-indurated; resistant to slightly recessive	58	1,033
11	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous, pyritiferous, slightly phosphatic in part; medium grey with slight olive tint, weathering greyish brown; thin- to thick-bedded, up to 5 feet thick at base; lower 2 feet laminated and weather flaggy; some pene-contemporaneous slumping near base; unit ends typical lithology of member; resistant	34	975
<u>Vega Siltstone Member (706 feet)</u>			
10	Siltstone to dolomite, quartzose, calcareous, carbonaceous-argillaceous; medium grey, weathering light grey; medium-bedded, up to 1 foot thick; fine to coarse, regular to wavy to cross-laminations in part; few thin chert bands in centre of unit; unit partly covered; lithology and weathering character not typical of Vega Member; recessive	58	941
9	Siltstone, to very fine-grained sandstone, quartzose, dolomitic, slightly carbonaceous-argillaceous; medium light grey to pale yellowish brown, weathering yellowish grey-brown; medium- to thick-bedded; poorly formed flow rolls at base; spheroidal weathering in part; well-indurated; unit forms top of typical Vega Member lithology; resistant	20	883

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
8	Siltstone, quartzose, dolomitic, possibly carbonaceous-argillaceous; medium grey to pale yellowish brown, weathering dark grey-brown; thin- to medium-bedded, up to 2 feet thick; thin beds contain regular to very wavy laminations; thicker beds faintly to non-laminated; thin beds weather shaly to flaggy; typical cyclical bedding characteristic of member at other localities; thick beds well-indurated; recessive to slightly recessive	90	863
7	Siltstone and minor silty shale, quartzose, dolomitic, carbonaceous-argillaceous, slightly phosphatic and pyritiferous; medium to medium light grey, weathering yellowish grey-brown; thin- to medium-bedded, up to 1 foot thick, with most beds ranging between 4 and 6 inches thick; thicker beds lenticular with some containing trough crossbedding; thin beds contain coarse, lenticular laminations; typical cyclical bedding characteristic of member, except shaly laminated zones decrease in frequency toward top; resistant	80	773
6	Siltstone, quartzose, dolomitic, very calcareous, in part classed as silty calcareous dolomite, carbonaceous-argillaceous, carbonate finely crystalline; medium light grey to pale yellowish brown, weathering yellowish grey-brown; thin- to medium-bedded, up to 4 inches thick; fine, regular to slightly wavy laminations; weathers flaggy; unit forms top of prominent calcareous facies; slightly recessive to recessive	83	693
5	Siltstone, quartzose, dolomitic, slightly calcareous, carbonaceous-argillaceous; medium grey to pale yellowish brown, weathering dull greyish brown to yellow-grey-brown; thin- to medium-bedded; thin beds display fine to coarse, regular to slightly wavy laminations; thicker beds faintly to non-laminated; unit displays typical cyclical bedding of member; resistant	70	610

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
4	Siltstone to silty shale, quartzose, very calcareous and dolomitic and classed in part as silty dolomite, carbonaceous-argillaceous; carbonate very finely crystalline; medium dark grey with slight olive tint, weathering dark greyish brown; thin- to medium-bedded, up to 1 foot thick; thin beds contain fine, regular to wavy lenticular, dark grey laminations; thicker beds faintly to non-laminated; upper half of unit thicker bedded; thin beds weather shaly to flaggy; unit partly covered; recessive to slightly recessive	145	540
3	Covered interval	80	395
2	Siltstone, quartzose, very dolomitic, slightly calcareous, carbonaceous-argillaceous; medium dark grey to olive-grey, weathering greyish brown; thin-bedded, up to 2 inches thick; unit displays fine, regular to lenticular, to cross-laminations; weathers shaly; unit ends good exposure; resistant to slightly recessive	80	315
<u>Phroso Siltstone Member (235 feet ?)</u>			
1	Covered interval, except for sparse scattered outcrop near top consisting of siltstone similar to unit 2, except thinner bedded; unit represents Phroso Siltstone Member in part but exact contact with Vega Member uncertain; unit underlain by Ishbel Group; outcrop weathers shaly to flaggy; recessive	235	235

Section 5: Burns Creek; section measured on east and west sides of intermittent stream, 3/4 mile upstream from Sheep River forestry road. (50° 35 1/2' N; 114° 51 3/4' W). Stratigraphic field section GK-67-29.

