

Figure 1. Southwest Fort Norman map area (NTS 96-C-SW) showing seismic lines on record with the National Energy Board (NEB) that were used to augment the bedrock geology interpretation. Line names are provided in the digital data files.

Abstract

The southwest quadrant of the Fort Norman map area (NTS 96-C) encompasses hilly country at the transition from the Mackenzie Plain to the eastern Mackenzie Mountains, Northwest Territories. The area is well forested and dissected by numerous tributaries of the Keele River. Limited bedrock exposures exist along stream banks and higher ridges. Broad folds dominate the map area, with the Summit Creek Fault separating Devonian and older strata to the southwest from Cretaceous to Paleocene strata to the northeast. Although most structures are delineated by bedrock exposures, some structures in the younger strata have been located with the assistance of public-domain seismic-reflection profiles, archived with the National Energy Board. Industry exploration in the area has targeted coal seams in the Summit Creek Formation and petroleum in buried Cambrian or Devonian strata.

Résumé

Le quadrant sud-ouest de la région cartographique de Fort Norman (SNRC 96-C) couvre un paysage montagneux dans la zone de transition entre la plaine du Mackenzie et la partie est des monts Mackenzie (Territoires du Nord-Ouest). La région présente un bon couvert forestier et est dissectée par de nombreux tributaires de la rivière Keele. Des affleurements limités du socle rocheux sont présents le long des berges des ruisseaux et sur les crêtes plus élevées. De grands plis constituent le trait dominant de la région cartographique, avec la faille de Summit Creek, qui sépare les strates du Dévonien et de temps plus anciens, au sud-ouest, des strates du Crétacé au Paléocène, au nord-est. Bien que la plupart des structures soient délimitées par des affleurements du socle rocheux, certaines structures dans des strates plus récentes ont été situées à l'aide de profils de sismique-réflexion du domaine public, archivés par l'Office national de l'énergie. Les travaux d'exploration effectués par l'industrie dans la région ont ciblé des filons de charbon dans la Formation de Summit Creek et des hydrocarbures dans les strates enfouies du Cambrien ou du Dévonien.

96CNE	96CWN	96CSE
CGM 95	CGM 92	
96CSE	96CWN	96CNE
CGM 96	CGM 93	
96SNE	96SWN	96SSE

National Topographic System reference and index to adjoining published Geological Survey of Canada maps

Cover illustration
An exposure of poorly cemented Late Cretaceous to Paleocene sandstone and conglomerate of the Summit Creek Formation, east of Summit Creek in the Flint Stone Range, Northwest Territories. Photograph by K.M. Fallas. 2012-133

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Natural Resources Canada Ressources naturelles du Canada

CANADIAN GEOSCIENCE MAP 93

GEOLOGY

FORT NORMAN (SOUTHWEST)

Northwest Territories

1:100 000



QUATERNARY

Qs Quaternary sediment: mud, sand, and gravel; unconsolidated.

LATE CRETACEOUS TO PALEOCENE

KPSC **Summit Creek Formation:** sandstone: lithic arenite, very friable; interbedded with conglomerate: polymict, granules to cobbles, poorly cemented; minor shale: carbonaceous, coal; and ash tuff. Unit locally contains plant remains, and dinosaur fossils in the lower part of the unit.

LATE CRETACEOUS

KEF **East Fork Formation:** mudstone and shale: locally silty or carbonaceous, dark brown to dark grey or black, soft and crumbly, contains sideritic concretions; interbedded with minor sandstone. Lithic wacke, grey to brown, very thin to thin-bedded, friable, laminated, ripple marks, rip-up clasts, and minor trace fossils; and pebble conglomerate: locally occurs at base of unit.

KLB **Little Bear Formation:** sandstone: lithic wacke to quartz arenite and chert arenite, mottled grey, greenish-grey, brown, or rusty, thin- to thick-bedded, typically friable and porous, crossbedded, laminated, ripple marks, graded bedding, locally bioturbated; interbedded with mudstone and shale: somewhat silty, dark grey to brown or black, crumbly and soft, minor sideritic concretions, and minor coal.

KSR **Slater River Formation:** shale and mudstone: dark brown to dark grey, black, or rusty-brown, soft, crumbly, and friable, sideritic concretions common, rare fish scales; minor bentonite and ash tuff: white to yellow, pale green, or orange-brown; and minor sandstone: lithic wacke, brown, grey, or rusty, very thin- to thin-bedded, crosslaminated, and bioturbated.

DEVONIAN

DI **Imperial Formation:** shale: locally silty, dark grey to greenish-grey, fissile; interbedded with siltstone: locally micaceous or calcareous, greenish-grey to purplish-brown, laminated, bioturbated; and sandstone: lithic wacke to quartz arenite, micaceous, locally calcareous or glauconitic, grey to greenish-grey or brown, very thin- to medium-bedded, laminated and crosslaminated, abundant and diverse trace fossils; and minor limestone: bioclastic, grey to brown or orange, diverse fossil assemblage.

