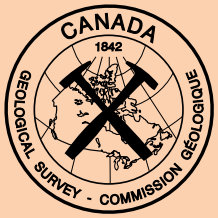

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L.J. Pyle, T.L. Allen, T.A. Fraser, L.P. Gal, T. Hadlari, A.L. Jones, Y. Lemieux, and W.G. Zantvoort

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Field-based stratigraphic studies in the Peel Plateau, Peel Plain, and adjacent areas, Northwest Territories and Yukon

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Abstract: The Peel Plateau and Peel Plain are prospective hydrocarbon exploration areas that are the focus of a four-year (2005–2009), multi-agency project within the Mackenzie corridor. In 2006, research on hydrocarbon resource potential involved fieldwork on outcrop exposures within Peel Plateau, Peel Plain, and adjacent areas of the northern Mackenzie Mountains, Mackenzie Plain, and Richardson Mountains. Data from outcrop are necessary to improve knowledge about stratigraphic and structural relationships, depositional and tectonic histories, basin evolution, and petroleum potential. In total, 27 stratigraphic sections were measured and more than 100 outcrop stations were examined within seven 1:250 000-scale map areas of the Northwest Territories and Yukon (NTS 96 E, 106 E, F, G, H, I, and L). More than 200 samples were collected to evaluate source- and reservoir-rock potential, refine biostratigraphic ages of units, and examine sedimentary petrology.

Résumé : Le plateau de Peel et la plaine de Peel sont des régions prometteuses pour l'exploration à la recherche d'hydrocarbures qui font l'objet d'un projet quadriennal (de 2005 à 2009) multi-agences dans le corridor du Mackenzie. En 2006, les recherches sur les ressources potentielles en hydrocarbures ont consisté en des travaux sur des affleurements dans le plateau de Peel, la plaine de Peel et les régions adjacentes du nord des monts Mackenzie, de la plaine du Mackenzie et des monts Richardson. Des données sur les affleurements sont nécessaires afin d'améliorer nos connaissances des relations stratigraphiques et structurales, de l'histoire sédimentaire et tectonique, de l'évolution des bassins et du potentiel pétrolier. Au total, 27 profils stratigraphiques ont été relevés et plus de 100 stations sur des affleurements ont été examinées à l'intérieur de la région couverte par 7 cartes à l'échelle de 1/250 000 (96 E, 106 E, F, G, H, I, et L du SNRC) dans les Territoires du Nord-Ouest et le Yukon. Plus de 200 échantillons ont été prélevés en vue d'évaluer le potentiel en roches mères et en roches réservoir, de préciser les âges biostratigraphiques des unités et d'examiner la pétrologie sédimentaire.

INTRODUCTION

A four-year project (2005-2009) entitled 'Regional Geoscience Studies and Petroleum Potential, Peel Plateau and Plain, Northwest Territories and Yukon' is a collaborative study by the Northwest Territories Geoscience Office (NTGO), Yukon Geological Survey (YGS), and Geological Survey of Canada (GSC). The Peel Plateau and Peel Plain are exploration areas of the Northern Canadian Mainland Sedimentary Basin along the Mackenzie corridor (Fig. 1). There is hydrocarbon potential in several stratigraphic units in these areas, but subsurface stratigraphic information is sparse, as only about 70 exploration wells have been drilled across the Peel Plateau and Peel Plain areas. New field research is necessary to expand and improve geoscience data for energy resource assessment of the Peel Plateau and Peel Plain. This will contribute to resource assessment of the Mackenzie corridor under the GSC's Secure Canadian Energy Supply Program.

Outcrop is limited in the lowlands of the Peel Plain and restricted mainly to river valleys in the Peel Plateau, but excellent exposures occur along the Cordilleran deformation front that flanks the western and southern edges of the Peel Plateau (Richardson and Mackenzie mountains, respectively). Fieldwork in 2006 took place in the Wind River (NTS 106 E) and Trail River (NTS 106 L) map areas in the Yukon and in the Sans Sault Rapids (NTS 106 H), Upper Ramparts River (NTS 106 G), Snake River (NTS 106 F), Fort Good Hope (NTS 106-I), and Norman Wells (NTS 96 E) map areas in the Northwest Territories (Fig. 1). The purpose of this report is to highlight the stratigraphic intervals and potential petroleum plays studied and summarize thematic studies undertaken during the 2006 field season. A primary goal of the 2006 field season was to collect petroleum play data for key parts of the stratigraphic section. Collection focused on source-rock potential and maturation using Rock-Eval pyrolysis and TOC analysis, samples of reservoir rocks to measure porosity and permeability, and data on stratigraphic thicknesses and depositional environments. Assessments of regional structures are reported by Lemieux et al. (in press).