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
SULPHUR MOUNTAIN FORMATION (331 feet)			
<u>Llama Member (40 feet)</u>			
7	Dolomite, quartzose, possibly argillaceous; quartz fine to very fine-grained; dolomite fine- to medium-crystalline and appears to consist of coquina of pelecypod shell fragments; unit medium to medium light grey, weathering light yellow-grey with brown tint; dolomite coquina permeated by black, vitreous, pyrobitumen residue; indistinctly bedded, but appears to be medium; well-fractured; upper part of unit consists of sandstone; coquina beds display distinct mottled appearance; resistant to slightly recessive; unit forms sharp contact with 2-foot thick bed of dark grey siltstone to sandstone of Fernie Formation; sandstone bed overlain by typical black calcareous shales of Fernie	40	331
<u>Vega Siltstone Member (181 feet)</u>			
6	Covered interval; no indication of outcrop or reliable talus samples; unit represents probable top of Vega Siltstone Member	22	291
5	Siltstone to very fine-grained sandstone, quartzose, very dolomitic in part and may be classed as silty to sandy dolomite; possibly carbonaceous-argillaceous, slightly pyritiferous; light to medium light grey, weathering dull, dark grey-brown to rusty brown; medium-bedded; upper 3 feet consist of light-weathering cherty dolomite and dolomitic sandstone; one bed contains light grey to white chert nodules 6 to 8 inches long by 3 inches wide; unit displays mottled appearance caused by profusion of fossil fragments; coarse to fine laminations in upper 3 feet; lower part of unit typical of member, slightly recessive to resistant	20	269

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
4	Siltstone, quartzose, very dolomitic, possibly argillaceous-carbonaceous; medium to medium light grey, weathering dark grey-brown; thin to thick-bedded, up to 5 feet thick, with most beds averaging 15 inches; few thin beds displaying fine, regular to lenticular laminations; massive flow roll unit at base; lithology typical of Vega Member of other localities; resistant	50	249
3	Siltstone, quartzose, dolomitic; medium light grey, weathering dark grey-brown; thin- to thick-bedded, up to 4 feet thick; thin beds display fine, regular to wavy laminations; thicker beds faintly to non-laminated; thicker beds lenticular; small normal fault at top; resistant to slightly recessive	39	199
2	Siltstone, quartzose, very dolomitic, carbonaceous-argillaceous, slightly pyritiferous; medium light to medium dark grey, weathering dark grey-brown; thin- to medium-bedded, up to 15 inches thick; thin beds display fine to coarse, regular to lenticular, dark grey laminations; thicker beds faintly to non-laminated; bedding very lenticular; cyclically bedded; thin beds weather very shaly; upper 25 feet contain well-formed flow rolls, and soft-sediment slump structures; unit forms sharp contact with underlying recessive Phroso Siltstone Member; resistant	50	160
<u>Phroso Siltstone Member (110 feet)</u>			
1	Covered interval; no sign of outcrop, but talus in part resembles Phroso Member; unit forms sharp contact with underlying Ishbel Group; unit very recessive	110	110

Section 6: Picklejar Creek; section measured on north side of ridge above Picklejar Lakes. Access by trail up west side of Lantern Creek, 1 3/4 miles from Coleman-Kananaskis forestry road. (50° 31' N; 114° 47' W). Stratigraphic field section GK-67-18.

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
SULPHUR MOUNTAIN FORMATION (INCOMPLETE)			
<u>Llama Member (5 feet)</u>			
7	Dolomite, quartzose, fine- to medium-crystalline; quartz fine-grained; yellowish grey with medium grey mottling, weathering dull yellow-grey; indistinctly bedded; unit permeated by solid black pyrobitumen material; overlying strata consists of black, fetid limestone and shale of Fernie Formation; slightly recessive	5	284
<u>Vega Siltstone Member (169 feet)</u>			
6	Sandstone and dolomite; sandstone, quartzose, very dolomitic and fine-grained; dolomite, slightly quartzose, possibly ferruginous; fine- to medium-crystalline; carbonate may be slightly phosphatic; unit light to medium light grey to yellowish grey, weathering dark orange-brown to yellow-rusty-brown; thin- to medium-bedded; dolomite consists mainly of comminuted pelecypod? shell fragments; sandstone displays fine, wavy hair-like, dark grey laminations in part; dolomite occurs as interbeds throughout unit; weathers flaggy, in 1/2- to 1-inch thick slabs; unit has slight resemblance to Llama Member of other regions; black, vitreous pyrobitumen residues filling pores of carbonate; unit resistant	20	279
5	Dolomite to sandstone, quartzose, phosphatic, unit appears to consist mainly of very quartzose dolomite, fine- to medium-crystalline; the quartz sand fraction mainly fine-grained, some phosphate medium- to coarse-grained; medium grey, weathering greyish brown to rusty brown; medium to thick-bedded where exposed; some sandstone beds display coarse laminations - in part poorly cross-laminated; comminuted phosphatic lingulid shell fragments in upper half; interval partly covered; slightly recessive	35	259

