

This is a common map legend for the surficial geology of northern Alberta. Coloured legend blocks indicate map units that appear on this map. Not all map symbols shown in the legend necessarily appear on this map.

UNIT	UNIT NAME	DESCRIPTION AND GENESIS
QUATERNARY HOLOCENE		
A	ANTHROPOGENIC MATERIALS:	Culturally made or modified geological materials such that their physical properties (e.g., structure, cohesion, compaction) have been drastically altered.
O	ORGANIC DEPOSITS:	Undifferentiated peat (woody to fibrous muck) occurring in undifferentiated wetlands; commonly underlain by fine-grained, poorly drained glaciolacustrine deposits; includes marshes, swamps, bogs and fens.
OB	Bog peat:	Occurs in a peatland with a fluctuating water table and commonly a raised surface; peatland surface is dominated by sphagnum mosses, heath shrubs and short, stunted trees.
OF	Fen peat:	Occurs in a peatland with water table at surface and slow internal drainage; peatland surface is dominated by sedges, with grasses and reeds near local pools, and is sparsely treed.
C	COLLUVIAL DEPOSITS:	Materials that have reached their present position as a result of direct, gravity-induced movement; commonly occurs as slope and slump deposits confined to valley slopes and floors; includes pre-existing bedrock, till, glaciolacustrine, glaciofluvial and eolian sediments, generally poorly sorted.
F	FLUVIAL DEPOSITS:	Sediments transported and deposited by streams and rivers; synonymous with alluvial. Includes well-sorted stratified sand, gravel, silt, clay and organic sediments occurring in channel and overbank deposits (e.g., postglacial floodplains, terraces, fans and deltas).
L	LACUSTRINE DEPOSITS:	Sediments deposited in and adjacent to recent and modern lakes; offshore sand, silt and clay; littoral (nearshore) beaches and bars; sand, silt and minor gravel; minor organic deposits.
E	EOLIAN DEPOSITS:	Wind-deposited sediments; well-sorted, medium to fine-grained sand and minor silt (loess); generally massive to locally cross bedded or ripple laminated; includes both active and vegetated deposits.
PLEISTOCENE		
LG	GLACIOLACUSTRINE DEPOSITS:	Primarily fine-grained, distal sediments deposited in or along the margins of glacial lakes, including sediments released by the melting of floating ice. Includes laminated (rhythmically bedded) to massive fine sand, silt and clay, and may contain ice-rifted stones.
LGL	Littoral and nearshore sediments:	Massive to stratified, well-sorted silty sand, pebbly sand and minor gravel; occurs as beaches, bars, spits and forest deltaic deposits deposited during regression and lowering of glacial lakes.
FG	GLACIOFLUVIAL DEPOSITS:	Sediments deposited by glacial meltwater streams as subaerial or subaqueous outwash. Includes sand and gravel, often stratified, minor silt, and may show evidence of ice melting (slumped structures). Features include meltwater channels, kettle holes, terraces and minor ice-contact sediments.
FGI	Ice-contact sediments:	Sediments deposited by glacial meltwater streams in direct contact with glacial ice, either in front of (kame terraces) or within (eskers, crevasse ridges) glacial ice. Includes massive to stratified, poor to moderately sorted, coarse sediments (predominantly pebble gravel and coarse sand, locally till) and may show evidence of ice melting (slumped structures).
M	MORAINES:	Nonsorted diamiction (till) deposited directly by glacial ice consisting of a mixture of clay, silt, sand and minor pebbles, cobbles and boulders. Locally, this unit may contain blocks of bedrock, pre-existing stratified sediment and till, and lenses of glaciolacustrine and/or glaciofluvial sediment.
MS	Stagnant ice moraine:	Material resulting from the collapse and lateral movement of englacial and supraglacial sediment in response to melting (ablation) of buried stagnant ice at the ice margin; sediment is mainly diamicton, but locally includes stratified sediments of glaciolacustrine or glaciofluvial origin. Characterized by low to high-relief hummocky topography.
MT	Ice-thrust moraine:	Terrain resulting from glacio-tectonic transport of originally subglacial material deposited by the glacier more or less intact; deposits may include syngenetic till, as well as masses of pre-existing till, stratified drift and/or bedrock. Characterized by high to moderate relief and features include hill-hole pairs and glacio-tectonic moraine ridges.
MF	Fluted moraine:	Glacially streamlined terrain; varies from alternating furrows and ridges to nearly equidimensional smoothed hills; all landforms parallel the local ice flow direction; includes flutes, drumlins and drumlinoids.
FP	PREGLACIAL FLUVIAL DEPOSITS:	Sediments transported and deposited by streams and rivers prior to glaciation. Includes sand and gravel deposits occurring in paleovalleys (i.e., preglacial floodplains, terraces, fans and deltas); ranging from middle Wisconsin to late Tertiary.
PRE-QUATERNARY		
RT	UNCONSOLIDATED FLUVIAL GRAVELS:	Predominately well-sorted, quartzite and chert gravel and cobbles; Cordilleran source, Paleogene (Tertiary) to early Quaternary.
R	BEDROCK:	Undifferentiated; may include clastic sedimentary rock, shale, carbonate and crystalline (Shield), Kimberlite and/or coal.