STUDY AREA AND PREVIOUS WORK

The Peel Plateau and Peel Plain lie between latitude 65°N and 68°N and longitude 128°W and 136°W. They are part of the Interior Plains exploration region of the Northern Canadian Mainland Sedimentary Basin (Morrow et al., 2006). Eleven 1:250 000-scale GSC bedrock geology maps cover the Peel Plateau and Peel Plain (Aitken et al., 1969, 1982; Cook and Aitken, 1975; Norris, 1981a, b, c, d, 1982a, b; Fig. 1). These map areas also cover regions adjacent to the Peel Plateau and Peel Plain that offer the best surface exposures for stratigraphic study, including the Mackenzie and Richardson mountains and outcrop in the Mackenzie Plain (Imperial Hills). There have been a few detailed studies of the stratigraphy of the area, primarily on Devonian successions such as at Powell Creek (Lenz and Pedder, 1972; Uyeno, 1979, 1998). Details of the Lower to Middle Paleozoic succession have been less studied, but a stratigraphic framework has been developed (e.g. Morrow, 1999).

In 2005, a reconnaissance survey of the area targeted key sections and preliminary samples for Rock-Eval/TOC and conodont biostratigraphy were collected (Pyle et al., 2006a). A detailed account of the stratigraphic nomenclature of the study area and the location of type sections is summarized by Pyle et al. (2006b), so only a brief overview is provided here.

STRATIGRAPHIC FRAMEWORK

A preliminary Phanerozoic correlation chart for the Peel Plateau, Peel Plain and proximal regions of the Cordillera (Richardson and Mackenzie mountains; Fig. 2) shows the succession divided into three tectonostratigraphic assemblages, i.e. the Lower to Middle Paleozoic Franklinian Assemblage, the Upper Paleozoic Ellesmerian Assemblage, and the Mesozoic Brookian Assemblage (Norris and Hughes, 1996). In addition to these broad divisions based on tectonic history, the succession can be subdivided in terms of the unconformity-bounded, cratonic sequences of Sloss (1963). Within these sequences, the (?)Silurian-Devonian depositional sequences or assemblages of Morrow and Geldsetzer (1988) are useful for regional correlation within the Interior Platform of the Canadian Cordillera.

The Franklinian Assemblage represents a phase of passive margin sedimentation within the Mackenzie-Peel Shelf to Richardson Trough (Gabrielse, 1967; Norris, 1985; Morrow and Geldsetzer, 1988). In 2006, shallow-water deposits of the Mackenzie-Peel Shelf were primarily studied. These formations pass westward and southward to correlative slope and basinal facies preserved in the Richardson and Mackenzie mountains and Peel Plateau (Norford, 1996; Morrow, 1999; Fig. 2). On the Mackenzie-Peel Shelf, the Sauk Sequence comprises four main formations (Cambrian Mount Clark/Mount Cap formations, Cambrian Saline River Formation, and Cambrian-Ordovician Franklin Mountain Formation). The unconformity-bounded Ordovician-Silurian Mount Kindle Formation represents the Tippecanoe Sequence. The Delorme Group (Peel and Tatsieta formations) rests on a sub-Delorme unconformity that is in part continuous with the 'sub-Devonian' unconformity of the interior platform. It represents the initial transgression of the Kaskaskia Sequence. In the Mackenzie Mountains, Upper Silurian strata rest on this 'sub-Devonian' unconformity (Morrow, 1991), and the age of the Delorme Group in the Peel Plateau and Peel Plain areas still needs to be refined. Continued transgression led to deposition of the Lower to Middle Devonian carbonate succession of the Bear Rock sequence (Bear Rock, Arnica, and Landry formations) and the Hume-Dunedin sequence