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
4	Siltstone to sandstone, quartzose, very dolomitic in part, possibly carbonaceous; sandstone very fine-grained; medium grey to pale yellowish brown, weathering grey-brown to rusty brown; medium- to thick-bedded, up to 3 feet thick; some thin beds display coarse laminations; rock permeated in part by black, resinous, pyrobitumen residues; upper 5 feet contain hydrocarbon-stained pelecypods and lingulid brachiopods - " <u>Eumorphotis</u> " cf. <u>multiformis</u> , and <u>Anodontophora</u> sp., GSC loc. 79363; slightly recessive	25	224
3	Siltstone, quartzose, dolomitic, possibly carbonaceous-argillaceous, slightly pyritiferous; light to medium light grey with slight bluish tint, weathering dull greyish brown; thin- to thick-bedded, with prominent dense, flow roll bed, up to 7 feet thick, at base; thinner beds display fine, regular to lenticular laminations, thicker beds faint to non-laminated; typical cyclical bedding characteristic of member at other localities; resistant to slightly recessive	32	199
2	Siltstone, same as unit 3, displaying cyclical bedding, well-developed flow rolls, and wavy to lenticular bedding; thin beds weather shaly to flaggy; unit very resistant and cliff-forming; unit forms base of member	67	167
<u>Phroso Siltstone Member (100 feet)</u>			
1	Covered interval; talus consists of typical shaly-weathering siltstone; very sharp contact with Vega Member; good contact with Ishbel Group, although no conglomerate or Triassic strata exposed at contact; very recessive	100	100

Section 7: Mount Bleasdell-Abby Ridge; section measured on east side of Abby Ridge. (50° 19 1/2' N; 114° 56 3/4' W). Access via Elk River forestry road and horse trail up west side of Abby Ridge. Stratigraphic field section GK-67-28.

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
WHITEHORSE FORMATION (INCOMPLETE)			
15	Sandstone, quartzose; slightly calcareous; fine- to very coarse-grained; grains well-rounded, consisting of quartz and chert in a matrix of fine-grained quartz; light grey to yellowish grey, weathering greyish yellow; thick-bedded, beds up to 3 feet thick; well-developed simple cross-stratification; unit becomes lighter in colour and coarser grained toward top, where in places it may be classed as pebble-conglomerate; soft, porous, yellow-grey collapse breccia consisting of angular, yellow, "chalky" limestone clasts in a coarsely crystalline calcite matrix and cement, occurs on dip slope at top of ridge; no sign of Fernie Formation; resistant	15	1,715
14	Covered interval, very recessive; base of unit marks probable contact with Sulphur Mountain Formation	17	1,700
SULPHUR MOUNTAIN FORMATION (1,683 feet)			
<u>Llama Member (feet)</u>			
13	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous; slightly pyritiferous; medium grey with slight brownish tint, weathering dark yellowish grey; medium-bedded, beds up to 2 feet thick; weathers flaggy in part; poorly preserved wavy laminations; well-indurated; very resistant	42	1,683
12	Siltstone and minor limestone, quartzose, carbonaceous-argillaceous, slightly pyritiferous; limestone fine- to medium-crystalline, bioclastic in part, and emits strong sulphurous odour upon fracture; medium dark grey, weathering same; medium- to thin-bedded, up to 15 inches thick; limestone occurs as lenticular beds in lower		

