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GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

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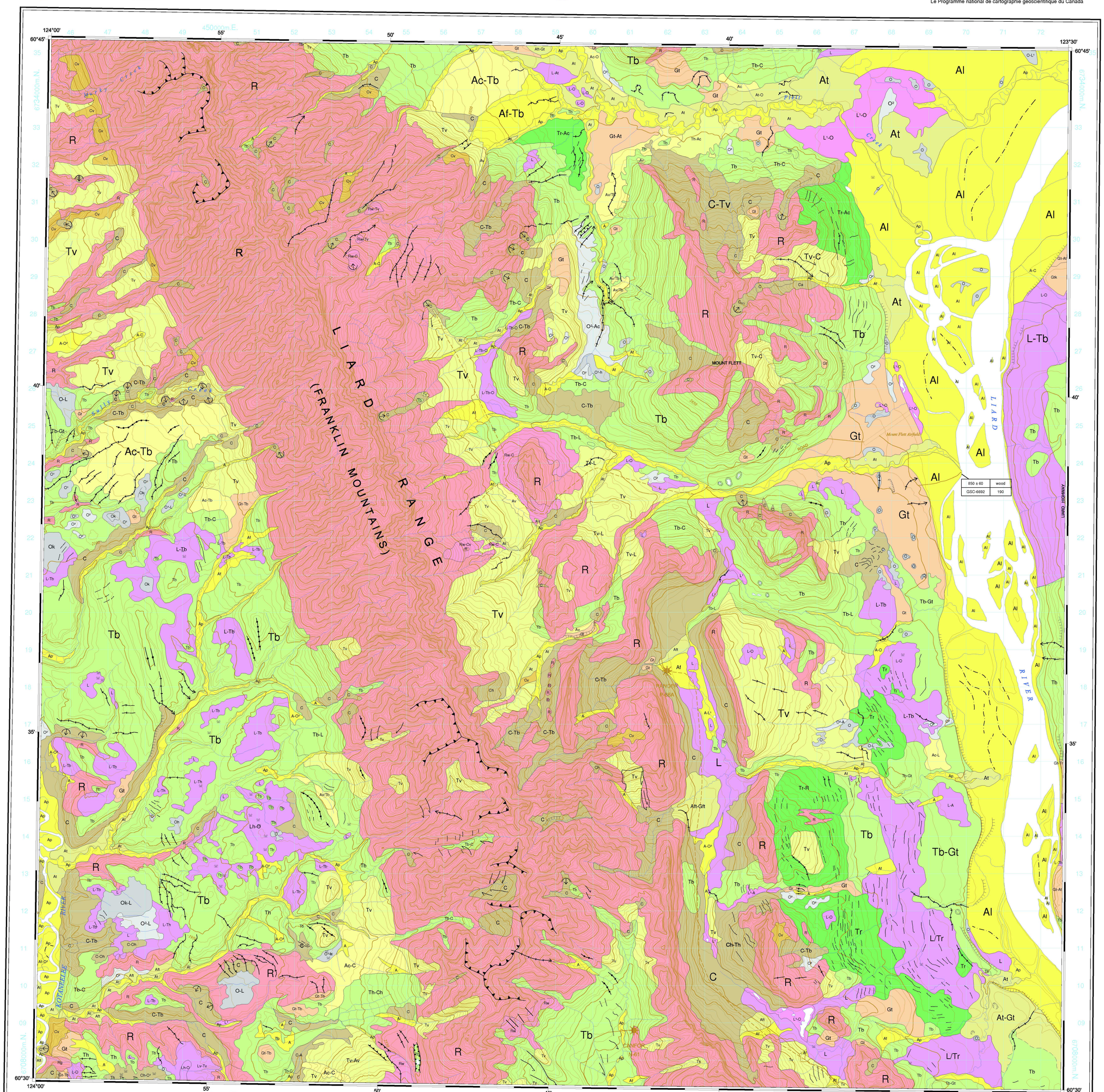
Canada's National Geoscience Mapping Program
Le Programme national de cartographie géoscientifique du Canada



INDEX MAP

CONTOUR INTERVAL 50 FEET
Elevations in Feet above Mean Sea Level

Digital Topographic Data provided by Geomatics Canada, Natural Resources Canada adjusted to conform to Landsat Geocover Image (Landsat-5 Image mosaic, August 1991), including an updated course of the Liard River, by the author