DHR **Horn River Group:** shale: carbonaceous or petrolierous, calcareous to siliceous, locally silty, dark grey or black, weathers grey, black, brown, or rusty, locally fossiliferous; minor limestone: dark grey with tentaculitids, interbedded with shale at base of unit.

DHu **Hume Formation:** limestone: wackestone to grainstone, fossilstone, medium to dark grey or brownish-grey, typically weathers light grey, thin- to very thick-bedded, parallel to irregular or nodular bedded, fossiliferous with abundant and diverse assemblage. Unit is thicker bedded and cliff-forming in upper part.

DBR **Bear Rock Formation:** limestone breccia: variably dolomitic and petrolierous, angular clasts range from granule- to boulder-sized, greyish-brown to grey, weathers light grey, vuggy, massive and rubby with rare bedded intervals of laminated carbonate, tends to form hoodoos.

ORDOVICIAN TO SILURIAN

OSMK **Mount Kindle Formation:** dolostone: dolowackestone to dolopackstone and dolofossilstone, siliceous and cherty, light to dark grey or brownish-grey fresh and weathers light grey, vuggy, massive and rubby with rare bedded intervals of laminated carbonate, tends to form hoodoos.

CAMBRIAN TO ORDOVICIAN

COFM **Franklin Mountain Formation, upper member:** dolostone: crystalline dolostone, commonly cherty and siliceous, cream to beige or grey, weathers white to light grey, very thin- to thick-bedded, vuggy and nodular, locally stromatolitic, bioturbated, intracast-bearing, or oolitic.

- Geological contact
- Approximate
- Inferred
- Concealed
- Drift contact
- Approximate
- Normal fault, symbol on hanging-wall side
- Inferred
- Concealed
- Thrust fault, symbol on hanging-wall side
- Approximate
- Inferred
- Concealed
- Anticline, upright
- Defined
- Approximate
- Inferred
- Concealed
- Syncline, upright
- Approximate
- Inferred
- Concealed
- Inclined anticline, upright, shorter arrow on steeper limb
- Inferred
- Visited outcrop, no measurements
- Outcrop observed remotely from ground or air
- Bedding, horizontal
- Bedding strike and dip, inclined, upright
- Evidence for younging direction known
- Evidence for younging direction known, estimated measurement
- No evidence for younging direction
- Fossil locality
- Mineral locality with commodity
- Measured stratigraphic section with name of section
- Petroleum well with well name
- Dry and abandoned

NOTES

The authors have updated and revised map unit terminology from the Operation Norman map (Cook and Aitken, 1977). In general, Silurian and Devonian usage follows that of Morrow (1991), and Cretaceous to Paleocene formation names are those of Dixon (1999). Cambrian to Ordovician units have recently undergone revision to their terminology, as outlined below.

Previous work by the Geological Survey of Canada in the Fort Norman map area (Cook and Aitken, 1977) subdivided the Cambro-Ordovician Franklin Mountain Formation into three informal units. In ascending order they are: *Cyclic member*, *Rhythmic member*, and *Cherty member* (Norford and Macquenn, 1975). On the present maps, these older unit names correspond, in ascending order, to informal lower, middle, and upper members of the Franklin Mountain Formation. These lower, middle, and upper members correspond to the units 1, 2, and 3 of the Franklin Mountain Formation described by Turner (2011).

For detailed information on surficial deposits, here shown as "Quaternary sediment", see Duk-Rodkin and Couch (2004).

The names Summit Creek Fault, Flint Stone syncline, Rusty Lake anticline, Brackett River syncline, and Red Dog anticline have been introduced to facilitate discussion of these structural features. The names Summit anticline, Moose Prairie anticline, Moose Prairie syncline, and English Chief syncline have been extended from the adjoining Carcajou Canyon (Aitken et al., 1974) and Dahadimi River (Douglas, 1974) maps. Thrust faults in this map area are part of the Mackenzie Mountains structural province and are interpreted to be detached within Proterozoic or Cambrian strata at depth. Seismic-reflection data reveals normal faults affecting Proterozoic and Cambrian strata at depth, as shown schematically in Figure 2, but these faults do not appear to be involved with thrust faults at surface.