SYMBOL LEGEND	
Permafrost; relict and/or active	
Thermokarst depression	
Landslide and active layer failure scar (small)	
Landslide and active layer failure scar (large)	
Eolian forms; dune ridges	
Beach or strandline	
Wave-cut bench	
Escarpment	
Meltwater channel (minor)	
Meltwater channel (minor, flow indicated)	
Meltwater channel (major)	
Meltwater channel (major, flow indicated)	
Crevasse filling	
Ice-contact slope	
Kettle	
Esker, direction of paleoflow unknown	
Esker, direction of paleoflow indicated	
Drumlinoid or streamlined landform	
Drumlinoid, down-ice flow indicated	
Buried drumlinoid or streamlined landform	
Minor moraine ridge	
Major moraine ridge	
Iceberg scour	
Ice thrust ridge	
Stiation (direction unknown)	
Stiation (direction known)	
Bedrock outcrop	
Gravel and/or sand pit	
Section of stratigraphic interest	

BASEMAP LEGEND	
Road-paved-primary	
Road-gravel-primary	
Road-paved-secondary	
Road-improved	
Road-unimproved	
Trail-truck	
Hamlet	
River	
Lake	
UTM, Zone 11 Grid	
Contour, intervals 50 metres	

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84K	
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UNIT NOTATION	
Example: GLACIOLACUSTRINE plain	
Textural modifier	GL p
Genetic unit	
Geomorphic modifier	
Textural Modifier	
Textural characteristics may be applied to the terrain classification as a prefix based on field observations or by inference from distinctive genesis and/or morphology. When two modifiers are given, the second letter is the dominant texture, with the first letter indicating the secondary texture; i.e., cc for sandy clay.	
p	= pebble
g	= gravel
s	= sand
sl	= silt
c	= clay
a	= sand-silt-clay
GENETIC & GEOMORPHIC MODIFIERS	
c	crevasse fill
d	doughnut rings and ridges
e	eroded
f	fan
g	gullied
h	hummock
k	collapse
m	meander
p	plain
r	ridged
s	slumped
t	terrace
u	undulating
v	venerer
w	washboard
y	dissected
z	delta
Complex	
Where two or more classes of terrain are interspersed in a mosaic or repeating pattern on a scale too small to warrant meaningful differentiation, the proportion of each component in the combination is given in a two or three position designation set off by slashes denoting arbitrary percentage limits. For example,	
MpLGV means the area is underlain by approximately 60% morainal plain and up to 40% glaciolacustrine veneer.	
MvLGVFGp means at least 60% of the area is underlain by morainal veneer, with up to 40% glaciolacustrine veneer and less than 15% glaciofluvial plain.	
LGP/M means more than 60% of the area is underlain by a glaciolacustrine plain, with less than 15% moraine.	
Stratigraphic Sequence	
Where materials of different origins or textures are known to be superimposed or can be confidently inferred, the sequence is indicated in conventional order using vertical separators, such as:	
sLGV Mp	
This sandy glaciolacustrine sediment deposited on morainal plain	
Transitional Association	
Locally, two or more terrain units are juxtaposed by reason of related origin, temporal sequence or ambiguous geomorphic distinction. In the last case, both components may be present. Such situations are identified by a compound designation marked by a hyphen. Examples: *FGz-LGz* indicating ice-contact delta indistinguishable from glaciolacustrine delta, or *FGk-MSH* indicating ice-contact kame and kettle topography that blends with hummocky stagnant ice moraine.	
Morphologic Overprint	
Where a sequence of geomorphic processes has produced a multi-aspect or compound terrain fabric, the geomorphic modifier suffixes are appended in the inferred order of superposition. *Mpy* means a plain of till has been moulded into ridge forms and finally dissected by modern streams. *FGph* means a glaciofluvial plain has been discontinuously covered by ice-contact hummocks and ridges.	