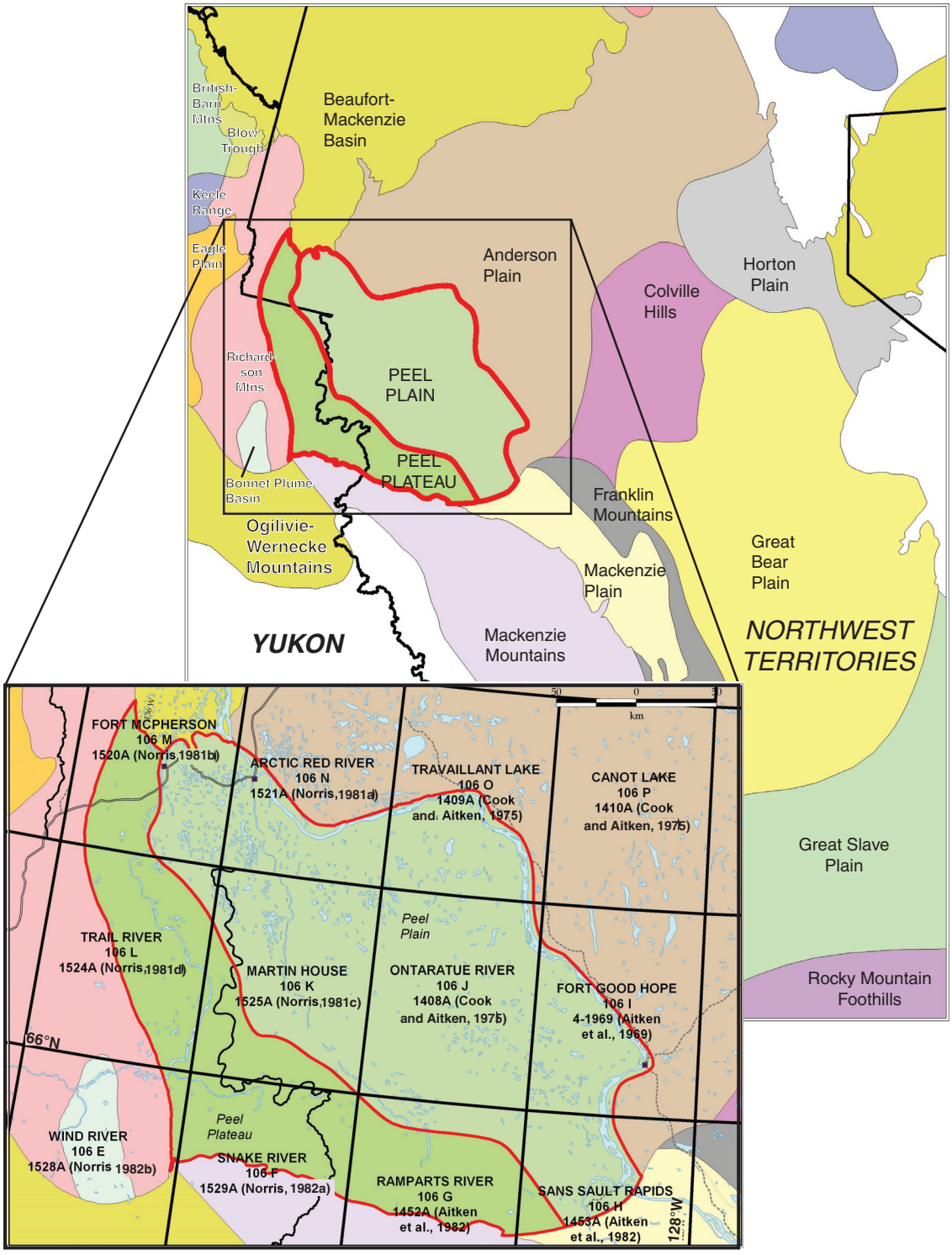
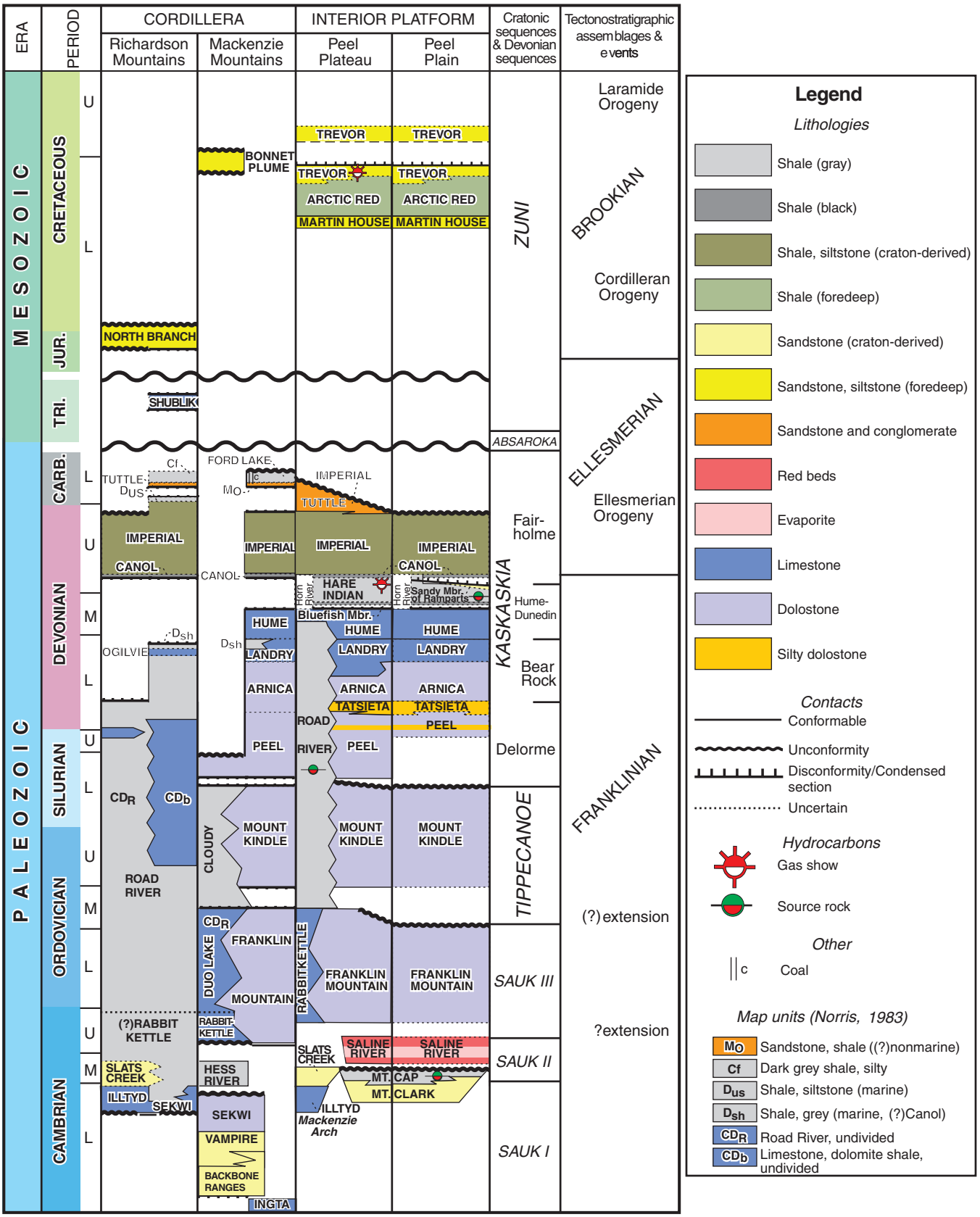


