Energy, Mines and Resources Canada | Énergie, Mines et Ressources Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

STRATIGRAPHIC SECTIONS

1
- Diamicton: stratified on the 1.5-0.5 m scale by colour changes and sand and silt layers, lower contact obscured
- Sand: intermittently exposed through vegetation

covered 13 m to river

2
- Gravel: cobbles to pebbles
- Sand, silt, and clay: abundant soft sediment deformation features
- Covered interval is a small failure

covered 16 m to river

3
- Gravel: cobbles to pebbles, well stratified
- Sand and minor gravel: poorly exposed, predominantly medium and coarse sand, gravel at base

river

4
- Gravel: pebbles to cobbles, abruptly normally graded
- Diamicton: stratified with sand and silt layers
- Gravel: poorly sorted, abundant boulders of local bedrock at base

river

5
- Covered and vegetated
- Gravel and sand: gravel in lower 1 m
- Diamicton: massive to stratified, stratification occurs mainly at base, becomes more massive upward; stratification marked by thin gravel and sand layers and lenses, and by slight colour changes

covered 9 m to river

6
- Gravel and sand: gravel in lower 4 m, sand above
- Sand, silt and minor clay: appears to coarsen upward, well stratified, abundant dropstones

covered 8 m to river

7
- Gravel: well stratified, pebbles
- Sand, silt, and clay: lower 15 m is predominantly clay and silt, highly disturbed, upper 4 m is well bedded silt and sand

river

8
- Diamicton: clasts striated
- Sand and gravel: coarsening upward sequence from fine and medium sand to cobble gravel
- Diamicton, gravel, and sand: complex mixture with abundant convoluted bedding and loading structures; unit fines upward
- Diamicton: striated clasts, generally massive with some stratification with gravel and sand lenses
- Sand and gravel: highly disturbed in some areas

covered 29 m to river

9
- Gravel: pebbles to cobbles
- Silt and clay: exposure poor, unit actively failing; segregated ice lenses present; dropstones throughout

10
- Gravel: incised in a large channel, very coarse at base, clasts up to 1 m; finer and well stratified upward
- Sand and silt: well stratified and normally graded, some large scale soft sediment deformation features

covered 4 m to river

11
- Diamicton: sandy matrix, well stratified with abundant sand layers; abundant folding present, some large scale
- Gravel and sand: gravel very coarse at base, finer upward and interstratified with sand
- Diamicton: clasts striated, massive

river

12
- Silt and clay: lower contact gradational, well stratified, abundant striated clasts in upper 4 m
- Silt and sand: highly disrupted, little well defined stratification, abundant soft sediment deformation and fluid escape structures, dropstones present
- Gravel and diamicton: gravel poorly sorted, most matrix supported

covered 3 m to river

13
- Covered
- Sand, silt and clay: sand and silt predominant at base, some dropstones, highly disturbed, clay and silt predominant at top

covered 23 m to river

14
- Sand, silt, and clay: fines upward, slight coarsening trend in upper 2 m
- Diamicton: stratified with sand layers, deformed in broad fold

covered 2 m to river

15
- Silt and clay with minor sand: fines upward to predominantly silty clay in upper 10 m, flow structures and soft sediment deformation features throughout, highly disturbed in lower 5-6 m

covered 11 m to river

16
- Sand and gravel: lower contact gradational
- Sand and silt: well stratified, no dropstones observed, some soft sediment deformation structures

covered 4 m to river

17
- Sand, silt and clay: fines upward to predominantly clay, scattered dropstones throughout
- Diamicton: clasts striated, massive

7 m to river

18
- Sand and gravel: most of section predominantly sand, well stratified, abundant soft sediment deformation features; upper 5-6 m is interstratified sand and gravel

covered 23 m to river

19
- Gravel: poorly sorted, bouldery, poorly stratified to massive
- Diamicton: striated clasts, massive, sharp lower contact

Vertical scale (m): 30, 20, 10, 0

LEGEND
- *Alluvial sediments*
- *Glaciolacustrine sediments*
- *Glaciofluvial sediments*
- *Till*
- *Bedrock*