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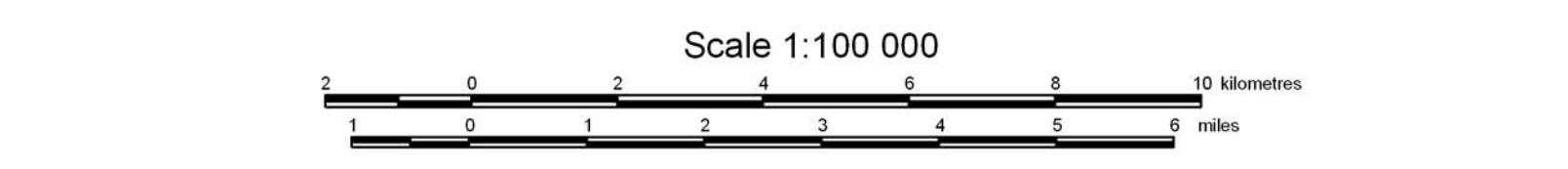
Selected Bibliography
 Bayrock, L.A. (1960). Surficial geology, appendix; in Exploratory soil survey of Alberta map sheets 84J, 84K and 84L; Research Council of Alberta, Preliminary Soil Survey Report 60-1, p. 43-49.
 Edwards, W.A.D., Budney, H.D., Berezniuk, T. and Butkovic, L. (2004). Sand and gravel deposits with aggregate potential, Mount Watt, Alberta (NTS 84K); Alberta Energy and Utilities Board, EUB/AGS Map 308, scale 1:250 000.
 Fox, J.C. (1984). Aggregate resources of the Mount Watt map area, NTS 84K; Alberta Research Council, Map A84K, scale 1:250 000.
 Fox, J.C., Richardson, R.J.H. and Sham, P.C. (1987). Surficial geology of the Peace River - High Level Area, Alberta; Alberta Energy and Utilities Board, EUB/AGS Map 295, scale 1:500 000.
 Lemmen, D.L., Duk-Rodkin, A. and Bednarski, J.M. (1994). Late glacial drainage systems along the northwestern margin of the Laurentide Ice Sheet; Quaternary Science Reviews, v. 13, p. 805-828.
 Lindsay, J.D., Pawluk, S. and Odymsky, W. (1960). Exploratory soil survey of Alberta map sheets 84J, 84K and 84L; Research Council of Alberta, Preliminary Soil Survey Report 60-1, 49 p.
 Mathews, W.H. (1980). Retreat of the last ice sheets in northeastern British Columbia and adjacent Alberta; Geological Survey of Canada, Bulletin 331, 22 p.
 Paulen, R.C. and Plouffe, A. (2007). Surficial geology of the Bushie River - Ponton River area (NTS 84K/NE); Alberta Energy and Utilities Board, EUB/AGS Map 413 and Geological Survey of Canada, Open File 5525, scale 1:100 000.
 Plouffe, A., Kowalchuk, C.J. and Paulen, R.C. (2007). Surficial geology, Meander River, Alberta (NTS 84K/NW); Geological Survey of Canada, Open File 5461, Alberta Energy and Utilities Board, EUB/AGS Map 414, scale 1:100 000.
 Plouffe, A. and Paulen R.C. (2007). Surficial geology, Caribou Creek, Alberta (NTS 84K/SW); Geological Survey of Canada, Open File 5460, Alberta Energy and Utilities Board, EUB/AGS Map 415, scale 1:100 000.
 Tokarsky, O. (1972). Hydrogeology of the Mount Watt area, Alberta; Alberta Research Council, Alberta Geological Survey, Earth Sciences Report 1972-03, 10 p.

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EUB/AGS Map 412
GSC Open File 5526

Surficial Geology of the La Crête Area (NTS 84K/SE)

Geology by: R.C. Paulen and A. Plouffe



Projection: Universal Transverse Mercator
 Datum: North American Datum, 1983
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