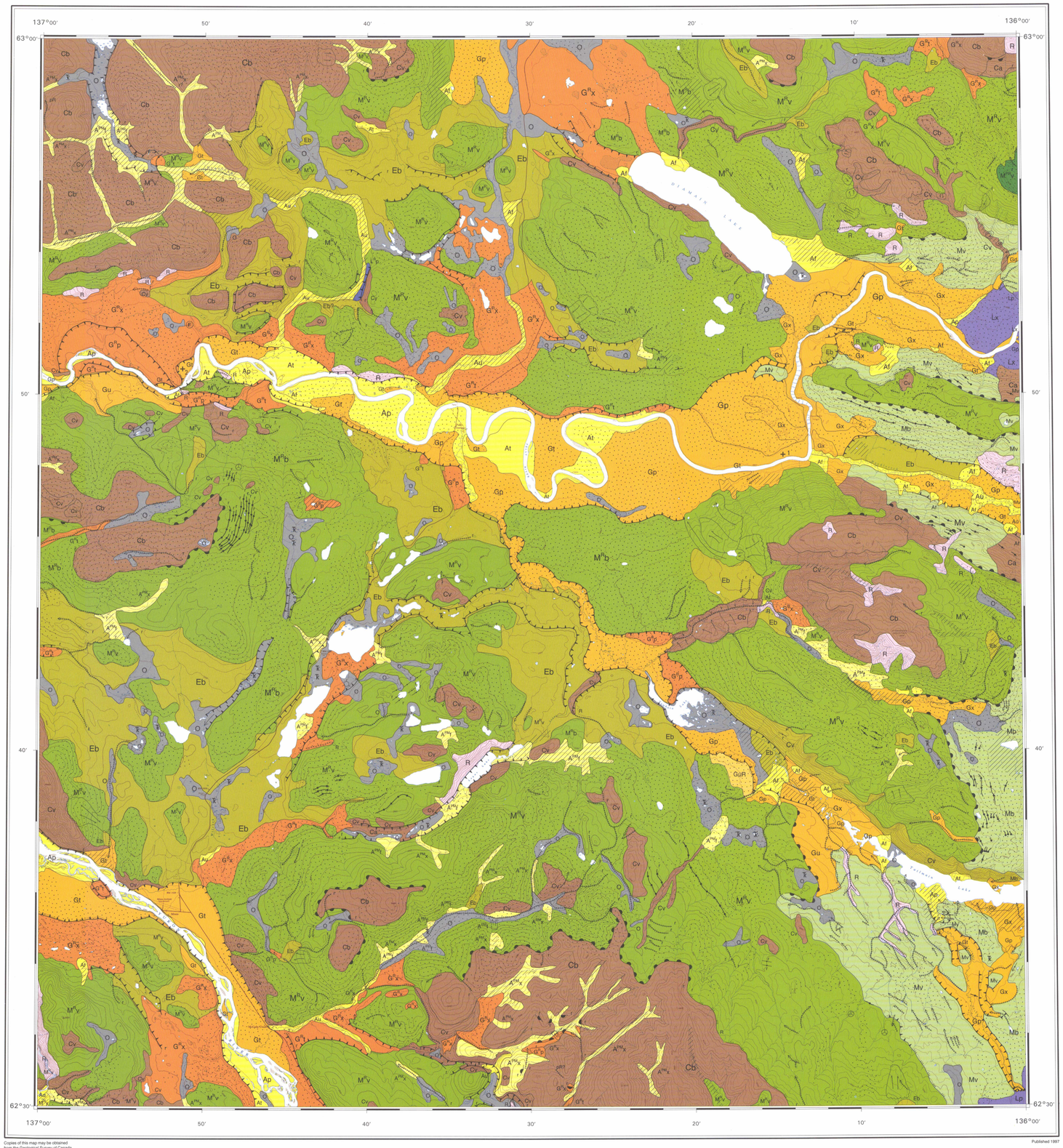
Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA



1

Bouldery gravel, clasts over the upper 2-5 m commonly contain imbricated boulders ranging from 1.0 to 1.6 m in diameter

Gravel fining upward into sand and silt. The upper 1.5 m contain organic silt and sand. These have yelded ^{14}C ages of 36 060± 2008P (AECV 1422C and 37 120± 350BP (TO-1279)

15m

Thinly bedded to laminated fine sand, silt, and minor clay

2

Sand with scattered gravel lenses (postglacial)