Figure 1. Location map showing the petroleum regions of the Northwest Territories and the Yukon (*modified from* Mossop et al., 2004) and Geological Survey of Canada bedrock map coverage of the Peel Plateau, Peel Plain, and adjacent areas.


ERA
PERIOD
CORDILLERA
Richardson Mountains
Mackenzie Mountains
INTERIOR PLATFORM
Peel Plateau
Peel Plain
Cratonic sequences & Devonian sequences
Tectonostratigraphic assemblages & events
MESOZOIC
PALEOZOIC
CRETACEOUS
JUR.
TRI.
CARB.
DEVONIAN
SILURIAN
ORDOVICIAN
CAMBRIAN
U
L
M
Laramide Orogeny
BROOKIAN
Cordilleran Orogeny
ELLESMERIAN
Ellesmerian Orogeny
FRANKLINIAN
(?) extension
?extension
ZUNI
ABSAROKA
KASKASKIA
TIPPECANOE
SAUK III
SAUK II
SAUK I
Fair-holme
Hume-Dunedin
Bear Rock
Delorme
BONNET PLUME
TREVOR
ARCTIC RED
MARTIN HOUSE
NORTH BRANCH
SHUBLIK
FORD LAKE
IMPERIAL
TUTTLE
CANOL
HARE INDIAN
Horn River
Sandy Mbr. of Ramparts
Bluefish Mbr.
HUME
LANDRY
ARNICA
TATSIETA
PEEL
ROAD RIVER
OGILVIE
MOUNT KINDLE
CLOUDY
DUO LAKE
FRANKLIN MOUNTAIN
RABBITKETTLE
(?)RABBIT KETTLE
SLATS CREEK
SALINE RIVER
MT. CAP
MT. CLARK
ILLTYD
HESS RIVER
SEKWI
VAMPIRE
BACKBONE RANGES
INGTA
Mackenzie Arch
Legend
Lithologies
Shale (gray)
Shale (black)
Shale, siltstone (craton-derived)
Shale (foredeep)
Sandstone (craton-derived)
Sandstone, siltstone (foredeep)
Sandstone and conglomerate
Red beds
Evaporite
Limestone
Dolostone
Silty dolostone
Contacts
Conformable
Unconformity
Disconformity/Condensed section
Uncertain
Hydrocarbons
Gas show
Source rock
Other
Coal
Map units (Norris, 1983)
Sandstone, shale ((?)nonmarine)
Dark grey shale, silty
Shale, siltstone (marine)
Shale, grey (marine, (?)Canol)
Road River, undivided
Limestone, dolomite shale, undivided

(Hume Formation, Horn River Group), which prograded across the Mackenzie-Peel Shelf. The Horn River Group (Pugh, 1983, 1993) includes the Hare Indian, Ramparts, and Canol formations.

The Ellesmerian Assemblage represents the onset of the Ellesmerian Orogeny, and transition from the Mackenzie-Peel Shelf to the Mackenzie Basin. The assemblage includes the upper part of the Kaskaskia Sequence (Fairholme sequence; Fig. 2). A major change occurs with the onset of synorogenic, siliciclastic deposition of the Upper Devonian to Mississippian Imperial and Tuttle formations, and Ford Lake shale (Richards et al., 1996). This succession is truncated by a sub-Cretaceous unconformity, which is exposed in the Upper Ramparts River and Sans Sault Rapids map areas (Aitken et al., 1982).

The Brookian Assemblage contains mainly Cretaceous rocks in the Peel Plateau, Peel Plain, and adjacent areas and corresponds to the Zuni Sequence (Sloss, 1963). It represents another phase of foreland basin sedimentation during phases of extension and compression that formed the Peel Trough (Yorath and Cook, 1981; Dixon, 1999) and that were related to the mid-Jurassic to Tertiary Cordilleran and Laramide orogenies (Norris, 1997). The succession includes the Lower to Upper Cretaceous Martin House, Arctic Red, and Trevor formations (Mountjoy and Chamney, 1969).