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
	5 feet and contains <u>Gymnotoceras</u> sp., and <u>Daonella</u> sp., GSC loc. 79368; siltstone may be dolomitic; unit slightly recessive	10	1,641
11	Siltstone, quartzose, calcareous, carbonaceous-argillaceous, slightly pyritiferous; dark grey, weathering same; thin- to thick-bedded, up to 3 feet thick, but averaging 15 inches; trace of fine, light grey laminations; displays spheroidal weathering; well-indurated; very resistant	36	1,631
10	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous, slightly pyritiferous; pale yellowish brown to light olive-grey, weathering brownish grey; medium-bedded, up to 2 feet thick, but most beds averaging 10 inches; unit displays fine, wavy to lenticular, dark grey laminations; weathers flaggy; upper 30 feet partly covered; unit represents probable base of Llama Member; resistant	70	1,595
<u>Vega Siltstone Member (1,355 feet)</u>			
9	Covered interval, no outcrop in vicinity of section line; some outcrop along ridge $\frac{1}{2}$ to 1 mile southeast; at this locality, no contact or exposure with Whitehorse Formation owing to talus and grass cover; present unit recessive	630	1,525
8	Siltstone to silty limestone, quartzose, carbonaceous-argillaceous, possibly pyritiferous; medium grey, weathering greyish brown to rusty brown; thin- to medium-bedded, up to 8 inches thick; fine to coarse, wavy, crenulated, light grey laminations, in part cross-laminated; bedding wavy and lenticular in part; resistant to slightly recessive	75	895
7	Siltstone, quartzose, very calcareous, carbonaceous-argillaceous, slightly ferruginous; medium to medium dark grey with slight brown tint, weathering yellowish grey-brown; thin- to medium-bedded, up to 15 inches thick; thin beds contain fine to coarse, regular to wavy crenulated, light grey laminations; thicker beds faintly to non-laminated; resistant to slightly recessive	90	820

Unit	Lithology	Thickness Above Base (feet)	Height Above Base (feet)
6	Siltstone to silty limestone, quartzose, carbonaceous-argillaceous pyritiferous; medium dark grey with slight brown tint, weathering yellowish grey-brown; indistinctly bedded; unit contains fine to coarse, crenulated, light grey laminations; weathers flaggy; unit partly covered; resistant to slightly recessive	60	730
5	Siltstone to silty limestone, same as unit 6	50	670
4	Siltstone, quartzose, calcareous, carbonaceous-argillaceous, slightly pyritiferous; dark grey, weathering greyish brown; indistinctly bedded; unit 50% covered; fine, regular to wavy, light grey laminations; lithology closely resembles that of Phroso Member; recessive	100	620
3	Siltstone, quartzose, calcareous, very carbonaceous-argillaceous, slightly pyritiferous, possibly dolomitic; dark grey, weathering greyish brown; thin-bedded, up to 3 inches thick, but indistinctly bedded in part; fine to coarse, regular to wavy, lenticular, light grey laminations; few black phosphate grains and fossil fragments in upper 50 feet; weathers shaly to flaggy; partly covered; recessive	150	520
2	Siltstone, quartzose, calcareous in part, very carbonaceous-argillaceous, slightly pyritiferous, possibly dolomitic; dark grey, weathering dull yellowish grey-brown to rusty brown; thin- to medium-bedded, up to 6 inches thick, but unit mainly thin-bedded; fine to coarse, light grey, regular to lenticular to micro-cross-laminations; medium beds very lenticular and more calcareous than thin beds; poorly preserved pelecypod casts in upper 50 feet; strata resemble those of Phroso Member; resistant to slightly recessive	200	370
<u>Phroso Siltstone Member ? (170 feet)</u>			
1	Covered interval, no obvious outcrop anywhere on ridge; contact with Vega Member questionable, may actually be placed at top of unit 2; unit underlain disconformably by sandstone and chert of Ishbel Group; unit very recessive	170	170

Section 8: Forsyth Creek; section measured on south side of Goat Mountain, 2 miles southeast of Connors Lake. (50° 17 3/4' N; 115° 02' W). Access via Elk River forestry road and Forsyth Creek - Connors Lake pack trail. Stratigraphic field section GK-67-27

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
SULPHUR MOUNTAIN FORMATION (INCOMPLETE)			
<u>Llama Member (Incomplete)</u>			
18	Siltstone, quartzose, very dolomitic and pyritiferous; yellowish grey to light olive-grey, weathering yellowish brown, thick-bedded; well-indurated; displays spheroidal weathering; unit represents top of section and axis of syncline; no Whitehorse Formation; unit resistant	40	1,627
<u>Vega Siltstone Member (1,193 feet)</u>			
17	Siltstone, quartzose, dolomitic, slightly pyritiferous, carbonaceous-argillaceous; pale yellowish brown to olive-grey, weathering yellowish brown; thin- to medium-bedded, up to 8 inches thick; thin beds display fine to coarse, wavy, lenticular, dark grey laminations; thicker beds faintly to non-laminated; unit displays slight cyclical bedding, thin beds weather very flaggy; slightly recessive to resistant	133	1,587
16	Siltstone, quartzose, very dolomitic and may be in part classed as dolomite, carbonaceous-argillaceous, slightly calcareous and pyritiferous; dark grey with slight olive tint, weathering yellow-brown; mainly indistinctly bedded, but few beds to 3 inches thick; fine to coarse, wavy to lenticular laminations; weathers flaggy; resistant and cliff-forming	33	1,454
15	Siltstone, quartzose, carbonaceous-argillaceous, pyritiferous, very dolomitic, in part may be classed as silty dolomite, calcareous; medium to dark grey to pale yellowish brown, weathering yellowish grey-brown; thin- to medium-bedded, up to 2 feet thick; thin beds contain fine, regular, light grey laminations, thicker beds faintly to non-laminated; ripple-marks in talus samples; medium beds form 20-foot zones at top and bottom of interval; unit forms base of light yellow-brown-weathering strata occupying upper quarter of mountain; recessive to slightly recessive	100	1,421

