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DESCRIPTION

GEOLOGIC SETTING

The Sekwi Mountain area is underlain by unmetamorphosed sedimentary strata ranging in age from Neoproterozoic to Cretaceous. This 900 million year record reflects sedimentation on the supercontinent of Rodinia, the breakup of this supercontinent coincident with Neoproterozoic glaciation, subsequent passive margin sedimentation on the margin of Laurentia (ancestral North America) and Devono-Mississippian extensional tectonism. The Mesozoic docking of terranes far to the west led to foreland fold- and thrust-belt deformation that affected the present area in Cretaceous-Tertiary time.

The northeast third of the area is underlain by large areas of gently dipping strata within the hanging-wall of the Plateau Fault. The oldest units comprise carbonate rocks of the upper Little Dal Group, overlain by clastic and carbonate rocks of the Neoproterozoic Coates Lake Group in turn succeeded by glaciogenic fine- to coarse-clastic rocks of the Rapitan Group (Sturtian glaciation (Aitken, 1991)). The Coates Lake and Rapitan groups were deposited in an extensional environment related to the continental breakup of Rodinia, and form the initial deposits of the Cordilleran margin. Subsequent Neoproterozoic deposits (Twitya, Sheepbed, Gametrail, Blueflower formations) reflect cyclic deposition of clastic and carbonate strata along this margin interrupted by a younger glacial event (Tepee and Ice Brook formations; Marinoan glaciation (Aitken, 1991)).

The central third of the area is underlain by a regional synclinorium exposing Paleozoic strata. A sudden and thick influx of shallow-water quartz sand (Backbone Ranges Formation) marks Ediacaran-Cambrian time. Succeeding units are dominated by shallow-water dolostone (Sekwi, Franklin Mountain, Mount Kindle, Tsetso, Camsel, Sombre, and Arnica formations) capped by open-marine limestone (Landry, Headless and Nahanni formations). The entire Paleozoic shallow water sequence, known regionally as Mackenzie Platform, is disrupted by incursions of shale in the middle Cambrian (Hess River and Rockslide formations) and Ordovician-Silurian (Duo Lake Formation). The platform is overlain by Upper Devonian shale and fine clastic rocks (Canol, Imperial formations). Regionally, Paleozoic formations thin towards the northeast, and are thinnest along a linear element known as Mackenzie Arch (extreme northeast of Sekwi Mountain area). Thinning is combined with major lacunae beneath Ediacaran-Cambrian and upper Cambrian strata so that younger Proterozoic units disappear entirely at Mackenzie Arch.

In the southwest part of the Sekwi Mountain area Mackenzie Platform strata change facies to deeper-water clastic rocks and limestone that comprise the eastern parts of the Selwyn Basin (Vampire, Hess River, Rabbitkettle, Duo Lake, Steel, Grizzly Bear, Sapper and Hailstone formations). These are overlain by Upper Devonian fine- to coarse-grained, chert-bearing, clastic strata (Hawthorne, Misfortune, Portrait Lake, Prevost, and 'Itsi' formations) that derive their detritus from Devono-Mississippian extensional tectonism and block uplift to the west. Finer-grained easterly equivalents (Canol, Imperial formations) may be of mixed provenance, both from the west and from more distant compressional orogenesis in north Yukon. The end of this tectonism is signalled by deposition of late Mississippian relatively clean quartz sandstone (Heritage Trail Formation) succeeded by a mixture of shale and limestone (Keele Creek and Fourway formations), or shale and chert (Mt. Christie Formation).

The youngest strata in the region are fluvial, coal-bearing mid-Cretaceous, shale and sandstone derived from Cordilleran orogenesis. They are severely deformed, and lie within a fault-bounded panel in the central part of the area. Their age overlaps that of post-tectonic mid-Cretaceous plutons in the southwest part of the area, suggesting they were deposited as the plutons were being emplaced at depth, and that deformation migrated through the central part of the Sekwi Mountain area in Cretaceous-Tertiary time. The structural geology of the region, including the origin of the Plateau Fault and depths to detachment are described in companion Open Files (OF 6593, 6594; Gordey et al, 2011a,b).

Economically, the area hosts a variety of occurrences (NORMIN, 2011) dominated by carbonate-hosted Pb-Zn, as well as significant Kupferschiefer(?) Cu of the Coates Lake Group (e.g. Redstone copper). Regionally, mid-Cretaceous plutons are favourable for W-Cu-Zn skarns (e.g. Mactung, immediately to west), Devono-Mississippian strata for barite-Pb-Zn-Ag deposits (e.g. Macmillan Pass to southwest), Ordovician-Silurian shales for SEDEX Pb-Zn (e.g. Howards Pass to south) and Proterozoic strata (Rapitan Group) for iron formation (e.g. Crest deposit to northwest). The Plateau Fault, earlier proposed as a potential large hydrocarbon trap, is now thought to have minimum resource potential as a result of this mapping and related work (MacNaughton et al, 2008).

