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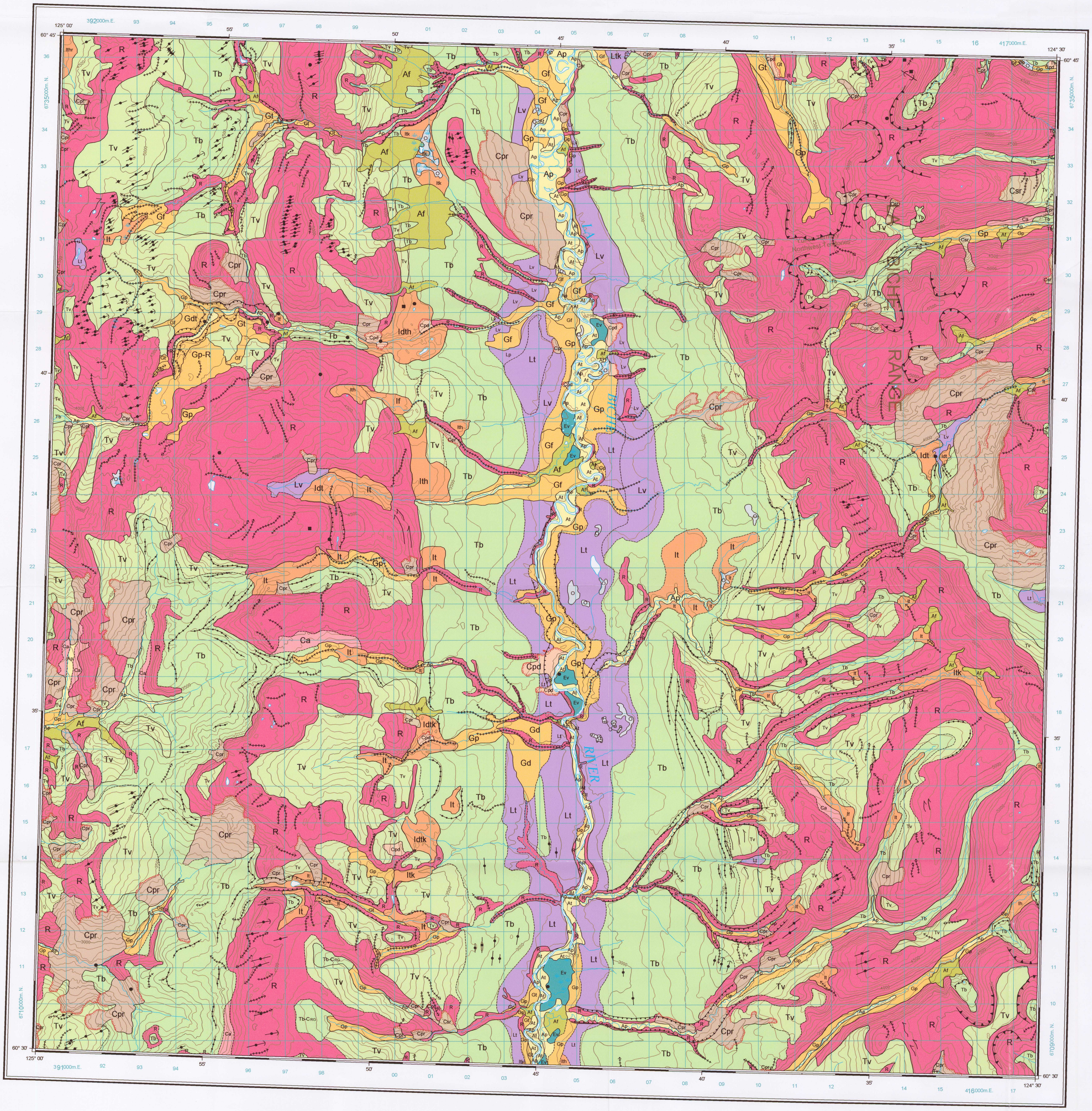
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