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
14	Siltstone to silty limestone, quartzose, carbonaceous, possibly argillaceous; very dolomitic in part; carbonate finely crystalline; medium dark grey, weathering dark greyish brown; mainly indistinctly bedded, few beds to 3 inches thick; unit displays fine to coarse, regular to lenticular, light grey sandy to silty laminations; strata resemble both the Whistler and Phroso Siltstone Members of other regions; poorly preserved, indeterminate pelecypods in upper half; weathers very shaly; resistant to slightly recessive	103	1, 321
13	Siltstone to silty dolomite, quartzose, carbonaceous-argillaceous, slightly calcareous; medium dark grey, weathering grey-brown to yellow-grey-brown; thin- to medium-bedded, up to 10 inches thick; thin beds display fine, light grey, regular laminations; thicker beds faintly to non-laminated; thin beds weather flaggy; slightly recessive to resistant	44	1, 218
12	Siltstone, quartzose, calcareous, dolomitic in part, carbonaceous-argillaceous, possibly pyritiferous; medium dark grey, weathering yellowish grey-brown; indistinctly bedded; unit contains fine to coarse, regular to wavy, lenticular, light grey, sandy quartzose laminations; poorly preserved pelecypod casts in lower 5 feet; weathers flaggy in $\frac{1}{2}$ - to 1-inch thick slabs; resistant	59	1, 174
11	Siltstone, quartzose, very carbonaceous-argillaceous, very dolomitic in part and may be classed as silty calcareous dolomite; carbonate very finely crystalline; dark grey, weathering dark yellow-grey-brown; thin-bedded, up to 2 inches, few beds in lower half, up to 10 inches thick; unit contains fine, light grey, regular to lenticular laminations; weathers flaggy; black phosphatic fish? fragments; resistant	100	1, 115

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
10	Siltstone, quartzose, very calcareous and dolomitic, and may in part be classed as silty limestone and silty dolomite, carbonaceous-argillaceous possibly pyritiferous; medium to medium dark grey with slight brown tint, weathering dark yellowish grey-brown to rusty brown; thin- to medium-bedded, with few beds up to 6 inches thick; fine, regular to slightly wavy, light grey laminations throughout; in part micro-cross-laminated; few thin beds or "bands" of comminuted fossil material may be in part silicified; weathers shaly to flaggy; resistant	150	1,015
9	Siltstone to silty calcareous dolomite, quartzose, very carbonaceous-argillaceous, slightly pyritiferous; carbonate very finely crystalline; dark grey, weathering dark grey-brown to rusty brown; thin- to medium-bedded, up to 6 inches thick; displays fine to coarse, regular to wavy, lenticular, light grey laminations; micro-cross-laminations in part; weathers shaly to flaggy; resistant	150	865
8	Siltstone, quartzose, dolomitic, calcareous, and may be in part classed as silty calcareous dolomite; very carbonaceous-argillaceous, possibly pyritiferous; dark grey, weathering yellowish brown to rusty brown; thin- to medium-bedded, up to 4 inches thick; fine, regular to wavy laminations; weathers flaggy; resistant	71	715
7	Siltstone, quartzose, very calcareous and dolomitic, carbonaceous-argillaceous, slightly pyritiferous; dark grey, weathering greyish brown to rusty brown; thin- to medium-bedded, up to 8 inches thick; fine to coarse, regular to lenticular, light grey laminations throughout; weathers flaggy in 1- to 2-inch thick slabs; 1-foot zone dense, well-indurated, intraformational conglomerate at top of unit; very lenticular; slightly recessive	150	644