PETROLEUM PLAYS

In the Yukon part of the Peel Plateau and Peel Plain, Osadetz et al. (2005) identified three regions — Peel Plateau west of Trevor Fault, Peel Plateau, and Peel Plain — containing a total of eight plays: the Paleozoic Carbonate Platform Play in the Peel Plain, the Paleozoic Carbonate Margin in the Peel Plateau, the post-Hume Reef in the Peel Plain, the Upper Paleozoic Clastics Play in all three regions, and the Mesozoic Clastics Play in the Peel Plateau and Peel Plain. In the Ts'ude'hliline-Tuyetah (Ramparts River and Wetlands) Candidate Protected Area, Gal (2007) outlined the following seven established and conceptual plays: the Basal Cambrian clastics, the Cambro-Ordovician platform, the Upper Devonian clastics, the Arnica/Landry platform, the Kee Scarp, the Tuttle Formation, and Cretaceous clastics. These seven plays are continuous with plays in the present study area.

Figure 2 (opposite). Preliminary Phanerozoic correlation chart for the study area. The succession is divided into tectonostratigraphic assemblages (*after* Norris, 1997), cratonic sequences (*after* Sloss, 1963), and Devonian sequences (*after* Morrow and Geldsetzer, 1988) discussed in the text. Time scale *after* Okulitch (2004); stratigraphic data *after* Norris (1983, 1997) and Jones (2005). CARB. = Carboniferous; TRI. = Triassic; JUR. = Jurassic

OVERVIEW OF FIELD WORK

Twenty-seven measured sections and more than one hundred outcrop stations were studied in the 2006 field season (Fig. 3).

Franklinian Assemblage

A total of 16 measured sections and 12 stations were studied within rocks of the Franklinian Assemblage. Pyle and Gal (in press) provide full descriptions, stratigraphic logs, and photographs. The Cambrian Mount Clark/Mount Cap formations, the Saline River Formation, and Cambrian-Ordovician Franklin Mountain Formation were measured at Fan Creek and Powell Creek in the Sans Sault Rapids map area (NTS 106 H). Basal Cambrian siliciclastics (Mount Clark/Mount Cap formations) thin westward toward the Peel Plateau and Peel Plain from the Mackenzie Plain due to the influence of the Mackenzie Arch (Aitken et al., 1982). At Powell Creek, a unit underlying the Saline River Formation was interpreted to be the Mount Cap Formation (Fig. 4); this was not previously indicated on the NTS 106 H map by Aitken et al. (1982). The Mount Cap Formation was sampled for source- and reservoir-rock potential.

Latest Cambrian to Ordovician and Silurian carbonates (Franklin Mountain and Mount Kindle formations; Fig. 4, 5, 6) are extensive across the study area. These units were measured at 11 sections and together were more than 1200 m thick near Rumbly Creek in the Upper Ramparts River map area (NTS 106 G). The Franklin Mountain Formation is typically a fairly tight carbonate, but porous horizons of vuggy, coarse-grained dolomite occur at several sections. At one key section called Red Ridge in NTS 106 G (Fig. 5), the formation

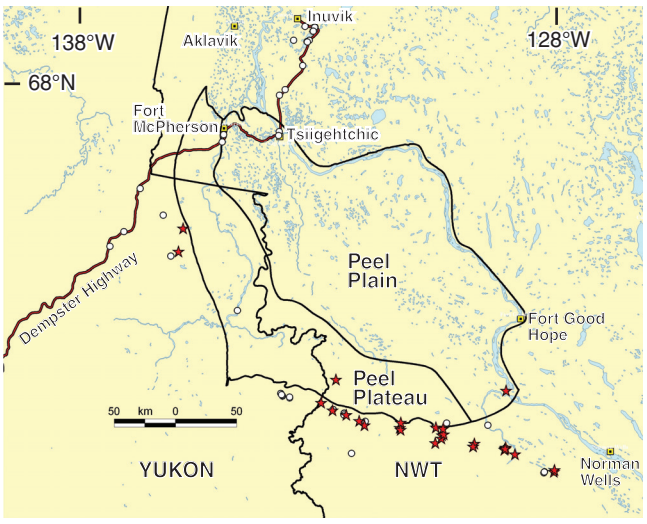


Figure 3. Peel Plateau, Peel Plain, and adjacent areas showing 2005 reconnaissance sites and stops along the Dempster Highway (white dots) and measured sections from the 2006 field season (red stars).

Figure 4. View to the southwest of an exposure opposite the measured section on Powell Creek (UTM: 509520.25E, 7237549.38N). The Mount Cap Formation is 19.5 m thick.

Figure 6. Erosional contact (at hammer head) between the Franklin Mountain and Mount Kindle formations (hammer head is 15 cm long for scale), Gayna River Section (482339.91E, 7238585.86N).

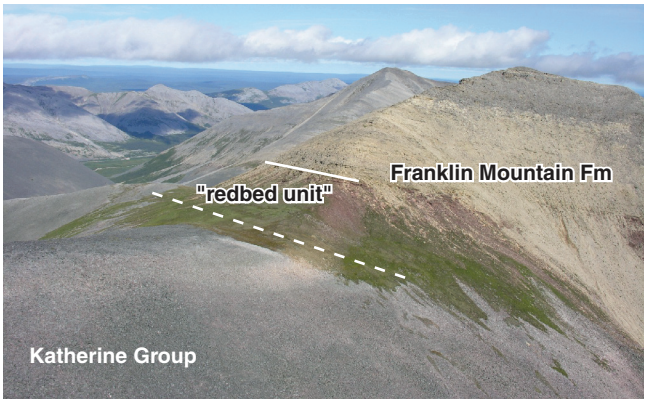


Figure 5. View to the northwest of the Red Ridge section (UTM: 449398.73E, 7239365.8N) showing the prominent lower 'redbed unit' (32.0 m thick) of the Franklin Mountain Formation.