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



UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 10

LEGEND

Coloured legend blocks indicate units that appear on this map

QUATERNARY

SURFICIAL DEPOSITS

POST LAST GLACIATION

NONGLACIAL ENVIRONMENTS

O — ***ORGANIC DEPOSITS:*** *organic matter; >1 m thick; formed by the accumulation of vegetation in poorly drained depressions (swamps and bogs); usually forms flat terrain*

COLLUVIAL DEPOSITS: *block accumulations and mass wasting debris, 1-50 m thick*

Ca — *Talus (scree): accumulations of blocks; commonly exceeding 2 m in diameter; as much as 50 m thick; forming aprons and fans below cliffs*

CRG — *Rock Glaciers: rock debris deformed by the down-slope flow of buried or interstitial ice, forming pronounced transverse and longitudinal ridges and furrows; largely relict forms, though some active rock glaciers are present*

Cpd — *Debris slump deposits: unconsolidated material; generally smaller blocks or more localized masses, but may include larger masses (>10 m thick) where associated with thick till, glaciolacustrine or glaciofluvial deposits; internal structure of material may be retained; commonly traceable upslope to active scarps; where sufficient moisture is present the slump can become a debris flow, producing characteristic levees along its lateral margins and a spatulate form at the base of slope*

Cpr — *Bedrock slump deposits: large rotational blocks in bedrock, shallow to 10's of metres thick; internal structure of material may be retained; commonly traceable upslope to active scarps; where sufficient moisture is present the slump may produce a flow at its base, forming a characteristic spatulate form; prominent in areas underlain by shale, siltstone and sandstone beds of Cretaceous Fort St. John Group; associated with the largest mass movements in the region*

Csr — *Rock slide deposits: chaotic landscape of irregular and stacked bedrock blocks; associated with moderately dipping, poorly-indurated sandstone and shale-rich beds in the Mattson Formation*

ALLUVIAL DEPOSITS: *gravel, sand, and organic detritus; >1 m thick*

A — *Fluvial deposits: well sorted gravel and sand with detrital organic beds, including concentrations of logs;* **Ap**, *floodplains mantling valley floors, forming meander scars and point bars;* **At**, *terraces along valley wall sides*

Af — *Alluvial fan: poorly sorted gravel and sand with organic detritus and buried soils; fans are commonly crossed by debris flow channels and levees and subject to shifting stream courses*

Ev — ***EOLIAN DEPOSITS:*** *a veneer of wind deposited sand and silt, forming small dune ridges, locally associated with reworking of extensive glaciolacustrine sediment; <1 m thick*

POSTGLACIAL OR LATE WISCONSINAN

PROGLACIAL AND GLACIAL ENVIRONMENTS

L — ***GLACIOLACUSTRINE DEPOSITS:*** *coarse to fine sand, silt and clay, with gravel debris flow layers and dropstones; deposited in glacier-dammed lakes; level topography;* **Lv**, *thin discontinous veneers, <1 m thick;* **Lt**, *forming terraces, commonly deeply dissected by postglacial erosion where thick;* **Lk**, *kettled*

GLACIOFLUVIAL DEPOSITS: *gravel, sand, minor sandy diamict, usually >1 m thick; deposited on, beneath, or in front of glacier margins*

G — *Proglacial outwash:* **Gd**, *braided outwash deltas;* **Gdt**, *delta terraces;* **Gf**, *fans;* **Gp**, *outwash plains mantling valley floors;* **Gt**, *level outwash terraces;* **Gk**, *kettle holes*

I — *Ice contact stratified drift: deposited behind or at the ice magin; topography is undulating, irregular, or ridged;* **It**, *lateral kame terraces;* **Idt**, *delta terraces;* **Ik**, *kettle holes;* **Ih**, *hummocky moulin kame fields, or ice block disintegration terrain;* **Ir**, *eskers*

TILL: *nonsorted diamict deposited directly by glacial ice; matrix is sandy to clayey and contains striated clasts of various lithologies*

Tb — *Till blanket: > 1 m thick; forming undulating topography that obscures underlying bedrock structure*

Tv — *Till veneer: < 1 m thick and discontinuous; surface mimics underlying bedrock structure*

PRE-QUATERNARY

BEDROCK

R — *Sedimentary bedrock, undifferentiated.*

NOTE: *In areas where the surficial cover forms a complex mosaic, the area is coloured according to the predominant unit and labelled with hyphenated letters in descending order of cover*