MAP COMPILATION

The first map of the Sekwi Mountain area was by Blusson (1972) at 1:250,000 scale. This work has been digitized and integrated with new geological mapping and observations at selected localities undertaken by the Northwest Territories Geoscience Office (NTGO) and Geological Survey of Canada (GSC) as part of the Sekwi Mountain Project. Preliminary detailed maps for four areas and a preliminary version of this compilation were published by Roots and Martel (2008).

Since the work by Blusson (1972), numerous studies in the region have indicated changes in stratigraphic nomenclature and identified new formations that are incorporated into this compilation. Aitken (1989, 1991) formalized nomenclature for the uppermost Proterozoic succession and documented younger Proterozoic glacial deposits. Although the Rapitan Group was formally subdivided by Eisbacher (1978), a narrower definition used in this compilation reflects current practice. Renaming of some Paleozoic units, such as Ronning Group, Delorme Group, and Tsetso Formation, follows the usage of Morrow (1991, 1999). Cecile (1982, 2000) formally subdivided Middle Cambrian to Carboniferous strata in adjacent Niddery Lake map area.

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REFERENCES

Abbott, J.G., 1983. Geology of the Macmillan Fold Belt; Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1983-1.

Aitken, J. D., 1989. Uppermost Proterozoic formations in the central Mackenzie Mountains, Northwest Territories; Geological Survey of Canada, Bulletin 368, 26 p.

Aitken, J. D., 1991. The Ice Brook Formation and post-Rapitan, late Proterozoic glaciation, Mackenzie Mountains, Northwest Territories; Geological Survey of Canada, Bulletin 404, 43 p.

Blusson, S.L., 1972. Geology, Sekwi Mountain, Northwest Territories and Yukon Territory; Geological Survey of Canada, Map 1333A, scale 1:250,000

Cecile, M.P., 1982. The Lower Paleozoic Misty Creek Embayment, Selwyn basin, Yukon and Northwest Territories; Geological Survey of Canada, Bulletin 335, 78 p.

Cecile, M.P., 2000. Geology of the northeastern Niddery Lake map area, east-central Yukon and adjacent Northwest Territories; Geological Survey of Canada Bulletin 553, 120 p.

Eisbacher, G. H., 1978. Re-definition and subdivision of the Rapitan Group, Mackenzie Mountains; Geological Survey of Canada, Paper 77-35, 21 p.

Gordey, S.P., MacDonald, J., Roots, C.F., Fallas, K.M. and Martel, E., 2011a. Regional cross-sections, detachment levels and origin of the Plateau Fault, central Mackenzie Mountains, Northwest Territories; Geological Survey of Canada, Open File 6593, 1:100 000 scale.

Gordey, S.P., Roots, C.F., Martel, E., MacDonald, J., Fallas, K.M. and MacNaughton, R.B., 2011b. Bedrock geology, Mount Eduni (106A) Northwest Territories; Geological Survey of Canada, Open File 6594, scale 1:250 000.

Hardy, J.L. and Campbell, C.J., 1981. Majesty option, NWT: geology, geophysics, geochemistry and diamond drilling, 1980; submitted by Rio Tinto Canadian Exploration Ltd.; NWT Assessment Report 081237

Hitchins, A.C., 1975. Sekwi Brock Property (Dar 1-28 claims); submitted by AMAX Exploration, Inc.; NWT Assessment Report 080500

MacNaughton, R.B., Fallas, K.M. and Zantvoort, W., 2008. Qualitative assessment of the Plateau Fault (Mackenzie Mountains, NWT) as a conceptual hydrocarbon play; Geological Survey of Canada, Open File 5831, 33 p.

Morrow, D. W., 1991. The Silurian - Devonian sequence in the northern part of the Mackenzie Shelf, Northwest Territories; Geological Survey of Canada, Bulletin 413, 121 p.

Morrow, D. W., 1999. Lower Paleozoic stratigraphy of northern Yukon Territory and northwestern District of Mackenzie; Geological Survey of Canada, Bulletin 538, 202 p.

NORMIN, 2011. The Northern Mineral Showings Database 2008/01/28. Northwest Territories Geoscience Office, Yellowknife, NT, http://ntgomap.nwtgeoscience.ca/.