5m

Diversion Creek paleosol

Stratified sands and silts (McConnell outwash)

Stratified gravels, fines upward from a bouldery lag (outwash, McConnell Glaciation)

Pebbly sands (outwash, Reid Glaciation)

Stony diamicton, clasts highly striated (till, Reid Glaciation)

Fine sand, thrust faulted by glacial overriding

Interstratified sands and peat, cut by ice-wedge psuedomorphs and thrust faulted by glacial overriding. ^{14}C date of >41 000± BP (GSC 4510) determined on peat

LEGEND FOR STRATIGRAPHIC SECTIONS

QUATERNARY

POSTGLACIAL

Alluvial (Holocene) sands and gravels

MIDDLE TO LATE PLEISTOCENE

Glaciofluvial sediments, McConnell Glaciation

Paleosol developed between Reid and McConnell Glaciation

Stream deposited sediments (pre-McConnell Glaciation) of nonglacial origin (includes terrace gravels along Klaza River possibly deposited by outlet waters from a lake dammed by a glacial margin along the southern margin of Dawson range during Reid Glaciation)

EARLY TO MIDDLE PLEISTOCENE

Till, Reid Glaciation

Glaciofluvial sediment, Reid Glaciation

Glaciolacustrine sediments, Reid Glaciation

Alluvial deposits, deposited between the younger pre-Reid glaciation and Reid glaciation

LEGEND

Coloured legend blocks indicate map units that appear on this map
This legend is common to maps 1876A-1879A

CENOZOIC

QUATERNARY

HOLOCENE – POST-McCONNELL GLACIATION

ORGANIC DEPOSITS: *peat and muck formed predominently by the accumulation of vegetative material in bogs, fens, and swamps situated on valley bottoms and blanket bog on hillsides (see SYMBOLS below). Permafrost is commonly encountered within 1 m of the surface. Open system pingos are common in blanket bog and thermokarst collapse and palsa growth are common in bogs, fens, and swamps*

O — ***Bog, fen, and swamp deposits:*** *undivided; thickness < 1 m to 10 m*

ALLUVIAL DEPOSITS: *gravel to silt size sediments deposited by streams*

Ap — ***Floodplain sediments:*** *gravel, cobble to pebble; massive to thick bedded capped by sand and silt; flat lying; includes lacustrine and organic deposits in abandoned channels and backswamp areas subject to periodic inundation and reworking by floods; thickness 1 to 5 m*

At — ***Alluvial terrace sediments:*** *gravel, cobble to pebble with a sandy matrix; massive to thick bedded; capped by sands and silts; sediments are of flood plain origin now isolated from flooding by stream incisions; thickness 1 m to 10 m or more*

Af — ***Alluvial fan sediments:*** *gravel, sand, silt, and diamicton, poorly sorted; thick bedded to massive; sediments form fan-shaped landforms at the confluence of tributary streams with lower gradient trunk streams; subject to flooding accompanied by sudden stream migration and inundation by debris flows on fans with gradients in excess of 4%; thickness up to 10 m or more*

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

PLEISTOCENE AND HOLOCENE (UNDIVIDED)

EOLIAN DEPOSITS: *well sorted medium sand to coarse silt transported and deposited by wind action during the early postglacial and McConnell Glaciation. Thin deposits of very fine sand and coarse silt < 1 m thick are distributed discontinuously throughout low lying areas (see SYMBOLS below)*

Eb — ***Eolian sands:*** *sand, well sorted; massive; forms crescent-shape and linear dunes and featureless or gently undulating inter-dune eolian plains; thickness 1 to 5 m*

COLLUVIAL DEPOSITS: *stony diamicton resulting from the physical and chemical breakdown of bedrock and reworking and transportation by creep, solifluction, debris flow, snow avalanching, and rockfall. It also includes diamicton created by landsliding. Colluvial deposits may contain reworked glacial sediments within the limits of ice cover during the Reid and McConnell glaciations. Colluvial deposits beyond the limits of the McConnell Glaciation ice cover are likely the product of continuous formation and reworking over a significant part of the Pleistocene*

Cb — ***Colluvial blanket sediments:*** *diamicton, stony with a sandy matrix; massive; surface conforms to underlying bedrock or buried glacial deposits; thickness > 1 m to 50 m or more in large landslides*

Cv — ***Colluvial veneer sediments:*** *diamicton, stony with a sandy matrix; massive; thickness < 1 m to discontinuous over bedrock*