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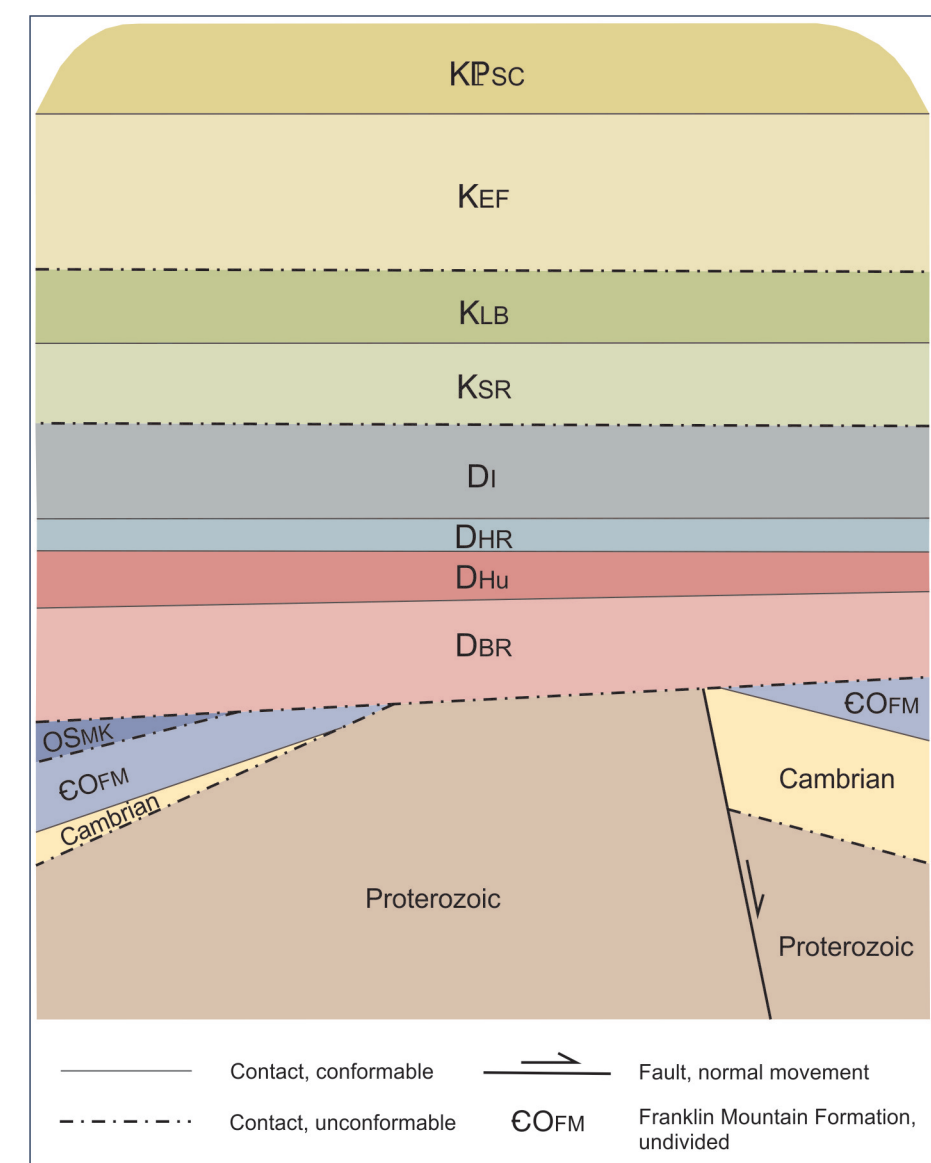


Figure 2. Schematic stratigraphic relationship diagram for southwest Fort Norman map area (NTS 96-C-SW). The major erosional unconformity between Devonian and Cretaceous units is characteristic of the Mackenzie Plain and adjacent regions.

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CANADIAN GEOSCIENCE MAP 93

GEOLOGY FORT NORMAN (SOUTHWEST)

Northwest Territories

1:100 000

2 0 2 4 6 8 km

Authors: K.M. Fallas and B.C. MacLean
Geological compilation by K.M. Fallas and B.C. MacLean, 2011–2012
Geological field observations by K.M. Fallas, 2009–2011, H.R. Balkwill, C.J. Yorath, and J.D. Aitken, 1969
Seismic data interpretation by B.C. MacLean, 2010–2012
Stratigraphic sections measured by C.J. Yorath, 1969, B.D. Ricketts, 1983, and A.R. Sweet, 1986
Geomatics by K.M. Fallas, S.D. Orzeck, and N. Raska
Cartography by S.D. Orzeck
Scientific editing by E. Inglis

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Map projection Universal Transverse Mercator, zone 10, North America Datum 1983
Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications.
Elevations in feet above mean sea level

Some geographic names on this map are not official.
Mean magnetic declination 2013, 22°48'E, decreasing 29' annually. Readings vary from 22°59'E in the NW corner of the map to 22°37'E in the SE corner of the map.
The Geological Survey of Canada welcomes corrections or additional information from users.
Data may include additional features not portrayed on this map. See documentation accompanying the data.
Additional references are included in the map information document.
This publication is available for free download through GEOSCAN (<http://geoscan.ess.nrcan.gc.ca/>).

CANADIAN GEOSCIENCE MAP 93

GEOLOGY FORT NORMAN (SOUTHWEST)

Northwest Territories



Canadian Geoscience Maps