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
6	Siltstone to silty calcareous dolomite, quartzose, very carbonaceous-argillaceous, slightly pyritiferous; dark grey, weathering rusty brown; carbonate very finely crystalline, and appears granular in part; thin- to medium-bedded, up to 6 inches thick, but averaging 2 to 3 inches; fine to coarse, light grey, wavy, lenticular laminations; breaks with sub-conchoidal fracture; unit probably gradational to underlying Phroso Siltstone Member; slightly recessive to resistant	100	494
<u>Phroso Siltstone Member (394 feet)</u>			
5	Siltstone, to silty dolomite, quartzose, very calcareous and carbonaceous-argillaceous, slightly pyritiferous; dark grey with a slight brown tint, weathering greyish brown; indistinctly bedded, but appears to be thin-bedded; fine, regular to slightly wavy, light grey laminations; weathers flaggy; unit represents probable top of Phroso Siltstone Member; slightly recessive	54	394
4	Covered interval, except for minor scattered outcrops, similar to unit 5; very recessive	100	340
3	Siltstone to calcareous dolomite, quartzose, very calcareous in part and may be classed as silty limestone, carbonaceous-argillaceous; dark grey, weathering same; indistinctly bedded, but appears thin-bedded in part; very fine, regular to wavy, lenticular, light grey laminations; few black phosphatic Lingulid shell fragments in upper 20 feet; unit weathers shaly to flaggy; slightly recessive	100	240
2	Siltstone, quartzose, slightly calcareous and dolomitic, carbonaceous-argillaceous, possibly pyritiferous; medium to dark grey, weathering greyish brown; thin- to medium- to indistinctly bedded, beds up to 8 inches thick; medium beds contain fine to coarse, light grey, wavy to lenticular to cross laminations; thin beds contain very fine, regular to slightly lenticular, light grey laminations; unit partly covered; recessive	50	140

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
1	Covered interval, except for minor scattered out-crops near top, consisting of typical finely laminated, non-calcareous, dark grey siltstone; unit forms disconformable contact with Ishbel Group; at base of unit is 4-foot thick zone of quartz sandstone containing black, sandy, phosphatic pebbles up to $1\frac{1}{2}$ inches in diameter; unit classed as Triassic but may be Permian; present unit recessive	90	90

Section 9: Grave Lake; section measured on east limb of syncline, high on ridge, east side of Sheep Mountain, southeast of Harriet Lake. (49° 51 1/4' N; 114° 46 3/4' W). Access via abandoned logging road on southeast side of Grave Creek. Stratigraphic field section GK-67-19

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
WHITEHORSE FORMATION (30 feet)			
8	Siltstone to very fine-grained sandstone, quartzose, very dolomitic, slightly carbonaceous and pyritiferous; yellowish grey to medium light grey, weathering light greyish yellow; medium-bedded, beds up to 2 feet thick; regular, coarse laminations in part; small, weathered, pyrite micro-aggregates and cubes throughout; well-indurated; breaks with subconchoidal fracture; lithology classed as transitional to Whitehorse Formation; unit forms sharp contact with overlying black, phosphatic, shale of Fernie Formation; resistant	30	805
SULPHUR MOUNTAIN FORMATION (775 feet)			
<u>Llama Member (30 feet)</u>			
7	Siltstone, quartzose, dolomitic, possibly carbonaceous-argillaceous; medium grey with slight olive tint, weathering yellowish grey-brown; medium-bedded; weathers flaggy in part; slightly recessive to resistant	30	775
<u>Vega-Phroso Siltstone Members (745 feet)</u>			
6	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous, possibly pyritiferous; medium light to light grey, weathering greyish brown to yellow-brown; thin- to medium-bedded, beds up to 1 foot thick; unit mainly thin-bedded, averaging 2 to 3 inches; thin beds contain fine to coarse, wavy to regular laminations, thicker beds (upper 20 feet) faintly to non-laminated; weathers shaly to flaggy; small drag folds in lower 50 feet; resistant	100	745

Unit	Lithology	Thickness Above Base (feet)	Height Above Base (feet)
5	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous; medium grey with olive tint, weathering greyish brown to rusty-brown; thin- to medium-bedded, beds up to 15 inches thick; thin beds contain fine to coarse, regular to lenticular laminations; thicker beds faintly to non-laminated; thin beds weather flaggy; displays cyclical bedding characteristic of member; resistant to slightly recessive	160	645
4	Covered interval, talus same as overlying and underlying units; recessive	35	485
3	Siltstone, quartzose, calcareous, dolomitic, carbonaceous-argillaceous; medium to medium dark grey with slight brown tint, weathering grey-brown to rusty brown; thin- to medium-bedded, beds up to 4 inches thick, with most beds averaging 2 inches; unit contains fine, regular to lenticular, dark grey laminations; micro-cross-laminated in part; weathers shaly to flaggy; unit 50% talus covered; recessive to slightly recessive	150	450
2	Siltstone, quartzose, very calcareous in part, dolomitic, slightly carbonaceous-argillaceous; medium to medium dark grey, weathering grey-brown to rusty brown; thin- to medium-bedded, beds up to 10 inches thick; thin beds display fine, regular to wavy laminations, some cross-laminations; thicker beds faintly to non-laminated; calcareous beds mainly in upper 50 feet; weathers shaly to flaggy; slightly recessive to resistant	100	300
1	Covered interval; talus in part consists of Phroso Member lithology; good contact with underlying Ishbel Group; contact with Vega Member indefinite, but probably occurs within upper part of interval; unit very recessive	200	200