Roots, C. and Martel, E., 2008. Preliminary geological map of Sekwi Mountain map area (NTS 105P and parts of 106A, 95M, and 96D), Mackenzie Mountains, Northwest Territories; Northwest Territories Geoscience Office, NWT Open File 2008-04. 1 map sheet, various scale maps, and accompanying report 17 p.

MINERAL LOCALITIES (NORMIN, 2011)

Label	Name	Showing	Development Stage	Commodities
1	NITE	105PNE0022	Local Examination	Cu-Ag
2	Day-Noon	105PNE0025	Local Examination	Cu-Ag-Zn-Au
3	ZEE	105PNE0037	Local Examination	Zn-Pb
4	CAL	105PNE0038	Local Examination	Zn-Pb
5	REEF-3	105PNE0039	Local Examination	Zn-Pb
6	BA	105PNE0040	Local Examination	Ba
7	REEF-2	105PNE0041	Local Examination	Zn-Pb
8	REEF-1	105PNE0042	Local Examination	Zn-Pb
9	SCAT-7	105PNE0043	Local Examination	Zn-Pb
10	Coppercap 2	105PNE0044	Reconnaissance	Cu
11	Twitya 2	105PNE0045	Reconnaissance	Pb
12	Sekwi	105PNE0046	Local Examination	Coal
13	WAC	105PNE0047	Local Examination	Coal
14	Bari	105PNE0048	Reconnaissance	Ba
15	HA1110	105PNE0049	Reconnaissance	Pb-Zn
16	KEG	105PNW0001	Drilled	Zn
17	TAP-1	105PNW0002	Drilled	Zn-Pb
18	TAP-2	105PNW0003	Local Examination	Zn-Pb
19	DEE-1	105PNW0004	Local Examination	Zn-Pb
20	TEE EXTENSION	105PNW0005	Local Examination	Pb-Zn
21	TEE-1	105PNW0006	Local Examination	Zn-Pb
22	LIN-1	105PNW0007	Reconnaissance	Pb
23	Snow Zone 2	105PNW0008	Reconnaissance	Zn-Pb
24	Snow Zone 1	105PNW0009	Local Examination	Zn-Pb
25	Rain Zone 1	105PNW0010	Drilled	Zn-Pb
26	Rain Zone 2	105PNW0011	Reconnaissance	Zn-Pb
27	Rain Zone 3	105PNW0012	Drilled	Zn-Pb
28	DICK-1	105PNW0013	Local Examination	Zn-Pb
29	DICK-3	105PNW0014	Local Examination	Zn-Pb
30	LAN-1	105PNW0015	Local Examination	Pb-Zn-Ag
31	KEV	105PNW0016	Local Examination	Zn
32	ALFA	105PNW0017	Reconnaissance	Ba-F-Pb
33	ART-EKWI No.1	105PNW0018	Drilled	Zn-Pb
34	ART-EKWI No.2,3,4	105PNW0019	Drilled	Zn-Pb
35	ICE-9	105PNW0020	Drilled	Pb-Zn
36	ARN-6	105PNW0021	Local Examination	Pb-Zn
37	OS-DA	105PNW0033	Local Examination	Zn-Pb
38	DEE-3	105PNW0034	Local Examination	Zn-Pb-Ag
39	SCAT-5	105PNW0036	Local Examination	Zn-Pb
40	Wise	105PNW0037	Local Examination	Ba-Zn
41	Anita	105PNW0038	Local Examination	Ba
42	ARN-1	105PNW0039	Local Examination	Pb-Zn
43	Emily-3	105PNW0040	Local Examination	Zn-Pb
44	Emily-5	105PNW0041	Local Examination	Zn-Pb
45	ICE-6	105PNW0042	Local Examination	Pb-Zn
46	TAP-3	105PNW0043	Drilled	Zn-Pb
47	TAP-4	105PNW0044	Drilled	Zn-Pb
48	SCAT-3	105PNW0045	Local Examination	Zn-Pb
49	SCAT-10	105PNW0046	Local Examination	Zn-Pb
50	Road River 1	105PNW0047	Reconnaissance	Zn
51	Road River 2	105PNW0048	Reconnaissance	Zn
52	DAR	105PSE0024	Reconnaissance	Zn-Pb-Cu-Ag
53	Majesty	105PSE0025	Drilled	Pb-Zn-Ag-Cu

Canada

Complete coverage of this area at 1:100,000 scale is provided in companion maps issued by Northwest Territories Geoscience Office (NWT Open Files 2010-09 to 2010-19)

GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA

NORTHWEST TERRITORIES GEOSCIENCE OFFICE — RESEARCH • ANALYSIS • INFORMATION

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Geology by C.F. Roots, E. Martel, K.M. Fallas, R.B. MacNaughton, S.P. Gordey, and B. Fischer (2007-2008). Contributions from previous works as indicated on source index

Geological compilation by C.F. Roots, S.P. Gordey and R.B. Cocking, 2009-2011

Co-ordinated through the auspices of the Northern Resource Development Program, Earth Sciences Sector and Northwest Territories Geoscience Office

OPEN FILE 6592

BEDROCK GEOLOGY

SEKWI MOUNTAIN (105P)

NORTHWEST TERRITORIES

Universal Transverse Mercator Projection
North American Datum 1983
© Her Majesty the Queen in Right of Canada 2011

Projection transverse universelle de Mercator
Système de reference géodésique nord-américain, 1983
© Sa Majesté la Reine du chef du Canada 2011

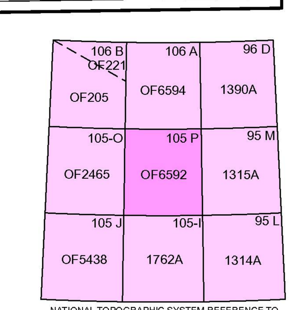
Digital cartography by K.L. Pierce, Northwest Territories Geoscience Office (NTGO) and R.B. Cocking (GSC Vancouver)

Digital base map from data compiled by Geomatics Canada, modified by the Geological Survey of Canada

Some geographical names subject to revision

Mean Magnetic declination 2011, 23° 43' E, increasing 27' annually. Readings vary from 23° 27' E in the southeast corner to 23° 58' E in the northwest corner of the map

Elevations in metres above mean sea level



LEGEND

CENOZOIC

PLEISTOCENE AND RECENT

- **Qs** — *Silt, sand and gravel; organic deposits; i cludes unconsolidated glacial and alluvial deposits, rockfall, landslide-debris.*

WESTERN PART OF MAP

MESOZOIC

CRETACEOUS

- **Kg** — *Quartz monzonite and granodiorite; fine-grained equigranular to medium-grained K-feldspar-phyric texture; clinopyroxene- biotite- and hornblende-bearing; metaluminous to weakly paraluminous.*

PALEOZOIC

CARBONIFEROUS AND PERMIAN
UPPER CARBONIFEROUS TO LOWER PERMIAN

- **CPMC** — *MOUNT CHRISTIE FORMATION: pale green shale, siltstone and chert, minor quartz sandstone.*

CARBONIFEROUS
TSICHU GROUP (CHC, CHT, CKC, CCP and CF)

- **CF** — *FOURWAY FORMATION: calcarenite and calcsiltite, siliceous, white; minor quartzite or chert interbeds.*
- **CKC** — *KEELE CREEK FORMATION: shale, dark grey to black; interstratified with crinoidal limestone; chert beds and nodules near top.*
- **CHT** — *HERITAGE TRAIL FORMATION: quartz sandstone and pebble conglomerate, medium grey to white; interbedded with dark shale.*
- **CHC** — *HAWTHORNE CREEK FORMATION: shale, black; minor sandstone and siltstone; lower part includes calcareous black shale; upper third includes yellow limestone beds.*

DEVONIAN AND MISSIPPIAN
EARN GROUP (DM, DP, DTH, uDI, DMP)
UPPER DEVONIAN AND LOWER MISSISSIPPIAN

- **DMP** — *PREVOST FORMATION: chert-arenite, siltstone and shale, thickly bedded, parallel laminated; weathers brown.*

UPPER DEVONIAN

- **uDI** — *'ITSI FORMATION': sandstone, siltstone and shale; resistant, brown weathering, thick-bedded, parallel and ripple cross-laminated.*
- **DTH** — *THOR HILLS FORMATION: shale, black, rusty and chert granule- to pebble-conglomerate; minor sandstone and siliceous shale.*
- **DP** — *PORTRAIT LAKE FORMATION: shale, siltstone, chert-arenite and chert-pebble conglomerate, cherty argillite and minor banded chert; black and dark grey; weathers reddish brown and distinctive silvery blue.*

MIDDLE DEVONIAN TO (?)MISSISSIPPIAN

- **DM** — *MISFORTUNE FORMATION (?): shale to chert (lower); sandstone, minor chert-pebble conglomerate (upper); barite and calcite nodules.*