Figure 7. View north from the lower Mount Kindle Formation. The Peel Formation is 52.5 m thick; Rumbly Creek Ridge Section (base at UTM: 387361.29E, 7250069.79N).

contains a basal redbed unit that typically is not preserved to the east, but has been reported in NTS 106 A and 106 G by Aitken et al. (1973). The Franklin Mountain Formation is unconformably overlain by the Mount Kindle Formation, which also thickens westward. Although the boundary is scree covered at most ridge localities, this prominent Sauk-Tippecanoe sequence boundary was well exposed at Gayna River (Fig. 6). The Mount Kindle Formation also contains vuggy-weathering zones that were sampled for porosity.

The possibly Late Silurian to at least Early Devonian Delorme Group (Peel and Tatsieta formations) unconformably overlies the Mount Kindle Formation. The Delorme Group was measured at six localities. The Peel and Tatsieta formations have a thickness that varies across the study area (15 to 240 m) and are present west of the Arctic Red River in NTS 106 G. These orangish-grey-weathering carbonates are silty and typically tight, with little potential as reservoir facies (Fig. 7). These formations represent the initial transgression of the Kaskaskia Sequence (Fig. 2).

Where the Delorme Group is absent in the eastern part of the study area, the Bear Rock Formation rests on the sub-Kaskaskia unconformity at the top of the Mount Kindle Formation (Fig. 8). The Bear Rock Formation consists mainly of breccia restricted to surface and near-surface strata due to partial dissolution of anhydritic carbonates. The formation is equivalent to the Arnica and Landry formations to the west, which typically overlie the Delorme Group. The Arnica Formation (Fig. 7) has a distinctly striped weathering pattern due to cyclical alternations of light- and dark-weathered carbonate units. The Arnica Formation and overlying Landry Formation form the Bear Rock sequence; their shallow subtidal to intertidal carbonates constitute a potential

carbonate platform play (e.g. Summit Creek, central Mackenzie corridor; Hansen et al., 2005). The units are continuous across the study region and have a combined thickness greater than 350 m.

The Middle Devonian Hume Formation (Hume-Dunedin sequence) is a regional marker that maintains a fairly uniform thickness (about 130 m) across the study area (Fig. 7, 8, 9). The formation becomes less argillaceous and thicker bedded upward, although this upper division becomes more poorly defined westward. The Hume Formation abruptly overlies the Bear Rock, Arnica, or Landry formations. The base of the Hare Indian Formation is sharp and erosional over the Hume Formation. The Hare Indian Formation (up to 190 m thick; Fig. 8, 9) is gradational with, and partly equivalent to, shale and carbonates of the Ramparts Formation (maximum 300 m thick). Contacts between the Hare Indian, Ramparts, Canol, and Imperial formations are gradational (Fig. 9, 10). Where the Ramparts Formation is absent, the Canol Formation conformably overlies the Hare Indian Formation. The Hare Indian and Canol formations are known source rocks, whereas the Ramparts Formation (Kee Scarp member) forms the reservoir for the Norman Wells oil field (Tassonyi, 1969). Shale samples have been collected from the Hume, Hare Indian, Canol, and Imperial formations for organic geochemistry, major element, trace element, and Sm-Nd isotopic analyses.

Figure 8. Landry-Hume Formation contact, view to the southwest (geologist for scale); Type Hume Formation Section (UTM: 454893.49E, 7246220.12N).

Ellesmerian Assemblage

A total of six sections of the Imperial Formation were measured in NTS 96 E, 106 G, H, and L. Seven other stations were examined. The type section at Imperial River was designated in NTS 96 E by Hume and Link (1945). The lower contact of the Imperial Formation is gradational with the Canol Formation (Fig. 11). The base of the Imperial Formation is marked by a thin (10–15 m) interval of recessive dark grey shale, which lacks the pyrite and chert that characterize the Canol Formation. The remainder of the thick (more than 650 m) succession of Imperial Formation (Fig. 12) comprises fine-grained sandstone and silty mudstone interbedded at large (hundreds of metres) and small (centimetres) scales. The Imperial Formation is abruptly overlain by the Tuttle Formation in the western part of the study area, or cut by the sub-Cretaceous unconformity in the east (Aitken et al., 1982). Samples were collected from the Imperial Formation for permeability, porosity, biostratgraphy (palynology), and Rock-Eval/TOC analyses. Sandstone units at the Imperial River type section are locally petroliferous.