Section 10: Ross Creek; section measured in and along sides of Ross Creek. (49° 47 3/4' N; 114° 59 1/2' W). Access via Elk River forestry road and abandoned logging road up Cummings Creek. Stratigraphic field section Gk-67-21.

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
SULPHUR MOUNTAIN FORMATION (Incomplete)			
<u>Llama Member (Incomplete)</u>			
14	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous, slightly pyritiferous; unit may be in part classed as very fine-grained sandstone; medium to dark grey, weathering yellowish grey-brown; medium- to thick-bedded, beds up to 3 feet thick; fine, regular to wavy, dark grey and light grey laminations in part; upper 5 feet show evidence of bioturbation; massive beds display spheroidal weathering; unit partly covered; resistant to slightly recessive	120	1,460
<u>Vega Siltstone Member (543 feet)</u>			
13	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous, possibly pyritiferous; medium grey, weathering yellowish grey; thin- to medium-bedded, beds up to 1 foot thick; thin beds contains fine to coarse, regular to slightly wavy laminations, some micro-cross-laminations; thicker beds non-laminated to well-laminated; resistant to slightly recessive	45	1,340
12	Siltstone, quartzose, dolomitic, very carbonaceous-argillaceous, slightly pyritiferous; dark grey to pale yellowish brown, weathering same; indistinctly to medium-bedded, few non-laminated beds up to 15 inches thick, remainder of unit contains fine to coarse, light grey, wavy to regular, laminations typical of strata in Phroso Siltstone Member of other areas; upper 60 feet partly covered; weathers shaly to flaggy; slightly recessive to recessive	174	1,295

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
11	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous, slightly pyritiferous; medium dark grey with slight brown tint, weathering yellow-grey-brown; indistinctly to thick-bedded, beds up to 3 feet thick; fine to coarse, regular to lenticular, light grey laminations; massive, but weathers flaggy near base; unit represents base of dolomitic facies; may be interfingering of facies; unit very resistant	25	1, 121
10	Siltstone to limestone, quartzose, slightly carbonaceous-argillaceous; limestone very fine to finely crystalline, bioclastic in part, consisting of comminuted brachiopod and/or pelecypod shell fragments; medium to medium dark grey, with slight brown tint, weathering greyish brown; medium- to thin-bedded; fine to coarse, wavy to regular, laminations throughout; minor cross-bedding; cut-and-fill structures near base; few black, phosphate grains and pellets; upper 30 feet partly covered; weathers flaggy; resistant to slightly recessive	149	1, 096
9	Siltstone, quartzose, very calcareous, and may be in part classed as silty limestone, carbonaceous-argillaceous, slightly pyritiferous; carbonate fine to very finely crystalline; medium dark grey, weathering greyish brown to yellow-brown; thin- to medium-bedded, beds up to 10 inches thick; beds become progressively thicker toward top; thin beds contain fine, regular to lenticular, light grey laminations, thicker beds faintly to non-laminated, lenticular; some micro-cross-bedding; weathers flaggy; unit represents probable base of member; resistant and cliff-forming	150	947
<u>Phroso Siltstone Member (797 feet)</u>			
8	Siltstone, quartzose, dolomitic, slightly calcareous, carbonaceous-argillaceous; dark grey, weathering same; thin- to indistinctly bedded; fine, regular to lenticular, light grey laminations; weathers shaly to flaggy; forms sharp contact with overlying member; unit slightly recessive	24	797