MAP SYMBOLS

Geological boundary (defined, gradational)

Slump scarp

Cirque; peaks and sharp ridges formed by glacial erosion

Moraine

Striae (glacial flow direction known, unknown)

Fluting or drumlinoid ridge parallel to ice flow (direction of flow known, unknown)

Proglacial meltwater channel; abandoned or occupied by small underfit stream (wide, narrow with direction of flow inferred)

Lateral meltwater channel (barb points upslope and downflow)

Kettle hole

Ground observation

Drift geochemistry sample site

NOTE:

Mass Wasting: *is the collective term for a range of processes and resultant landforms that relate to the gravitational downslope movement of rock and/or unconsolidated material without direct conveyance by water, air or ice. Water and ice are, however, often key components in initiating and perpetuating mass wasting by reducing the strength of materials and in their plastic and fluid behaviour.*

Different types of mass wasting are distinguished by the type of materials involved (e.g., bedrock, talus, till), the mode of deformation (e.g., creep, slide, slump, flow), speed of movement, morphology of the moving mass, and water content.

Creep is the slow (mm's to cm's per year), often imperceptible, downslope movement of soil, talus or other unconsolidated material. Creep occurs episodically in response to solution weathering, seasonal wetting and drying, or freeze-thaw cycles and may include the plastic deformation of clay-rich soils. While more prevalent on steep slopes, creep can occur on slopes <5°. Evidence of creep is seen where tree trunks or structures (e.g., hydro poles) are tilted downslope, soil accumulates upslope of retaining walls, and cracks develop in the soil perpendicular to the dip of the slope. Creep is also responsible for the formation of gelifluction lobes, prominent, small-scale (metres in length, centimetres thick), periglacial landforms found along the upper reaches of local mountain ranges (but not included in the regional surficial geology mapping).

Slides are rapid, downslope movements of bedrock or unconsolidated material. Failure occurs along bedding and/or fracture planes in bedrock, and along bedrock contacts, or structural and sedimentological boundaries within unconsolidated material. Slides can be initiated at shallow or considerable depths.

Slumps involve the rotational movement of bedrock and/or unconsolidated material along failure planes. Slumps may occur as individual blocks or amorphous masses (reflecting water content and structural integrity of the failing material). Slumps commonly extend progressively up-slope through time, and can be associated with active scarp or headwall retreat. Slumps can be initiated by failure along bedding, fracture, or sedimentological planes, by infiltration of surface water, through lateral incision and undercutting of slopes by streams or excavation activities (e.g., road building, pipeline trenching). Slumps are not as widespread in this map area as in surrounding regions, perhaps reflecting the generally shallower dip of beds. Slumps are most prominent in the shale and other strata of the Besa River Formation. The relatively rare occurrence of slumping in the Fort St. John Group shales adjacent the La Biche River likely reflects their low dip and lack of bedrock incision by streams. Slumps are associated with the largest mass movements in the map area.

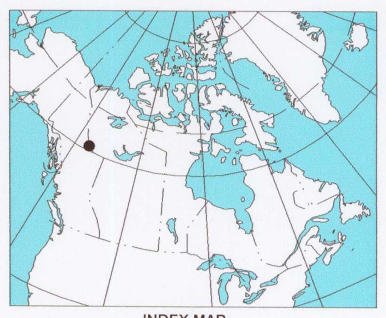
While different earth surface materials and geological settings are often strongly associated with various types of mass wasting, predicting their occurrence, magnitude and rate of deformation is often not possible. Some areas that are prone to mass wasting include regions of steeply dipping bedrock, poorly indurated and shale-rich bedrock, and along stream courses and meandering river channels. Human activities such as road building, pipeline trenching, logging and seismic exploration can also initiate mass wasting, particularly where they undercut slopes, or act to destabilize surficial materials.