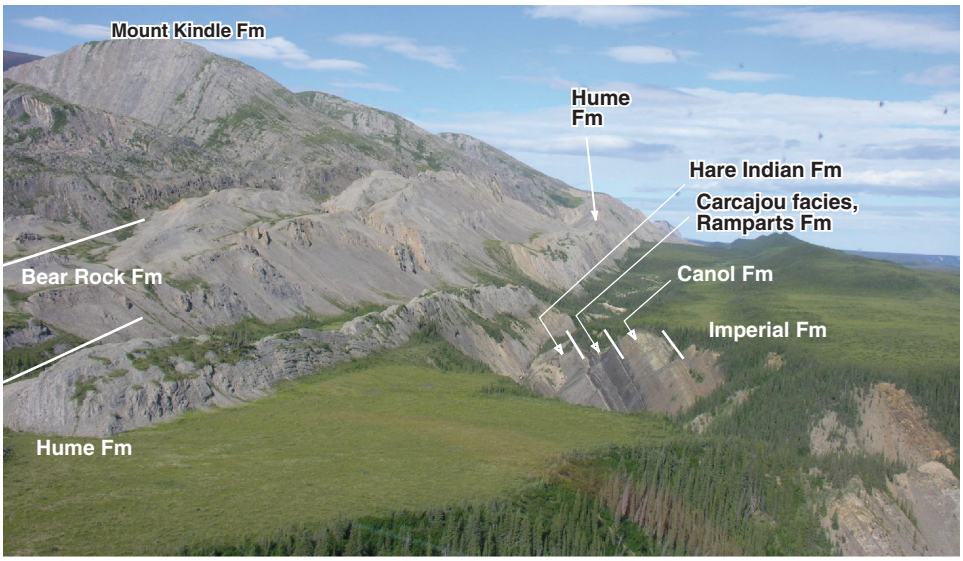


Figure 9. Aerial view to the west from the Mountain River to the ridge and canyon section (UTM: 519007.48E, 7234321.98N). The Canol Formation is 93.3 m thick.

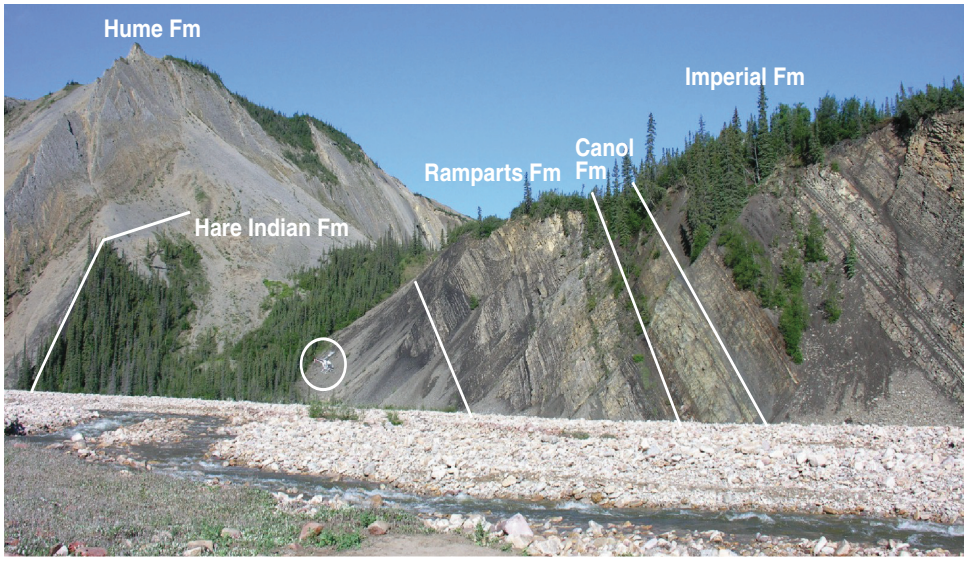


Figure 10. Hume Formation to Imperial Formation succession, view to the west side of Powell Creek (UTM: 510259.78E, 7238692.23N). The helicopter (circled) is 12 m long.

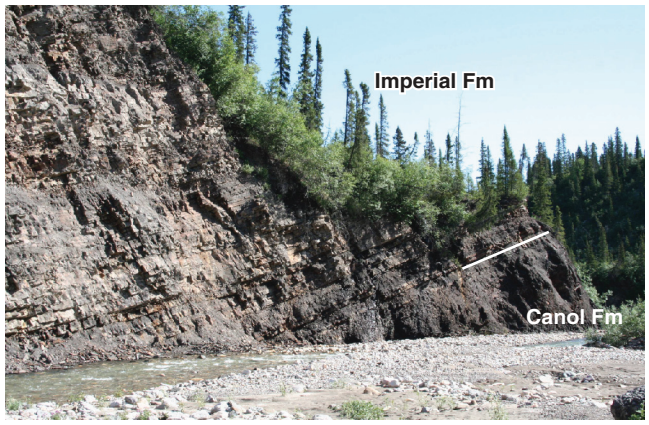


Figure 11. View east to the Canol and Imperial formations, exposed on a tributary of the Arctic Red River (UTM: 456373.0E, 7246975.0N). The exposed Canol Formation is 5 m thick.

Figure 12. View to the north of the upper Imperial Formation, exposed on a tributary of the Arctic Red River (UTM: 418009.0E, 7249973.0N). The cliff is about 150 m high.