DEVONIAN
LOWER TO MIDDLE DEVONIAN

- **DHs** — *HAILSTONE FORMATION: limestone, shaly, black, weathers light tan-grey, platy to flaggy; minor limy mudstone with abundant brachiopods.*
- **DGB** — *GRIZZLY BEAR FORMATION: limestone, dark grey, weathers light grey, thin-bedded, crypto-grained; in part bioclastic; DGBa: local upper member of silty limestone, weathers buff.*

SILURIAN AND DEVONIAN
UPPER SILURIAN AND LOWER DEVONIAN

- **SDs** — *SAPPER FORMATION: limestone, silty, weathers buff and tan; shale, black, calcareous; lenses of massive grey limestone.*

SILURIAN

- **SS** — *STEEL FORMATION: mudstone, wispy laminated; weathers orange and green.*

ORDOVICIAN AND SILURIAN
LOWER ORDOVICIAN TO LOWER SILURIAN

- **OSD** — *DUO LAKE FORMATION: shale, calcareous, black, locally graptolitic, recessive; shaly limestone, weathers buff-tan; OSDa, may include undifferentiated Devonian strata within area of complex facies changes (NTS 105P SE) ; relationship to Sapper Formation mapped to south (NTS 105I) is problematic.*

CAMBRIAN AND ORDOVICIAN
UPPER CAMBRIAN TO LOWER ORDOVICIAN

- **ЄOR** — *RABBITKETTLE FORMATION: limestone, silty and argillaceous, dark grey, weathers light brown to bluish grey, fine- to crypto-grained, thin-bedded, flaggy and wavy-bedded; shale, calcareous, laminated and platy, weathers dark grey to brown grey; dolostone, buff.*

CAMBRIAN
MIDDLE CAMBRIAN

- **ЄHR** — *HESS RIVER FORMATION: shale, black, calcareous; local chert; minor limestone.*

CAMBRIAN TO DEVONIAN

- **ЄDHE** — *HESS RIVER, RABBITKETTLE, DUO LAKE FORMATIONS AND EARN GROUP, undivided: dark grey-brown to black shale, argillite, silty shale and brown siltstone; minor chert-pebble conglomerate, chert arenite and quartzite, weathers silvery grey or tan; black shaly limestone, graptolitic.*

CENTRAL AND EASTERN PARTS OF MAP

MESOZOIC

CRETACEOUS

- **Ksp** — *Shale and sandstone, dark grey to black; quartz pebble and cobble conglomerate; coal seams.*

PALEOZOIC

DEVONIAN
UPPER DEVONIAN

- **DI** — *IMPERIAL FORMATION: rhythmically bedded sandstone, brown, quartzose, and shale, dark brown to black; interstratified shale, siliceous shale and minor limestone.*

MIDDLE AND UPPER DEVONIAN

- **DHICI** — *HARE INDIAN, CANOL AND BASAL IMPERIAL FORMATIONS UNDIFFERENTIATED: shale, partly black, siliceous, bituminous; minor chert-pebble conglomerate, chert arenite, limestone and siltstone.*
- **DC** — *CANOL FORMATION: DC, undivided; DCu, upper member: shale, siliceous, whitish blue weathering; siltstone; rare limestone nodules; DCl, lower member: shale, rusty black, siliceous, silty; rare beds of sandstone and chert-pebble conglomerate; ironstone nodules.*

MIDDLE DEVONIAN

- **mDN** — *NAHANNI FORMATION: limestone, weathers light grey, massive, thick-bedded, fossiliferous, fine- to medium-crystalline.*
- **DHu** — *HUME FORMATION: limestone, fossiliferous; minor shale; weathers dark grey to brown-grey; near Godlin River includes thin Bear Rock Formation (DBR) at base.*
- **DH** — *HEADLESS FORMATION: limestone, argillaceous and silty, weathers buff-brown to dark grey, fossiliferous; minor intercalated dolostone, orange weathering and limestone, light grey weathering, fine- to crypto-crystalline, thin-bedded.*

LOWER AND MIDDLE DEVONIAN

- **DL** — *LANDRY FORMATION: limestone, weathers light grey to buff-brown, crypto-crystalline, fossiliferous, thin- to very thick-bedded and resistant.*
- **DA** — *ARNICA FORMATION: dolostone and limestone, weathers pale grey, banded; minor solution breccia; locally may include equivalents of Delorme Group at base.*
- **DBR** — *BEAR ROCK FORMATION: dolostone; dolostone solution-breccia; anhydrite, gypsum; locally includes thin Tsetso Formation at base; weathers light grey and cavernous.*
- **DS** — *SOMBRE FORMATION: dolostone, alternating light to dark grey banded, medium-bedded, fine-grained, weathers dark grey.*