Geology by B.C. Ward and L.E. Jackson Jr., 1987-1989

Geological cartography by P. Corrigan, Geological Survey of Canada

Colour separations were produced using digital methods

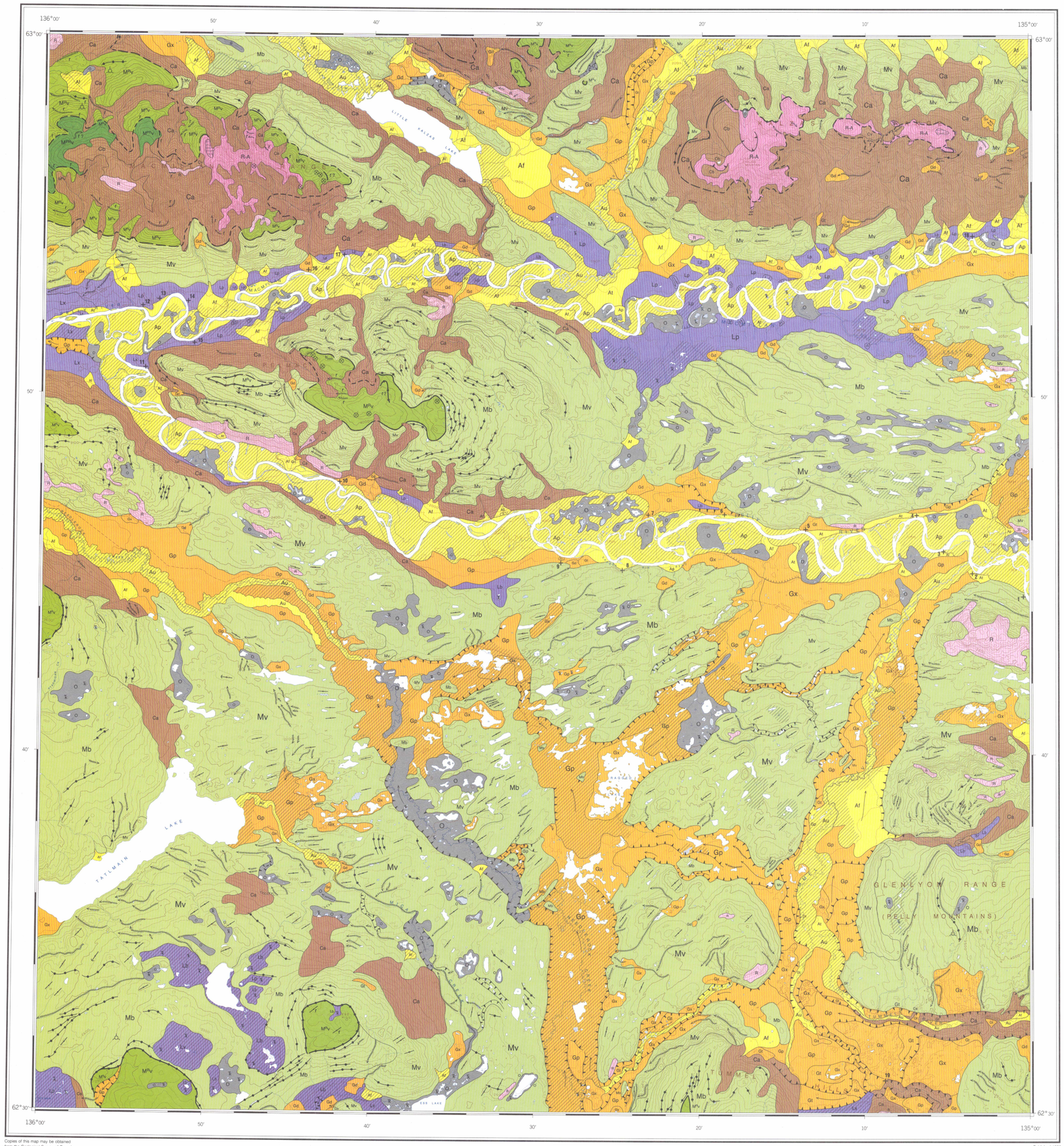
Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Base map assembled by the Geological Survey of Canada from maps 105 L/11, 12, 13, 14 (1970), published at 1:50 000 scale by the Surveys and Mapping Branch