Exposures of the Tuttle Formation are limited to the flanks of the Richardson Mountains. A lithologically equivalent map unit (Mo = Mississippian sandstone) is limited to the north flank of the Mackenzie Mountains. Two sections of the Tuttle Formation were measured along the eastern flank of the Richardson Mountains. The stratigraphic succession of Canol, Imperial, and Tuttle formations, map unit Cf (= lower Carboniferous shale), and Arctic Red and Martin House formations was examined at a total of 19 stations in the Trail River (NTS 106 L) and Wind River (NTS 106 E) map areas. Facies relationships are complex between the Imperial Formation, map unit Dus (upper Devonian shale), Tuttle Formation, and Ford Lake siltstone and shale (mapped by Norris 1981b, d). Sandstone packages of the Tuttle Formation consist primarily of fining-upward sandstone beds, massive, poorly sorted sandstone, and subordinate conglomerate and siltstone (Fig. 13; Fraser and Allen, in press). In the Trail River map area (NTS 106 L), the top of the Ellesmerian Assemblage is cut by the sub-Cretaceous unconformity or the Trevor Fault. Both the Imperial and Tuttle formations are of interest as prospective reservoir- and source-rock facies within the Upper Paleozoic Clastics play in the Peel Plateau west of the Trevor Fault, the Peel Plateau, and the Peel Plain (Osadetz et al., 2005).

Figure 13. A section of the Tuttle Formation on the Trail River (UTM: 483250.0E, 7371104.0N). The total thickness exposed is 54 m.

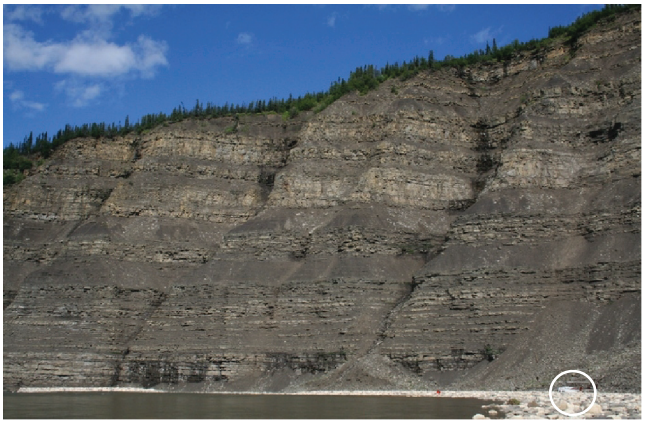


Figure 14. A section of the Trevor Formation on the Cranswick River (UTM: 359959.0E, 7287032.0N). The helicopter (circled) is 12 m long.

Brookian Assemblage

A total of five Cretaceous sections were measured in NTS 106 F, G, H, and I, including the Martin House, Arctic Red, and Trevor formations. The Cretaceous succession lies on a prominent unconformity. The Martin House Formation sandstone forms a transgressive succession, less than 50 m thick, of upper-shoreface sandstone to lower-shoreface sandstone and offshore mudstone. The Arctic Red Formation offshore mudstone is up to 1000 m thick. The Trevor Formation comprises interbedded offshore mudstone and lower-shoreface sandstone (Hadlari, 2006), as is exposed at Cranswick River (NTS 106 F, Fig. 14). A thick section of Arctic Red (about 1000 m) and Trevor (greater than 700 m) formations was examined in NTS 106 G. In addition, a short section (40 m thick) mapped as Arctic Red Formation was examined in NTS 106 L. Samples were collected from the Cretaceous succession for permeability, porosity, biostratigraphy (foraminifera), and Rock-Eval/TOC analyses. Cretaceous units are being evaluated as part of the Mesozoic Clastics Play in the Peel Plateau and Peel Plain (of Osadetz et al., 2005).

ONGOING THEMATIC STUDIES

Work on analyzing hundreds of samples and documenting and interpreting stratigraphic and structural data is in progress. More than 150 samples of organic-rich rocks were collected for Rock-Eval/TOC analyses (Gal et al., in press), more than 70 outcrop samples are undergoing porosity and permeability analyses, and sedimentary petrology studies of potential reservoir facies are underway. These new data will supplement existing thermal maturity data (vitrinite reflectance and Rock-Eval/TOC, summarized in Pyle et al., 2006a) in order to place the timing of hydrocarbon generation within the tectonic evolution of the basin, and improve petroleum play evaluations. About 100 biostratigraphic samples (conodonts, palynology, foraminifera) are being processed to provide new age constraints on the succession. This will complement legacy data from a number of Devonian sections measured and sampled for conodonts by the Geological Survey of Canada in 1971 and 1972 (T.T. Uyeno, pers. comm., 2006). Improved correlation between the surface and subsurface using sequence stratigraphy and biostratigraphy is ongoing.

Anticipated outputs

Results from thematic studies will contribute new qualitative and quantitative geoscience data to assess the hydrocarbon resource potential of the Mackenzie corridor. A final synthesis volume on the geology of the Peel Plateau and Peel Plain, in digital format, will contain a compilation of stratigraphic and biostratigraphic data and interpretations, as well as results from new structural mapping and geophysical interpretation. Current information about the project and publications can be found at http://www.nwtgeoscience.ca/petroleum/PeelPlateau.html.

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