DELORME GROUP (SDT, IDC)
LOWER DEVONIAN

- **IDC** — *CAMSELL FORMATION: limestone-clast breccia, weathers light grey and buff, massive and porous, interpreted as solution-collapse (Morrow, 1991). Grades laterally into Tsetso Formation.*

SILURIAN AND DEVONIAN

- **SDT** — *TSETSO FORMATION: dolostone, quartz sandstone, light and dark grey to brownish grey fresh colour, weathers buff, yellow and orange, very fine grained, well bedded; minor limestone, light grey to white.*

CAMBRIAN TO SILURIAN
RONNING GROUP (ЄOF, OSK)
UPPER ORDOVICIAN AND LOWER SILURIAN

- **OSK** — *MOUNT KINDLE FORMATION: dolostone, dark grey to dark brownish grey, weathers medium to dark grey, fine- to medium-crystalline, thick-bedded to massive, fossiliferous, vuggy; distinctive grey and white chert nodules throughout; distinctive fauna includes orthocone cephalopods, stromatoporoids, and corals (Halysites, Catenipora).*

MIDDLE ORDOVICIAN

- **mOS** — *SUNBLOOD FORMATION: dolostone and limestone, weathers buff and light grey, flaggy, rare onchoids; common intercalation of mottled limestone, weathers yellow, red, and grey.*

UPPER CAMBRIAN AND LOWER ORDOVICIAN

- **ЄOF** (b) — *FRANKLIN MOUNTAIN FORMATION: dolostone, partly sandy, silty, argillaceous, predominantly pale grey, weathers light grey and buff to orange; ЄOFb, 'basal red beds': sandstone, red shales, conglomerate, dolostone, chert (differentiated on cross-sections only).*
- **ЄOBS** — *BROKEN SKULL FORMATION: dolostone and limestone, weathers grey, buff, and orange; lower part variably sandy and silty.*

MIDDLE CAMBRIAN

- **ЄR** — *ROCKSLIDE FORMATION: limestone, grey, weathers tan to brown, nodular, concretionary, recessive, locally stromatolitic; siltstone, light olive grey, maroon, and dark grey; sandstone.*

LOWER CAMBRIAN

- **lЄS** — *SEKWI FORMATION: dolostone, weathers bright orange and buff; sandstone, dolostone-cemented, nodular and wavy banded, weathers grey to buff; common light grey silty limestone beds, oolitic and bioclastic; minor variegated shale.*
- **lЄV** — *VAMPIRE FORMATION: sandstone and siltstone, weathers dark brown, thin-bedded, locally argillaceous; minor interbedded orthoquartzite, white to light grey, medium- to coarse-grained.* *lЄVa: siltstone and shale, dark grey-brown and green, well banded and laminated, platy to thin-bedded; minor argillaceous sandstone. Platy carbonate member weathers medium blue-grey or buff.*
- **lЄB** (u, m, l, lm) — *BACKBONE RANGES FORMATION: lЄB, undivided; lЄBu, upper member: quartz sandstone, light grey, white and pink, weathers dark due to black lichen cover, thick-bedded, medium- to coarse-grained; minor platy siltstone and silty shale; lЄBlm, middle and lower members (differentiated on cross-section only); middle member: dolostone, well-bedded, weathers mottled mauve to pink, silty to sandy; minor quartz sandstone and red to purple shale; lower member: quartz sandstone and siltstone, thin- to thick-bedded, weathers yellowish grey.*

NEOPROTEROZOIC

EDIACARAN AND CAMBRIAN

- **uPЄI** — *INGTA FORMATION: shale, green and purple-red; minor sandstone and quartzite; limy sub-unit at top.*

EDIACARAN

- **uPR** — *RISKY FORMATION: dolostone, grey to pale grey, weathers light grey, cream to buff, thick-bedded; in part oolitic and sandy; minor dolostone-cemented sandstone.*

WINDERMERE SUPERGROUP

- **uPB** — *BLUEFLOWER FORMATION: Lower member: lime mudstone, ribbon-bedded; interbedded with thin sandstone. Upper member: shale, dark and sandstone, coarse; includes carbonate-clast debris flows.*
- **uPG** — *GAMETRAIL FORMATION: dolostone, grey, weathers grey to light grey, particulate, well bedded, thin- to very thick bedded; locally normal-graded, sandy, cross-bedded, or stromatolitic; carbonate breccia to megabreccia. Some outcrops extensively veined by white dolomite, producing a 'zebra-rock' texture.*
- **uPS** — *SHEEPBED FORMATION: shale, dark grey, weathers dark brown and brown-grey; siltstone, dark to medium gray, weathers brown, laminated; coarsens upward; minor thin beds of sandstone and pebble conglomerate.*