OPEN FILE 4481

SURFICIAL GEOLOGY

MOUNT FLETT

NORTHWEST TERRITORIES

Scale 1:50 000 Échelle

kilometres 1 0 1 2 3 4 5 kilométres

Universal Tranverse Mercator Projection
North American Datum 1983

Projection transverse universelle de Mercator
Système de référence géodésique nord-américain, 1983

Geology by J. Bednarski, 2000, 2001, 2002
Geological compilation and digital cartography by J. Bednarski, 2002

This is a product of the Central Foreland NATMAP Project

Any revisions or additional geological information from the user would be welcomed by the Geological Survey of Canada

95C/16 Etanda Lakes GSC OF 1671	95 B/13 Sawmill Mountain GSC OF 4476	95 B/14 Netla River GSC OF 4478
95 B/9 Chinkeh Creek GSC OF 1615	95 B/12 Mount Flett GSC OF 4481	95 B/11 Denedothada Creek GSC OF 4480
95 C/8 Babiche Mountain GSC OF 1558	95 B/5 Fisherman Lake GSC OF 4360	95 B/6 Rabbit Creek GSC OF XXXX

NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO ADJOINING GEOLOGICAL SURVEY OF CANADA MAPS

LEGEND

Coloured legend blocks indicate map units that appear on this map

QUATERNARY

SURFICIAL DEPOSITS

POST LAST GLACIATION

NONGLACIAL ENVIRONMENTS

ORGANIC DEPOSITS: *peat; 1 to 2 m thick; formed by the accumulation of vegetation in poorly drained depressions (swamps and bogs); produces flat, wet terrain*

O¹ — ***Bog peat:*** *Sphagnum or forest peat formed in an ombrotrophic environment; may be treed or treeless with a cover of ericaceous shrubs; hummocky, wet terrain, in places underlain by ground ice,* **O'h**; *undifferentiated bog and fen deposits,* **O**; *undifferentiated hummocky bog and fen deposits,* **Oh**; *kettled topography,* **Ok**

O² — ***Fen peat:*** *peat derived from sedges and partially decayed shrubs in a eutrophic environment; forms relatively open peatlands with a mineral rich water table that persists seasonally near the surface; often covered with low shrubs and sometimes a sparse tree cover*

COLLUVIAL DEPOSITS: *mass wasting debris <1-100 m thick; nonsorted to poorly sorted, massive to stratified debris deposited by direct, gravity-induced movement*

C — ***Landslide and slump debris*** *: active and inactive landslides; hummocky terrain,* **Ch**; *inactive* ***rock glaciers***; *rock debris deformed by the flow of buried or interstitial ice, forming ridges and furrows,* **Cʀɢ**

Cv — ***Colluvial veneer:*** *thin cover of rock debris <1 m; usually the product of solifluction acting on lower slopes*

ALLUVIAL DEPOSITS: *sorted gravel, sand, and organic detritus deposited by flowing water*

A — ***Fluvial deposits:*** *sorted gravel and sand >1 m thick; forming active flood plains with meander channels and scroll marks,* **Ap**; *alluvial fan deposits, poorly sorted gravel and sand >1 m thick,* **Af**; *large, low terraces with meander scars and active and inactive channels, primarily along the Liard River,* **Al**; *undifferentiated,* **A**

Ac — ***Fluvial deposits, channelled:*** *numerous subparallel alluvial channels covering gentle to moderate slopes;* ***Alluvial veneer:*** *deposits too thin to mask the underlying surface, <1 m thick,* **Av**

At — ***Fluvial deposits, terraced:*** *low, inactive terraces immediately above active floodplains*

L¹ — ***LACUSTRINE DEPOSITS:*** *sand, silt and minor clay deposited in a former lake; generally overlain by organic deposits; exposed by recent fluctuations in lake levels*

POSTGLACIAL OR LATE WISCONSINAN

PROGLACIAL AND GLACIAL ENVIRONMENTS

L — ***GLACIOLACUSTRINE DEPOSITS:*** *fine sand, silt, and clay, deposited in glacier-dammed lakes in valleys or along margins of the retreating Laurentide Ice Sheet; > 1 m thick; level topography; usually overlain by organic deposits in lowlands; hummocky topography,* **Lh**; *kettled topography,* **Lk**