Copies of the topographical editions covering this map area may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa, Ontario, K1A 0E9

Mean magnetic declination 1993, 29°54′ E, decreasing 11.4′ annually. Readings vary from 29°36′ E in the SW corner to 30°12′ E in the NE corner of the map

Elevations in feet above mean sea level



Copies of this map may be obtained from the Geological Survey of Canada:
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100 West Pender Street, Vancouver, B.C. V6B 1R8

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LOCATION MAP

MAP 1786A

SURFICIAL GEOLOGY

NEEDLEROCK CREEK

YUKON TERRITORY

Scale 1:100 000 - Échelle 1/100 000

Kilometres 2 0 2 4 6 8 Kilometres

Universal Transverse Mercator Projection

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

LEGEND

This legend is common to maps 1786A to 1789A, coloured legend blocks indicate map units that appear on this map

QUATERNARY

HOLOCENE - POST McCONNELL GLACIATION

O — ***ORGANIC DEPOSITS:*** *peat and muck several metres to tens of metres thick; formed predominantly by the accumulation of vegetative material in bogs and fens, depressions and valley bottoms. Permafrost is commonly present within 1 m of the surface in blanket bog; thermokarst collapse and palsa growth are common in bogs and fens*

E — ***EOLIAN DEPOSITS:*** *well sorted sand transported and deposited by wind action; greater than 1 m thick and generally forming parabolic and linear dunes*

COLLUVIAL DEPOSITS: *stony diamicton or rubble resulting from the breakdown of bedrock through physical and chemical weathering and the downslope movement of previously deposited surficial material, variably reworked and transported by gravitational processes such as creep, solifluction, debris flow, snow avalanching, and rockfall*

Cb — ***Colluvial blanket sediments:*** *diamicton or rubble; greater than 1 m thick*

Cv — ***Colluvial veneer sediments:*** *diamicton or rubble; less than 1 m thick and/or discontinuous*

Ca — ***Colluvial apron sediments:*** *bouldery diamicton, poorly sorted sand and gravel forming a wedge-like slope-toe complex of small steep debris flow and avalanche-dominated fans and solifluction deposits ranging from less than 1 m at the upslope limit to 10 m or more in the thickest part of the apron*

bCa — ***Rockfall deposits:*** *bouldery, angular rockfall deposits that form aprons up to 10 m or more in maximum thickness along the bases of steep slopes*

ALLUVIAL DEPOSITS: *gravel to silt size sediments deposited by streams; deposits are commonly stratified and moderately to well sorted, except for some alluvial fan deposits*

Ap — ***Floodplain sediments:*** *cobble to pebble gravel capped by sand and silt; greater than 1 m thick; includes lacustrine and organic deposits in abandoned channels and bog and fen areas; floodplain deposits subject to periodic inundation and reworking by floods*

At — ***Alluvial terrace sediments:*** *cobble to pebble gravel capped by sand and silt; greater than 1 m thick; underlies one or more benches along the margins of active floodplains*

Af — ***Alluvial fan sediments:*** *gravel, sand, silt, and diamicton up to 10 m or more thick; alluvial fans subject to stream avulsion and flooding and, on smaller and steeper fans, inundation by debris flows*

Au — ***Alluvial sediments, undivided:*** *floodplains, fans, and terraces that cannot be subdivided at this map scale*

WISCONSINAN - McCONNELL GLACIATION

GLACIOLACUSTRINE DEPOSITS: *well stratified sand, silt, clay, and minor gravel and diamicton deposited in lakes ponded by glacial ice; sediments may have regular surfaces or have ridged, hummocky, or pitted surfaces caused by meltout of buried glacial ice. They commonly contain segregated ground ice and are affected by contemporary thermokarst collapse and retrogressive thaw flow slides along rivers*

Lp — ***Glaciolacustrine plain:*** *sand, silt, and clay with minor dropstones; 5 m or more thick*

Lb — ***Glaciolacustrine blanket:*** *silt and clay with minor sand; 1 to 5 m thick*