HAY CREEK GROUP (PTw, PKe, uPIB, and uPT)

- **uPT** — *'TEPEE DOLOSTONE': dolostone, weathers yellow to pinkish orange, micro- and crypto-crystalline, millimetre-scale flat lamination; locally interrupted by radiating fans of calcite pseudomorphs after aragonite; local warping of lamination to form micro-anticlinal 'tepee' structures.*

CRYOGENIAN

- **PIB** — *ICE BROOK FORMATION: diamictite (tillite), clasts are granule to boulder, weathers orange to green, clasts are rounded to angular, clast composition is mainly grey oolitic limestone and less abundant pink friable sandstone; interbedded mudstone and siltstone contains rare dropstones; minor sandstone beds.*
- **PKe** — *KEELE FORMATION: dolostone, limestone, quartz sandstone, shale, conglomerate, weathers light grey to buff or orange; varies compositionally from carbonate-rich to sandstone-rich. Contains a siliciclastic upper member.*
- **PTw** — *TWITYA FORMATION: shale, grey-green to dark grey, weathers dark green to brownish grey, locally pyritic; siltstone, light grey; sandstone, light green-grey to brown, parallel lamination; limestone as laminae and beds, weathers buff-orange to brown; minor polymictic conglomerate; basal, dark-weathering particulate limestone; contains carbonate olistoliths.*

RAPITAN GROUP (PSa, PSh)

- **PSh** — *SHEZAL FORMATION: diamictite (tillite), light green-grey to dark grey, weathers brown to orange-brown; stratified with mudstone, silty to sandy; unit contains pebbles, cobbles and boulders of carbonate, altered basic volcanic rock, sandstone, chert, and mudstone, as well as rare metamorphic clasts.*
- **PSa** — *SAYUNEI FORMATION: siltstone, weathers dark purple to brown, thinly laminated; sandstone; argillite, maroon to grey-green; contains conglomerate lenses and diamictite; near the top is hematite-jaspilite iron formation with dropstones. May locally include Mount Berg Formation at base: matrix to clast supported, polymictic conglomerate and breccia.*

COATES LAKE GROUP (PTH, PRR, PCc)

- **PCc** — *COPPERCAP FORMATION: limestone, light grey to buff, clastic, laminated to massive, graded bedding; dolostone, weathers orange to dark grey; interbeds of fetid shaly limestone, calcareous shale, and sandstone; in the upper portion, the dolostone contains layers of breccia, anhydrite, marl, and conglomerate.*
- **PRR** — *REDSTONE RIVER FORMATION: siltstone, reddish maroon, weathers reddish-pink, recessive; red mudstone, shale, gypsum, gypsiferous siltstone and conglomerate; at top is a tan weathering succession of interbedded mudstone, evaporites, and carbonates (the Transition Zone) which hosts copper showings.*
- **PTh** — *THUNDERCLOUD FORMATION: interbedded mudstone and siltstone; weathers red and pink; minor dolostone, weathers orange or tan.*
- **Pg** — *Gabbro, greenish black, medium-grained; occurs as dykes cutting the Katherine and Little Dal groups and as prominent sills within the Tsezotene Formation (cross-section only).*

MACKENZIE MOUNTAINS SUPERGROUP
LITTLE DAL GROUP (PLDb; PLDgs, PLDg, PLDr, PLDu informal units recognized recognized by Aitken (1981))

TONIAN

- **PLDu** — *'UPPER CARBONATE FORMATION': dolostone, orange-brown and grey, thick-bedded, local domal stromatolites, locally siliceous, very resistant.*
- **PLDr** — *'RUSTY SHALE FORMATION': siltstone and shale, red-brown, locally grey and green, pyritic and hematitic; sandstone at base.*
- **PLDg** — *'GYPSUM FORMATION': gypsum and anhydrite, white; interbedded with shale, red; thin limestone marker bed in upper part.*

UNITS BELOW NOT ON MAP AND INCLUDED FOR REFERENCE TO CROSS-SECTIONS (UNCOLOURED BELOW LIMIT OF CONFIDENCE)

