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Besa River  
Formation

Rock-Eval, litho-geochemistry, gamma ray spectrometry, thermal maturity, X-ray diffraction analysis, and organic carbon isotope geochemistry of the Besa River Formation, west-central Liard Basin, British Columbia (94N/14)

Filippo Ferri and Julito Reyes



Ministry of  
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**Front cover:** Looking northeast along the Caribou Range showing the gully exposing the measured Besa River Formation section. The base of the section is just below the rock exposure at the bottom of the photograph.  
**Photo by Filippo Ferri.**

Appendices, including datafiles, for this GeoFile can be downloaded from  
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# Rock-Eval, lithochem, gamma ray spectrometry, thermal maturity, X-ray diffraction analysis, and organic carbon isotope geochemistry of the Besa River Formation, west-central Liard Basin, British Columbia (94N/14)

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**Keywords:** Besa River Formation, shale gas, Liard basin, Horn River Formation, Horn River basin, Devonian, Mississippian

## Summary

Middle Devonian to Lower Carboniferous shales and siltstones of the Besa River Formation that are exposed in the Caribou Range of west-central Liard Basin (Fig. 1) are lithologically similar to time-equivalent shale-gas bearing rocks in the subsurface of the eastern Liard Basin and, farther east, in the Horn River Basin (Fig. 2). Complimenting a nearly identical data set obtained from the Besa River Formation in southern Liard Basin (Ferri and Reyes, 2019) and previous investigations (Ferri et al., 2011a, b), herein we present the full dataset from a continuous stratigraphic section that we measured and systematically sampled in the Caribou Range of northernmost British Columbia (Figs. 3, 4). This measured section and dataset will provide a reference for the Besa River Formation in central Liard Basin.

The UTM coordinates (NAD 83, Zone 10) for Caribou Range section are: 1) base, 367107E 6643192N; 2) 60 m stratigraphic height, 367176E 6643180N; 3) 100 m stratigraphic height, 367213E 6643151N; 4) 150 m stratigraphic height, 367266E 6643094N; 5) 233 m stratigraphic height, 367420E 6643025N; 6) 285 m stratigraphic height (top), 367496E 6642948N.

In the accompanying files ([BCGS\\_GF2019-11.zip](#)) we summarize our analytical methods (Appendix 01), Rock-Eval, lithochem, stable carbon (organic) isotope geochemical, gamma ray spectrometry, thermal maturity, X-ray diffraction, and gamma ray spectrometer data (as Microsoft Excel spreadsheets; Appendix 02), and graphic logs, lithologic descriptions, and images of representative rock types (Appendix 03).