Ca — ***Colluvial apron sediments:*** *diamicton, bouldery diamicton and bouldery sandy gravel; poorly sorted; massive; sediments form a wedge-like slope-toe complex of small steep debris flow and avalanche-dominated fans and solifluction deposits; thickness is < 1 m at up and down slope limit to up to 5 m or more in the thickest part of the apron*

bCa — ***Rockfall sediments:*** *boulders, angular; massive; deposits form as rockfall accumulations along the bases of steep bedrock slopes; thickness ranges from < 1 m at margins to up to 10 m*

LATE PLEISTOCENE (WISCONSINAN) – McCONNELL GLACIATION

GLACIOLACUSTRINE DEPOSITS: *well stratified sand, silt, clay, deposited in lakes ponded by glacial ice. Glaciolacustrine sediments may have regular surfaces or have ridged, hummocky, or pitted surfaces caused by meltout of former supporting glacial ice . Glaciolacustrine silt and clay commonly contain extensive segregated ground ice. Consequently, they are widely affected by thermokarst collapse and retrogressive thaw landsliding along rivers*

Lp — ***Glaciolacustrine plain:*** *sand, silt, and clay with minor dropstones; thinly bedded to laminated; thickness > 5 m*

Lb — ***Glaciolacustrine blanket:*** *silt and clay with minor sand; thinly bedded to laminated; deposit conforms to underlying topography; thickness 1 m to 5 m*

Lv — ***Glaciolacustrine veneer:*** *silt and clay with minor sand; thinly bedded to laminated; deposit conforms to underlying topography; thickness < 1 m to discontinuous*

Lx — ***Ice-contact glaciolacustrine complex:*** *sand, silt, and clay; laminated to medium bedded with up to 10 percent lenticular beds of gravel and diamicton and dropstones; surface is hummocky, pitted, and ridged; thickness > 5 m*

GLACIOFLUVIAL DEPOSITS: *sands, gravels and minor silts > 1 m thick deposited by streams flowing away from, or in contact with glacial ice including deltas graded to former glacial lakes. 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 sediments:*** *pebble to cobble gravel; massive to thick bedded, capped by sand and silt; planar surface; thickness 1 to > 10 m*

Gt — ***Glaciofluvial terrace sediments:*** *pebble to cobble gravel; massive to thick bedded; incised into flights of terraces by glacial streams; thickness 1 to > 10 m*

Gd — ***Glaciofluvial delta sediments:*** *sand, gravel, and minor silt and clay; moderately to well sorted, texture becomes finer downward; massive to thick bedded; deposit has a planar surface and delta-form in plan view; thickness > 5 m*

Gx — ***Glaciofluvial ice stagnation complex sediments:*** *gravel, sand, diamicton, poorly to moderately sorted, and minor silt and clay; bedding thick to massive and commonly folded and faulted from syndepositional ice meltout; surface consists of hummocks, kettles, esker and crevasse-fill ridges with minor elements of units* **Gp, Gd,** *and* **Gt**

Gu — ***Discontinuous glaciofluvial sediments:*** *gravel and sand including elements of units* **Gp** *and* **Gx,** *discontinuously distributed in areas of units* **Mb** *and* **Mv**

MORAINAL DEPOSITS (TILL): *glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

Mb — ***Till blanket:*** *diamicton, stony with a silty, sandy matrix; massive to crudely stratified; surface conforms to the underlying topography; thickness 1 to 5 m*

Mv — ***Till veneer:*** *diamicton, stony with a silty, sandy matrix; massive to crudely stratified; may contain extensive areas of thin (< 1 m) to patchy colluvium over bedrock*

MIDDLE PLEISTOCENE – PRE-McCONNELL GLACIATION (UNDIVIDED)

ALLUVIAL DEPOSITS: *gravel and sand deposited by streams that were not fed by glacial meltwaters. Sediments may represent several cycles of alluviation and erosion. Sediments are not presently correlative to past glaciations but presumably predate McConnell Glaciation due to the presence of McConnell age loess overlying them. Basal gravels within these sediments commonly contain placer gold in basins draining Cretaceous granodiorite and andesite*

$A^{PM}f$ — ***Alluvial fans:*** *single fans or aprons of coalesced fans formed of gravel and sand, poorly to moderately sorted, thick bedded. Sediments disturbed by cryoturbation and clasts commonly wind sculpted. Thickness up to 10 m or more*