G — ***GLACIOFLUVIAL DEPOSITS*** *: proglacial outwash, gravel and sand with minor diamictons deposited in front of the ice margin, usually 1-10 m thick; forming distal outwash terraces,* **Gt**; *delta terraces,* **Gtd**; *ice-contact ridges,* **Gr**; *undifferentiated,* **G**

TILL: *nonsorted debris deposited directly by glaciers; matrix is sandy to clayey and contains striated clasts of various lithologies, including many Canadian Shield erratics in the lowlands*

Tb — ***Till blanket:*** *> 1 m thick; forming undulating topography; hummocky moraine,* **Th**; *rolling topography,* **Tm**

Tr — ***Ridged moraine:*** *moraines or crevasse fillings forming a ridged topography*

Tv — ***Till veneer:*** *< 1 m thick and discontinuous; underlying bedrock topography is discernible*

PRE-QUATERNARY
BEDROCK

R — *SEDIMENTARY BEDROCK; Paleozoic to Mesozoic rocks exposed along steep mountain ridges of the Liard Range*

Rw — *Rubble covered bedrock surfaces*

NOTE: *In areas where the surficial cover forms a complex pattern, the area is coloured according to the dominant unit and labelled in descending order of cover; slash between two units indicates that the former unit overlies the latter*

Geological boundary (defined, gradational)
River meander scar
Small swamp or bog
Landslide (arrow indicates the direction of movement)
Abandoned meltwater channel or channel occupied by an underfit stream (large, small and direction of flow inferred, small and direction of flow not inferred)
Lateral meltwater channel, barb on the uphill side
Escarpment
Kettle
End moraine
Minor moraine or crevasse filling
Ice moulded form in till (direction of flow inferred, not inferred; broader forms have middle dots)
Furrows and troughs related to glacial flow, likely formed subglacially
Cirque; cirques; peaks and sharp ridges formed by glacial erosion
Radiocarbon date (uncorrected)

Date	Material
Lab. no.	Elev. (m)

NOTES:

Mount Flett map area was glaciated during the Late Wisconsinan glaciation (ca. 25 000-10 000 years ago). South of here, in the Fisherman Lake area, wood fragments between reworked till and glaciolacustrine sediment radiocarbon dated 32.7 ka BP (I-3187, Millar 1968), provide a maximum age for the advance. Although the area was probably first glaciated by montane ice from the west, the last major ice sheet to cover the area was the continental Laurentide Ice Sheet. The Laurentide Ice Sheet flowed into the region from the northeast, carrying with it distinctive erratics from the Canadian Shield, which are now found in till mantling the valley floors and on several mountain summits in the area.

During deglaciation, the Liard River drainage into the Mackenzie River was blocked by the Laurentide Ice Sheet and glacial lakes were created in the valleys north and south of Mount Flett. It is likely that arms of glacial Lake Liard, a large lake that filled the Laird River valley, entered these mountain valleys during early postglacial time. The Kotaneelee River valley, in the western part of the map area, was also flooded. With further retreat of the ice sheet, glacial Lake Liard regressed from these valleys and the mountain creeks deposited sandy sediment into them. Auger data from seismic surveys in this area show that the Liard floodplain is typically underlain by 23 metres of sand and gravel and clay. A line running east from the Mount Flett Airfield showed 16 metres of gravel overlying 7 metres of clay. Closer to the Liard River, the basal layer is described as 8 metres of hard sand. On the east side of the Liard River, the ridge is sandstone and shale overlain by six metres of clay and sand, and the crest of the ridge is overlain by only 2 metres of till.

Riverbank exposures along the Liard River typically show about 4 metres of rhythmically bedded silt and fine sand. In places, the sediments contain buried woody layers including tree stumps. The wood debris is usually charred, which is common along the banks of the Liard River for tens of kilometres. This suggests that major sedimentation occurs during flood events that follow major forest fires. Radiocarbon dates from charred wood throughout the area record a number of major forest fires during the Holocene. A charred spruce log in the Mount Flett map area dated 850 ±60 ^{14}C BP (GSC-6692).

Landslides are common in the area. Interbedded recessive shales and thick sandstones exposed along cliffs in the Liard Range are prone to failures causing landslides ranging in size from a few 10's m² to several km². Active and relic landslides suggest that mass wasting has been occurring throughout the postglacial time and is on going.

REFERENCES

Millar, J.F.V.
1968: Archeology of Fisherman Lake, western District of Mackenzie, N.W.T.; unpublished Ph.D. dissertation, University of Calgary, 496 p. p. 57.

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