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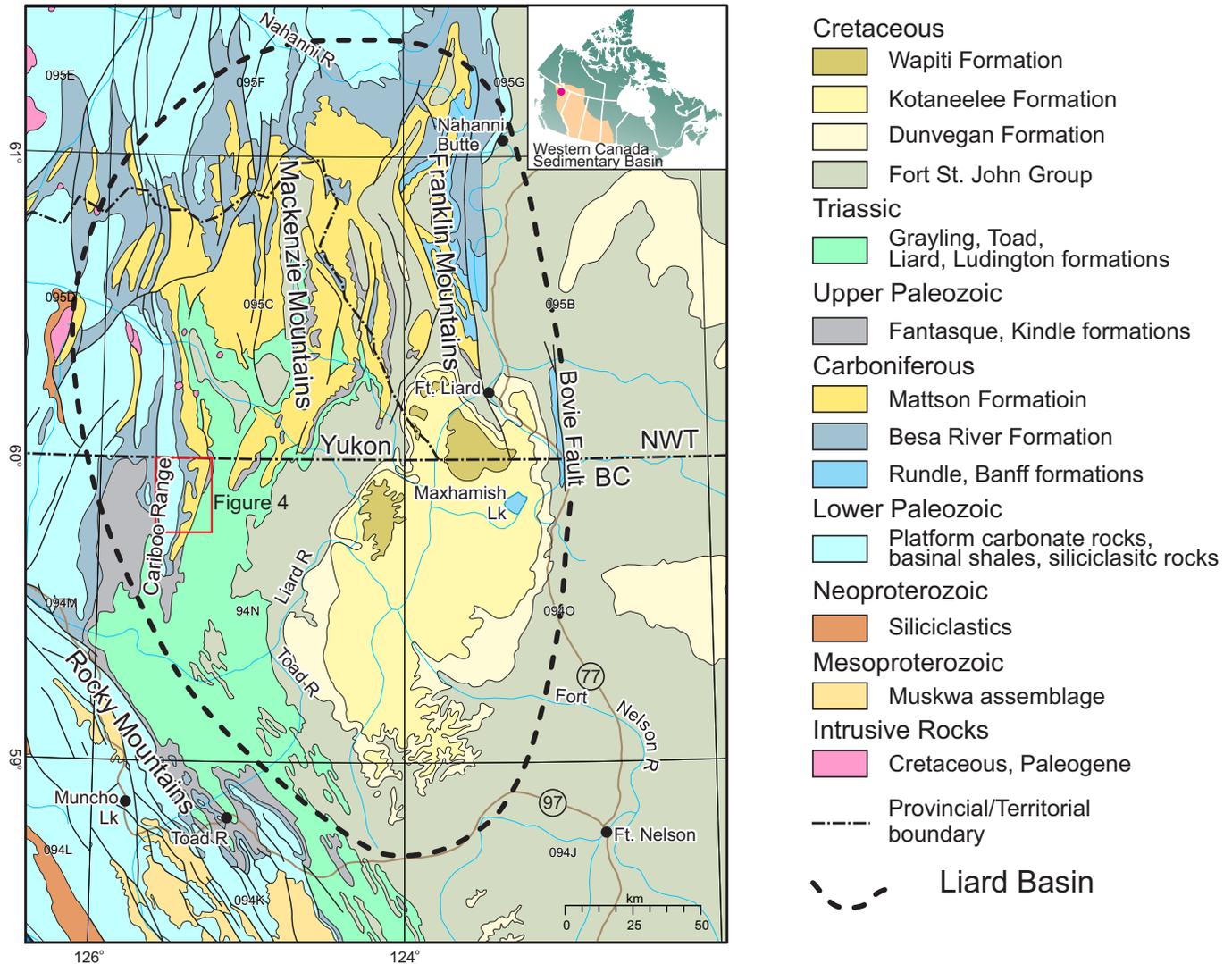
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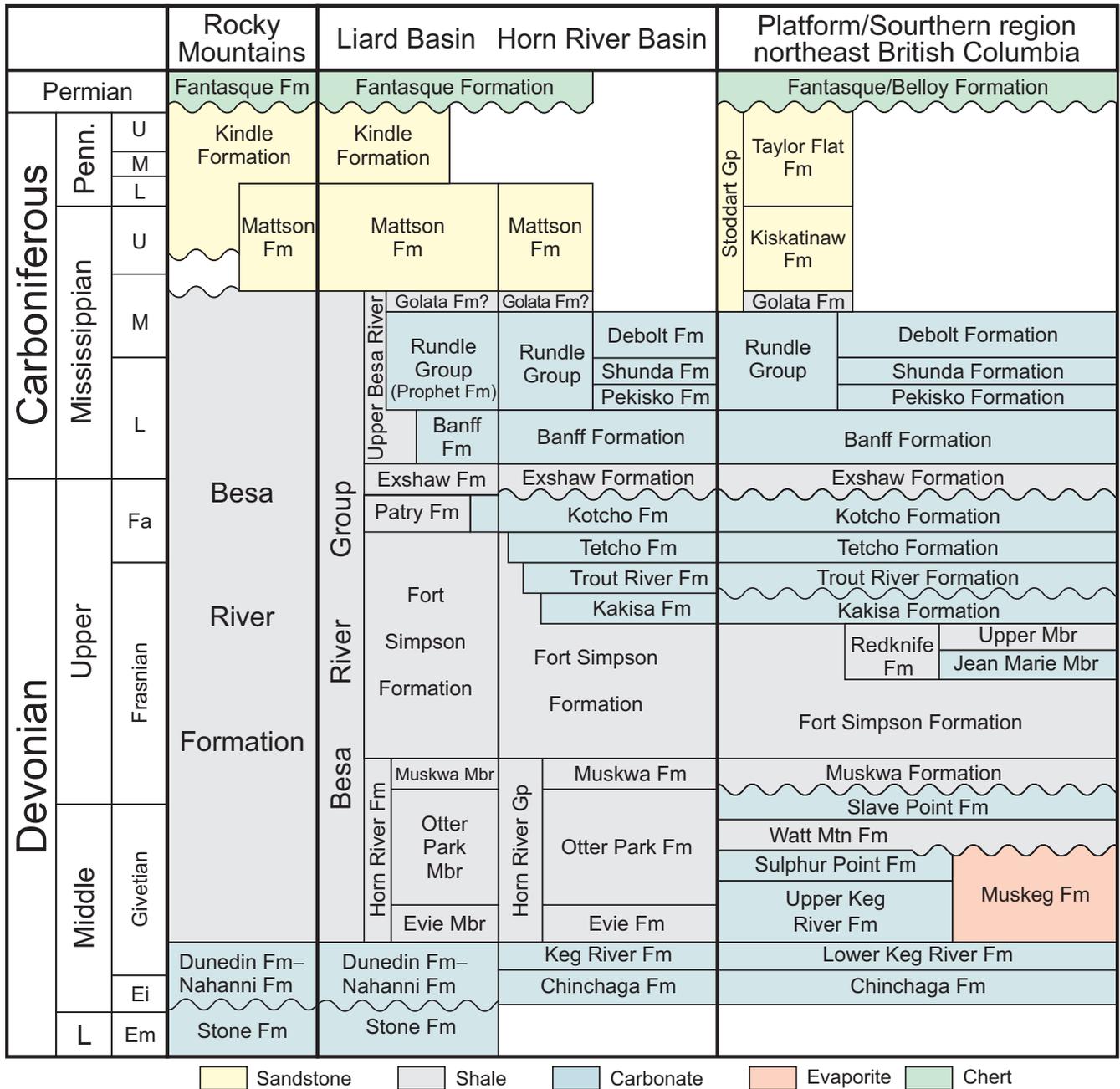
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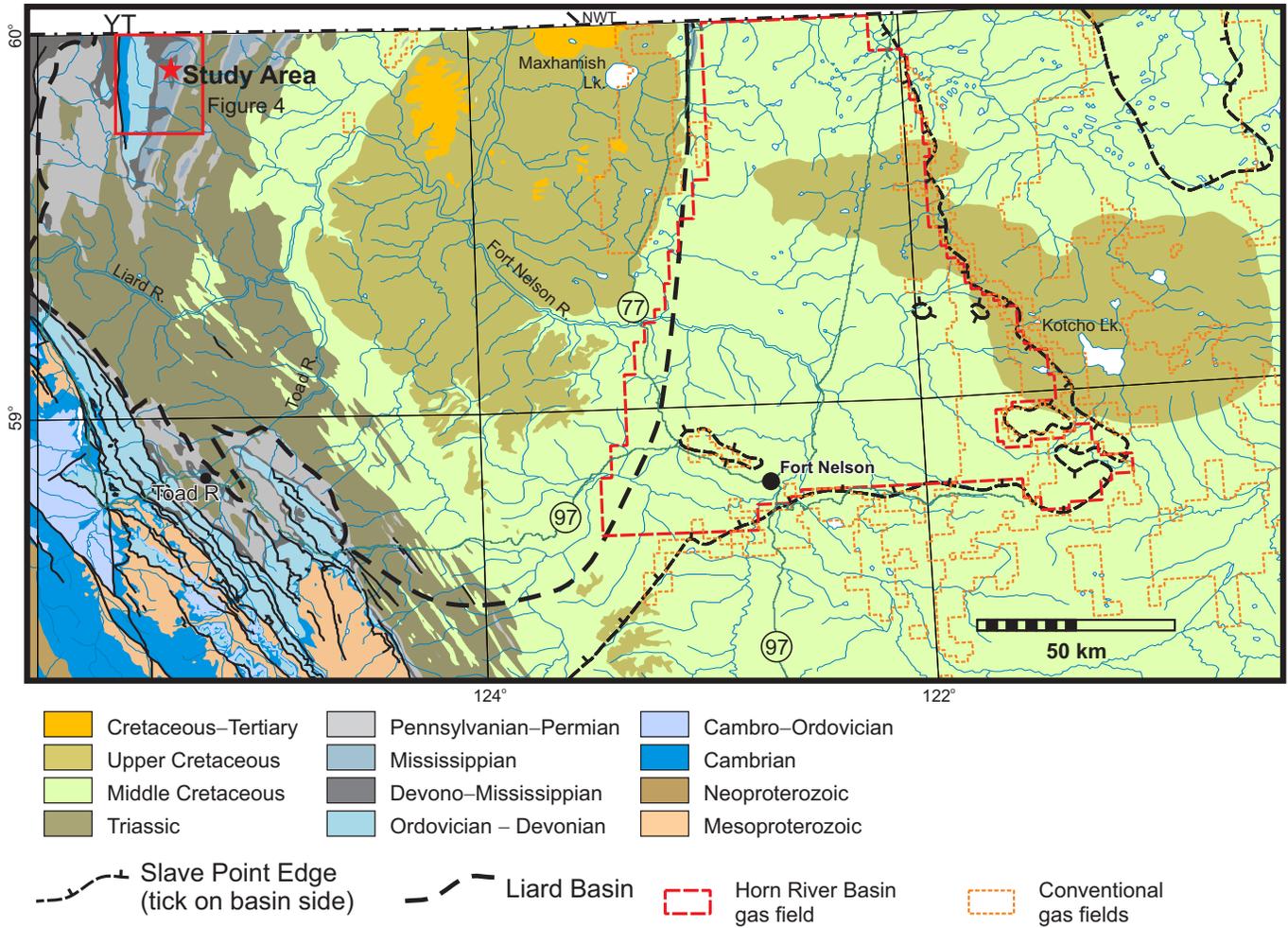
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**Fig. 1.** Geological map of northeastern British Columbia, southeastern Yukon and the southwestern Northwest Territories, showing the general outline of the Liard Basin. After Wheeler and McFeely (1991).