Unit	Lithology	Thickness Above Base (feet)	Height Above Base (feet)
7	Covered interval	285	773
6	Siltstone, quartzose, very calcareous, may be in part classed as silty limestone, very carbonaceous, possibly argillaceous and pyritiferous; carbonate very finely crystalline; dark grey, weathering dark brownish grey; thin- to indistinctly bedded, few beds up to 4 inches thick, fine to coarse, regular to lenticular, light grey laminations; weathers shaly to flaggy; only scattered outcrops throughout interval; recessive	220	488
5	Covered interval, except for small exposure near top consisting of siltstone, same as unit 4	40	268
4	Siltstone, quartzose, calcareous, very carbonaceous-argillaceous, possibly dolomitic; dark grey, weathering medium grey to brownish grey; mainly indistinctly bedded, but few beds up to 3 inches thick; fine, regular to lenticular, light grey laminations throughout; weathers shaly to flaggy in $\frac{1}{2}$ - to 1-inch thick plates; only sporadic outcrop; recessive	80	228
3	Covered interval	30	148
2	Siltstone, quartzose, dolomitic, slightly calcareous, very carbonaceous-argillaceous, slightly pyritiferous; dark grey, weathering same; indistinctly bedded; fine, regular to lenticular, light grey laminations; weathers shaly to flaggy; recessive	8	118
1	Covered interval; unit disconformably rests upon Ishbel Group; present unit very recessive	110	110

Section 11: Lodgepole Creek; section measured along ridge crest. (49° 14 3/4' N; 114° 54' W). Access via abandoned mining prospect road, 4 miles along west side of tributary of Lodgepole Creek. Stratigraphic field section GK-67-22

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
WHITEHORSE FORMATION (21 feet)			
10	Limestone, slightly quartzose, very finely crystalline; medium dark grey, weathering medium to light grey; thin- to medium-bedded, beds up to 6 inches thick; few coarse grains black phosphate; breaks with subconchoidal fracture; forms sharp contact with black-weathering Fernie Formation; resistant	5	535
9	Limestone, quartzose, slightly phosphatic and pyritiferous, possibly argillaceous; finely crystalline to fine- to coarse-grained, partly bioclastic; quartz fraction coarse-grained; medium dark grey, weathering medium to light grey; medium-bedded, beds up to 10 inches thick; unit fossiliferous-rhynchonelloid brachiopods, gastropods, and <i>Alectryonia?</i> sp., GSC loc. 79362; upper beds phosphatic and emit sulphurous odour upon fracture; breaks with subconchoidal fracture in part; resistant	11	530
8	Dolomite, slightly silty quartzose, slightly calcareous; very finely crystalline; medium light grey to light olive-grey, weathering very light grey; mottled in part; medium-bedded; subconchoidal fracture; unit forms base of Whitehorse Formation; resistant	5	519
SULPHUR MOUNTAIN FORMATION (514 feet)			
Llama Member (15 feet)			
7	Siltstone to very fine-grained sandstone, quartzose, very dolomitic, slightly pyritiferous; medium grey to light olive-grey, weathering yellowish orange; medium- to thick-bedded, beds up to 2½ feet thick; coarse colour laminations and banding in part; unit probably gradational to Whitehorse Formation; sharp lithologic break with underlying Vega Siltstone Member; very resistant	15	514

Unit	Lithology	Thickness (feet)	Height Above Base (feet)
<u>Vega-Phroso Siltstone Members (499 feet)</u>			
6	Siltstone, quartzose, very dolomitic, carbonaceous-argillaceous; medium dark grey with slight olive-brown tint, weathering dark greyish brown; thin to medium-bedded, beds up to 10 inches thick; thin beds display fine, regular to wavy laminations, thicker beds faintly to non-laminated; unit displays typical cyclical bedding of member but has larger number of thin laminated beds than at other localities; resistant to slightly recessive	25	499
5	Siltstone, similar to unit 6 except bedding much thinner, unit ends typical Vega facies, underlying unit probably transitional between Phroso and Vega Member; unit is resistant	50	474
4	Siltstone, quartzose, dolomitic, carbonaceous-argillaceous; medium dark grey, weathering brownish grey to yellowish grey-brown near base; indistinctly to medium-bedded, few recognizable beds up to 10 inches; unit displays fine regular to slightly wavy laminations; weathers shaly to flaggy; slightly recessive	115	424
3	Covered interval, talus and single outcrop similar to lithology in overlying unit; recessive	92	309
2	Siltstone to silty shale, quartzose, dolomitic, calcareous in part, carbonaceous-argillaceous; medium dark grey to dark yellowish brown, weathering dull grey-brown; fine to coarse, light grey, regular to wavy, lenticular laminations throughout; in part displays micro-cross-laminations; weathers shaly to flaggy; recessive	48	217
1	Covered interval, talus similar to unit 2, except weathers more shaly; contact with Ishbel Group not precise but can be placed within interval of 1 to 2 feet; contact of Phroso Siltstone Member if present may lie within unit; recessive	169	169