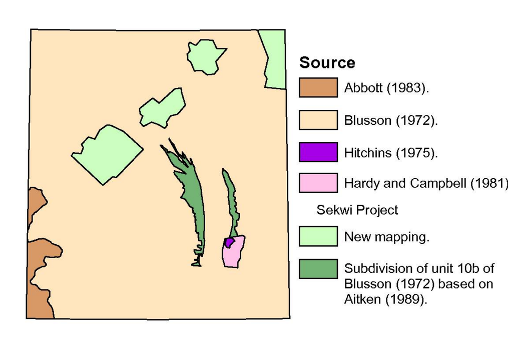
- **PLDgs** — *'GRAINSTONE FORMATION': dolostone, light grey, thick-bedded, oolitic and peloidal; local columnar stromatolites.*
- **PLDb** — *'BASINAL ASSEMBLAGE' AND 'MUDCRACKED FORMATION' UNDIVIDED: thin lower part (Mudcracked formation) - mudstone, dark grey, brown or red; oolites and intraclasts in upper beds; rare interbeds of sandstone, fine-grained; mudcracks and evaporate casts on bedding surfaces; upper part (Basinal assemblage) - limestone and argillaceous limestone, commonly nodular, locally red, with interbedded black shale; calcareous siltite-siltstone-shale rhythmite; local dolomitization; algal stromatolites occur as metre-scale isolated bioherms, tens-of-metres-thick composite bioherms and as giant stromatolitic reefs to 300 m high.*

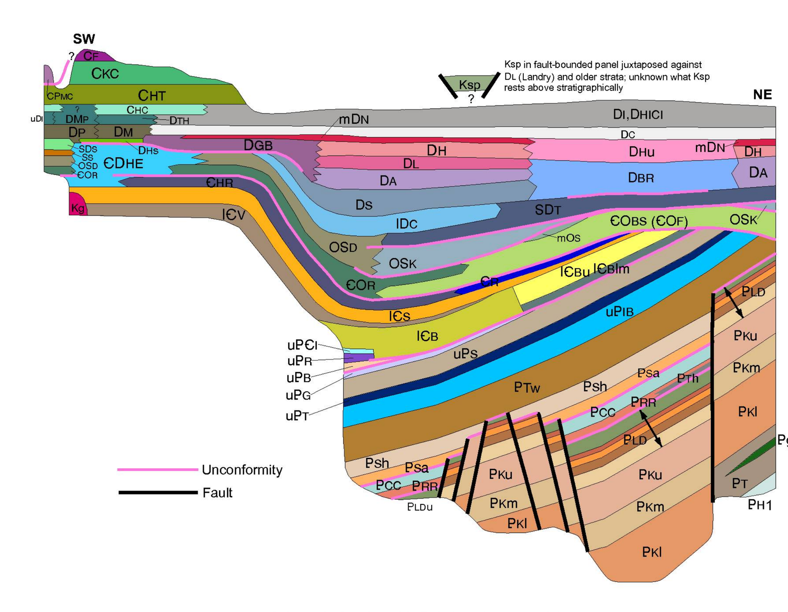
KATHERINE GROUP (PKl, PKm, PKu)

- **PK** — *Katherine Group, undivided.*
- **PKu** — *Upper division: quartz sandstone, light reddish white, cross-bedded, mudcracked shale and siltsone. Corresponds to informal unit K7 of Aitken et al. (1978).*
- **PKm** — *Middle division: dolostone, buff-brown, platy and nodular; dolostone, light grey, thin-bedded with horizons of shale, black, and small stromatolites; locally shale and argillite, pale green, tan, brown, dark grey and purple. Corresponds to informal unit K6 of Aitken et al. (1978).*
- **PKl** — *Lower division: quartz sandstone, weathers pink, purple, and white, thin-bedded and flaggy; minor dolostone, light grey to white, weathers orange, fine-grained, laminated and massive. Corresponds to informal units K1 through K5 of Aitken et al. (1978).*
- **PT** — *TSEZOTENE FORMATION: shale, sandstone, dolostone, local limestone.*
- **PH1** — *Dolostone, minor chert.*

Symbols

Geological contact (defined, approximate, assumed, concealed)
Fault (defined, approximate, assumed, concealed)
Normal fault (defined, approximate, assumed, concealed)
Thrust Fault (defined, approximate, assumed, concealed)
Anticline (defined, overturned)
Syncline (defined, overturned)
Surficial contact
Bedding (tops unknown, tops upright, overturned)
Bedding subhorizontal (tops unknown, tops known)
Foliation
Fold axis
Barite
Coal
Copper
Lead
Zinc
Cross-section line — A1 — A2





Schematic Stratigraphic Relations (not to scale)
Based on current work, Cecile (1982), Morrow (1991), and Aitken (1991).

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