$A^{PM}x$ — ***Alluvial complex sediments:*** *gravel and sand, poorly to moderately sorted; thin to thick bedded, interstratified with colluvial diamicton, reworked loess, peat, and woody detritus; sediments underlie the floors and margins of narrow upland valleys and grade laterally (upslope) into colluvial blankets. They contain segregated ice lenses and ice wedges and are normally capped by blanket bog; sediments may represent several depositional cycles; thicknesses may exceed 10 m in mid-valley locations*

MIDDLE PLEISTOCENE – REID GLACIATION

ALLUVIAL DEPOSITS: *complexes of nonglacial and fan sands and gravels deposited by streams that flowed from ice-free areas toward Reid Glaciation ice margins. These sands and gravels locally overlie older interglacial gravels that contain placer gold*

$A^{R}t$ — ***Alluvial terrace sediments:*** *gravelly micaceous sand and gravel, moderately sorted, clasts angular to subangular; bedding a thin to massive and lenticular; gravel clasts are commonly frost shattered and wind sculpted; sediments have been incised into flights of terraces. Sediments are commonly cut by ice wedge waters pseudomorphs over their upper 2 m (includes terrace gravels along Klaza River possibly deposited by outlet waters from a lake dammed by a glacial margin during Reid Glaciation). Thickness 1 to 15 m*

$A^{R}f$ — ***Alluvial fans:*** *single fans or aprons of coalesced fans formed of gravel and sand, poorly to moderately sorted, thick bedded. Sediments disturbed by cryoturbation and clasts commonly wind sculpted. Thickness up to 10 m or more*

$A^{R}x$ — ***Alluvial complex sediments:*** *gravel and sand, poorly to moderately sorted; thin to thick bedded, interstratified with colluvial diamicton, reworked loess, peat, and woody detritus; sediments underlie the floors and margins of narrow upland valleys and grade laterally (upslope) into colluvial blankets. They contain segregated ice lenses and ice wedges and are normally capped by blanket bog; sediments may represent several depositional cycles; thicknesses may exceed 10 m in mid-valley locations*

GLACIOLACUSTRINE DEPOSITS: *well stratified sand, silt, clay, and minor gravel and diamicton deposited in lakes ponded by glacial ice. Glaciolacustrine silts and clays commonly contain segregated ground ice ice and are affected by contemporary thermokarst collapse*

$L^{R}p$ — ***Glaciolacustrine plain:*** *sand, silt, and clay, with minor dropstones; thinly bedded to laminated; thickness 1 to > 5 m*

GLACIOFLUVIAL DEPOSITS: *gravel and sand deposited by streams flowing away from, or in contact with glacial ice*

$G^{R}p$ — ***Glaciofluvial plain sediments:*** *gravel and sand, moderately to well sorted; thick bedded to massive; planar surface; thickness 1 to 10 m or more*

$G^{R}t$ — ***Glaciofluvial terrace sediments:*** *pebble to cobble gravel; massive to thick bedded; incised into flights of terraces by glacial streams; thickness 1 to > 10 m*

$G^{R}d$ — ***Glaciofluvial delta sediments:*** *sand, gravel and minor silt and clay, moderately to well sorted and becomes finer downward; massive to thick bedded; planar surface, deposit is delta form in plan view; thickness > 5 m*

$G^{R}x$ — ***Glaciofluvial ice stagnation complex sediments:*** *gravel, sand, diamicton, poorly to moderately sorted, and minor silt and clay; bedding thick to massive and commonly folded and faulted from syndepositional ice meltout; surface consists of hummocks, kettles, esker and crevasse-fill ridges with minor elements of units* $G^{R}p$, $G^{R}d$, *and* $G^{R}t$

MORAINAL DEPOSITS (TILL): *glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

$M^{R}b$ — ***Till blanket:*** *diamicton, stony, silty sandy matrix; massive; conforms to underlying topography; thickness 1 to 5 m*

$M^{R}v$ — ***Till veneer:*** *diamicton, stony, silty sandy matrix; massive; discontinuous and may contain extensive areas of thin (< 1 m) and patchy colluvium over bedrock*