Bedrock Geology: *The map area is bookended by the La Biche Range to the east and an unnamed range to the west, with a synclinal basin running north-south through the center of the map. The two ranges are largely comprised of Devonian and Carboniferous Besa River Formation shale and Lower Carboniferous Mattson Formation sandstone and siltstone. Beds are shallow to moderate dipping (6-50°); steeper beds are situated along a series of thrust faults. Permian Fantasque and Tika map unit chert and shale outcrop along the basin-ward margins of the ranges. Shallow-dipping (<20°) shales of Lower Cretaceous Fort St. John Group outcrop in the synclinal basin. [see Khudoley, 2003]*

Glacial History: *The Tika Creek map area was glaciated during the last glaciation (late Wisconsinan; ca. 25-10 000 years ago) by the continental Laurentide Ice Sheet flowing from the northeast (Keewatin Sector) and by the Cordilleran Ice Sheet flowing from the west. The Laurentide Ice Sheet dispersed distinctive granite erratics, originating from the Canadian Shield. Although no granites were found in this map area, granites were found atop the La Biche Range immediately south of this map area at an elevation of 1620 m above sea level (asl). A minimum upper elevational limit of late Wisconsinan glaciation in the region is derived from a 10-Be cosmogenic exposure age of 25.6 ±3.2 ka cal BP on a sandstone erratic at the crest of the Kotaneelee Range (1850 m asl), due east of the map area.*

Striae were rarely preserved on exposed bedrock. Glacial flow directions are indicated by flutes and drumlinoid ridges which record a series of flows: first, southwest Laurentide ice, second, northeast Cordilleran ice (the coalescent margin with Laurentide ice lay east of here), third, topographically-confined, northward flowing Cordilleran ice occupying the La Biche River valley. A series of prominent ice-contact deltas and terraces along the western margin of the La Biche River valley record this final occupation of the valley by Cordilleran ice. During this deglacial phase the southward drainage of the La Biche River was impounded, and instead diverted northwards across the modern drainage divide into glacial Lake Nahanni. As ice continued to retreat southwards, outlets opened to the west and east, which are accordant with a series of proglacial lake levels, and associated glaciolacustrine sediment fills.

In the northeast and southeast part of the La Biche Range, cirque basins and associated small arcuate moraines within the cirques and immediately down-valley indicate a period of alpine/cirque glaciation. The fact that the moraines are well vegetated, have a subdued morphology, and that no cirque glaciers were found anywhere in the 95C map area, suggests that these moraines were not formed during the Little Ice Age (1400 - 1900 AD). Instead, it is thought that they formed coincident with the retreat of the Cordilleran and Laurentide ice sheets, and possibly reactivated during a mid-Holocene neoglacial period recognized in areas west of here [see Dyke, 1990].



INDEX MAP

CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level

OPEN FILE 4702

SURFICIAL GEOLOGY
TIKA CREEK
YUKON TERRITORY - NORTHWEST TERRITORIES

Scale 1:50 000/Échelle 1/50 000

Kilometres 1 0 1 2 3 Kilomètres

Universal Transverse Mercator Projection
North American Datum 1983

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

Compilation by I.R. Smith based on fieldwork and studies of vertical air photographs 2000-2002.
THIS MAP IS A PRODUCT OF THE CENTRAL FORELAND NATMAP PROJECT

Surficial geology from field work by I.R. Smith 2000-2002.

Digital cartography by I.R. Smith.

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

Base map at the same scale published by Surveys and Mapping Branch in 1971.

95C/14 no title	95C/15 Dendale Lake	95C/16 Etanda Lakes GSC OF 1671
95C/11 Whitefish River	95C/10 Tika Creek GSC OF 4702	95C/9 Chinkeh Creek GSC OF 1615
95C/6 Gold Pay Creek	95C/7 Chinkeh Creek GSC OF 1771	95C/8 Mount Flett GSC OF 1558

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

This map has been reprinted from a scanned version of the original map

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REFERENCES

Dyke, A.S.
1990: A lichenometric study of Holocene rock glaciers and neoglacial moraines, Frances Lake map area, southeastern Yukon Territory and Northwest Territories. Geological Survey of Canada Bulletin 394.

Khudoley, A.K.
2003: Geology, Tika Creek (95C/10), Yukon Territory and Northwest Territories; Geological Survey of Canada, Open File 1660, 1 map, scale 1:50 000.

OPEN FILE
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