**Fig. 2.** Stratigraphic units in the Rocky Mountains, the Liard basin, the Horn River basin, and platform successions to the east, illustrating correlations between major late Paleozoic units along the western margin of the Western Canada Sedimentary Basin. Middle to late Paleozoic carbonate rocks on the east, ‘shale out’ westward to fine-grained siliciclastic rocks of the Besa River Formation.



**Fig. 3.** Location of study area in northernmost British Columbia, straddling the Cordillera and the adjacent undeformed portion of the Western Canada Sedimentary Basin. The outline of the Liard Basin is taken from Mossop et al. (2004). Also shown are the conventional and unconventional gas fields as defined by the BC Oil and Gas Commission.

Ferri and Reyes

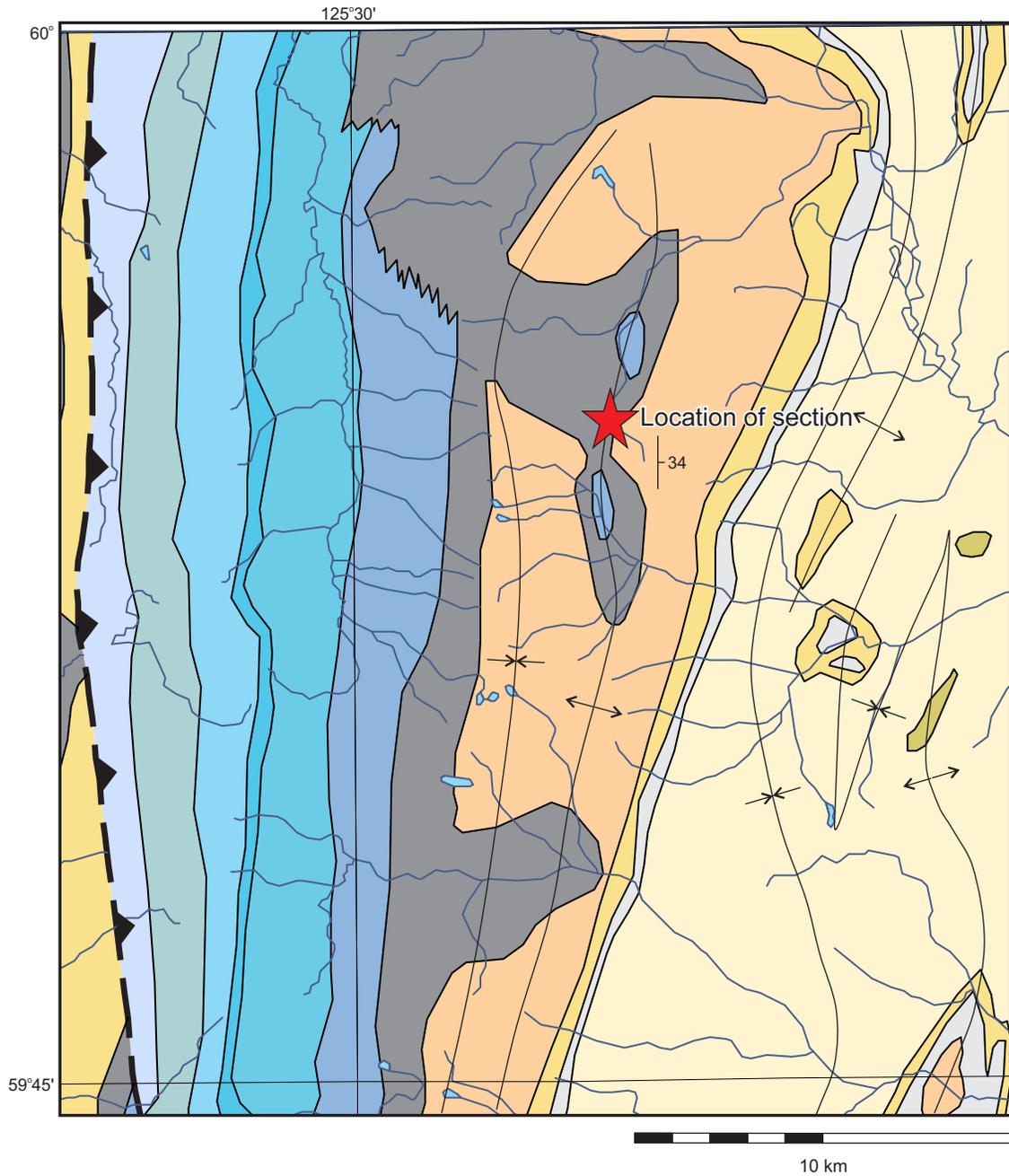


Fig. 4. Geology of the area immediately surrounding the Besa River Formation section. Geology from Taylor and Stott (1999).

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