EARLY PLEISTOCENE – YOUNGER PRE-REID GLACIATION

GLACIOFLUVIAL DEPOSITS: *gravel and sand deposited by streams flowing away from glacial ice in meltwater channels and outwash planes. Thick bedded to massive; clasts, except for quartz, quartzite, and chert are disaggregated or weathered to clay over the upper 2 m of the sediments where they underlie the surface; clasts near the surface of the unit are intensely wind sculpted and this interval is cut by ice wedge pseudomorphs and sand wedges; thickness 1 m to > 5 m*

$G^{PR}p$ — ***Glaciofluvial plain sediments:*** *gravel and sand, deeply weathered; forms an unincised plain*

$G^{PR}t$ — ***Glaciofluvial terrace sediments:*** *gravel and sand, deeply weathered; incised into flights of terraces*

MORAINAL DEPOSITS (TILL): *glacial diamicton, mainly till, generally consisting of a matrix ranging from sand to clay that supports clasts ranging from boulders to pebbles in size; deposited either directly from glacial ice or by gravity flow from glacial ice*

$M^{PR}v$ — ***Till veneer:*** *patchy, deeply weathered diamicton. Matrix sandy silty clay. Formerly feldspar-rich stones are weathered to clay*

EARLY PLEISTOCENE

VOLCANIC ROCK and INTERSTRATIFIED SEDIMENTS

V — ***Pleistocene volcanics (undivided):*** *basalt, breccia, volcanic ejecta and hyaloclastite of the Selkirk volcanics erupted during the early and late Pleistocene or early Holocene epochs in the Fort Selkirk area. Cumulative basalt flow thicknesses exceed 100 m where they have filled valleys. Deposits of the two known pre-Reid glaciations and at least one nonglacial period are locally interstratified with the volcanics and are exposed only in sections*

PALEOZOIC AND MESOZOIC

R — ***PRE-QUATERNARY BEDROCK:*** *basalt, andesite, greenstone, schist, gneiss, greywacke, granodiorite and monzonite: includes areas of thin colluvial cover, blockfields, sorted stone polygons in alpine areas*

R-A — ***AVALANCHE MODIFIED PRE-QUATERNARY BEDROCK:*** *bedrock areas subject to rapid mass wasting processes (rockfall and snow avalanches)*

SYMBOLS

Note: **pR** *- pre-Reid glaciations,* **r** *- Reid Glaciation,* **pM** *- pre-McConnell Glaciation, (no designator, assume McConnell Glaciation)*

Geological boundary

Blanket bog covering generally less than 1 m thick

Discontinuous eolian sands or silts, thickness locally up to 2 m

Open system pingo, collapsed open system pingo

Thermokarst collapse activity

Landslide, arrow(s) indicate direction of movement

Cirque: degraded cirque active prior to McConnell Glaciation

Arête: degraded arête active prior to McConnell Glaciation

Streamlined glacial bedforms: ice flow direction known, unknown

Meltwater channel; large, small ice-walled channel, arrow indicates flow direction

Esker: flow direction defined, unknown

End moraine

Recessional moraine

Ice-contact face in stratified drift (teeth on ice side)

Ice limit

Cryoplanation terrace

Tor

Vertebrate fossil locality — F

Stratigraphic section — 2+

LOCATION MAP

Surficial geology by L.E. Jackson Jr. 1988-1992, Geological Survey of Canada

Digital cartography by J.D. Narraway, Geoscience Information Division

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

MAP 1878A

SURFICIAL GEOLOGY

GRANITE CANYON

YUKON TERRITORY

Scale 1:100 000 - Échelle 1/100 000

Kilometres 2 0 2 4 6 8 Kilometres

Universal Transverse Mercator Projection

Projection transverse de Mercator

Base map assembled and modified by the Geoscience Information Division from maps 115-I/1D (1984), 115-I/9 (1962), 115-I/15,16 (1961) published at the scale of 1:50 000 by the Surveys and Mapping Branch

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

Mean magnetic declination 1997, 28°28′ E, decreasing 12.1′ annually. Readings vary from 28°11′ E in the SW corner to 28°44′ E in the NE corner of the map

Elevations in feet above mean sea level

115-I/13	115-I/14	115-I/15	115-I/16
1877A		1878A	
115-I/12	115-I/11	115-I/10	115-I/9
115-I/5	115-I/6	115-I/7	115-I/8
1876A		1879A	
115-I/4	115-I/3	115-I/2	115-I/1

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

Canada

Published 1997

Recommended citation:
Jackson, L.E., Jr.
1997: Surficial geology, Granite Canyon, Yukon Territory; Geological Survey of Canada, Map 1878A, scale 1:100 000