Lv — ***Glaciolacustrine veneer:*** *silt and clay; less than 1 m thick or discontinuous*

Lx — ***Glaciolacustrine complex:*** *sand, silt, and clay; hummocky, pitted, and ridged; comprises up to 10 per cent gravel and diamicton layers and lenses and dropstones; usually more than 5 m thick*

GLACIOFLUVIAL DEPOSITS: *sand, gravel, and minor silt, greater than 1 m thick, deposited by streams flowing from or in contact with glacial ice, including deltas graded to former glacial lake levels. Sorting ranges from good to poor and stratification from thin bedded to massive. Sediments commonly display evidence of syndepositional collapse due to meltout of buried or supporting ice*

Gp — ***Glaciofluvial plain and fan sediments:*** *pebble to cobble gravel capped by sand and silt; greater than 1 m thick*

Gt — ***Glaciofluvial terrace sediments:*** *pebble to cobble gravel capped by sand and silt; greater than 1 m thick*

Gd — ***Glaciofluvial delta:*** *sand, gravel, and minor silt and clay; greater than 5 m thick*

Gx — ***Glaciofluvial complex:*** *sand, gravel, diamicton, and minor silt and clay; greater than 5 m thick; forming hummocks, kettles, esker and crevasse-fill ridges; includes minor elements of* Gp *and* Gt

MORAINAL DEPOSITS: *glacial diamicton, mainly till, generally consisting of a silty sandy matrix containing pebbles, cobbles, and minor boulders; deposited either directly by glacial ice or by gravity flow from glacier ice*

Mb — ***Till blanket:*** *greater than 1 m thick but conforming to the underlying topography*

Mv — ***Till veneer:*** *less than 1 m thick or discontinuous; in places contains extensive areas of thin (less than 1 m) and patchy colluvium*

MIDDLE PLEISTOCENE - REID GLACIATION

$G^{R}d$ — ***GLACIOFLUVIAL SEDIMENTS:*** *sand, gravel, and minor silt and clay; greater than 5 m thick; deposited as deltas by meltwater streams entering glacial and proglacial lakes*

$M^{R}v$ — ***MORAINAL DEPOSITS:*** *glacial diamicton, mainly till, generally consisting of a silty sandy matrix containing pebbles, cobbles, and minor boulders; less than 1 m thick or discontinuous; in places contains extensive areas of thin (less than 1 m) and patchy colluvium*

EARLY PLEISTOCENE - PRE-REID GLACIATION

$M^{PR}v$ — ***MORAINAL DEPOSITS:*** *glacial diamicton, mainly till, generally consisting of a silty sandy matrix containing pebbles, cobbles, and minor boulders; many of the clasts are highly weathered; less than 1 m thick or discontinuous; in places contains extensive areas of thin (less than 1 m) and patchy colluvium*

PALEOZOIC TO TERTIARY

R — ***BEDROCK:*** *includes areas of thin colluvial cover blockfields and sorted stone polygons in alpine areas*

R-A — *Bedrock areas subject to rapid mass wasting processes (rockfall and snow avalanches)*

Geological boundary
Cirque
Streamlined glacial bedform (ice flow direction known, unknown, Reid glaciation)
Moraine (McConnell glaciation, Reid glaciation)
Glacial limits
- *McConnell (defined, approximate, assumed)*
- *McConnell coincident with moraine*
- *Reid (defined, approximate, assumed)*
- *Reid coincident with moraine*

Esker (flow direction defined, undefined)
Subglacial and proglacial meltwater channel, McConnell (large, small, single wall of large channel), arrow indicates flow direction
- *Reid (small) arrow indicates flow direction*

Terrace (marking stages of formation)
Discontinuous organic deposits generally less than 1 m thick
Landslide (arrow indicates direction of movement)
Open system pingo
Tor
Cryoplanation terrace
Thermokarst collapse activity
Location of stratigraphic section 2+

Recommended citation:
Ward, B.C., and Jackson, L.E., Jr.
1993: Surficial geology, Needlerock Creek, Yukon Territory; Geological Survey of Canada, Map 1786A, scale 1:100 000

1786A

Canada