GEOLOGICAL SURVEY OF CANADA COMMISSION GÉOLOGIQUE DU CANADA

DEPARTMENT OF ENERGY, MINES AND RESOURCES
MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES

EXPLANATION OF LETTER NOTATION

A combination of letters is used to designate each map unit or component of compound map units, e.g. gAf. The upper case letter indicates the broad compositional-genetic class. The lower case letter(s) that generally follows indicates morphology. The lower case letter(s) preceding the central upper case letter describes texture. This specific texture term is used where it is possible to specify the texture more precisely than is indicated by the compositional-genetic term. A comma separating two textural symbols (s,c) indicates that both textural types are present but that the first is predominant; a diagonal (f/c) indicates that material of the first texture overlies material of the second.

In certain cases the map unit designator ends with an italicized letter(s) that is separated from the other letters by a dash, e.g. Mp-F. This final letter indicates that the area has been modified or eroded in a specific way. One term placed above another, e.g. $\frac{sEvr}{sGp}$, indicates a stratigraphic succession within the unit.

TEXTURAL MODIFIERS	COMPOSITIONAL-GENETIC CLASSES	MORPHOLOGIC MODIFIERS	PROCESS OR FORM MODIFIERS
a - gravelly or sandy	A - Alluvium: silt, sand, gravel	d - delta	A - active alluviation
c - clayey	C - Colluvium: various materials	f - fan	G - glacially ice thrust
f - clay, silt, and fine sand	E - Eolian deposit: silt, sand	h - hummocky	K - thermokarst
g - gravelly	G - Glaciofluvial deposit: sand, gravel	m - undulating	V - gullied
s - sandy	L - Lacustrine deposit: clay, silt, sand	n - moderately sloping	
x - complex mixture	M - Moraine: clayey till	p - plain	
	M- Marine deposit: clay, silt	r - ridged	
	O - Organic deposit: peat	s - steeply sloping	
	R - Bedrock	t - terraced	
	X - Complex deposit	v - veneer (generally 0.5-1.5 m thick)	

Geological boundary (defined; approximate; assumed)
Early Wisconsin(?) glacial limit (defined; approximate; assumed)
Marine beach, bar or spit (gravel or sand; sand)
Periodically active coastal escarpment more than 8 m high (unconsolidated material; bedrock in part)
Inactive coastal escarpment more than 8 m high (unconsolidated material; bedrock in part)
Sand dunes (inactive)
Stream-trimmed scarp, periodically undercut (unconsolidated material)
Stream-trimmed scarp (unconsolidated material; bedrock in part)
Meltwater-trimmed scarp (unconsolidated material; bedrock in part)
Direction of meltwater flow

DESCRIPTION OF TERRAIN UNITS

SYMBOL	NAME	MATERIALS AND THICKNESS	PERMAFROST DISTRIBUTION AND ICE CONTENTS	GEOMORPHOLOGY AND DRAINAGE	ORIGIN AND AGE
$\frac{cCv}{Rn}$	Clayey colluvium over bedrock	Clay and silty clay (weathered shale) containing some cobbles and boulders; 1-2 m thick. Swales contains peat 2-5 m thick.	Continuous permafrost; moderate to low ice contents.	Upland with gentle to moderate slopes and integrated drainage network. Moderately well drained with small pools along ice-wedge networks and beaded streams. Undisturbed slopes relatively stable.	Colluvium formed through weathering of bedrock and downslope movement.
sEr	Sand dune	Sand containing few layers of peat and twigs; 3-15 m thick.	Continuous permafrost with low to nil ice contents.	Small ridges and hills; active blowouts common; well drained.	Source of windblown sand is associated glaciofluvial deposits.
sAt fAt	Fluvial terrace	Sand with isolated silty beds (sAt) or silt with clayey and sandy beds (fAt); generally more than 5 m thick. Channel traces contain up to 3 m of peat.	Isolated taliks may be present; moderate ice contents due to ice lenses in sediments.	Flat terraces show relief to 5 m due to former channels and point bars. Drainage variable with thaw pools, lakes, and marshy areas common.	Terraces formed during downcutting of small streams and Horton River.
fAp	Alluvial plain	Silt, fine sand, and clayey silt, commonly organic; generally more than 6 m thick. Thin local accumulations of peat present.	Irregular distribution of permafrost; medium ice contents in frozen sediment due to presence of ice lenses.	Flat floodplain or low terrace near sea level; thaw pools, lakes, and marshy areas common; low surfaces occasionally inundated by sea water.	Alluvium deposited by Horton River before its breakthrough to the Amundsen Gulf just south of the map area.
cAf	Alluvial fan	Clay and clayey silt with isolated pebbles and sandy layers; up to 10 m thick.	Rare taliks in continuous permafrost; moderate ice contents due to presence of ice lenses.	Sediment is periodically deposited on surface of alluvial fans by ephemeral streams; moderately well drained except near base of fans.	Alluvial fans formed by small streams eroding steep bedrock scarps adjacent to cliffs along Old Horton Channel and Amundsen Gulf.
f/cMp	Marine plain	Fine silty sand over clay; sand is 1-5 m thick; clay 2-10 m thick.	Continuous permafrost. Silty sand has medium to high ice contents with large ice wedges; clay has low to medium ice contents with reticulate network of ice lenses.	Gently sloping plain interrupted only by few shallow thermokarst depressions, stream courses, and sand dunes; imperfect to poor drainage with thaw pools common along icewedge networks.	Marine sediments deposited prior to early Wisconsin time. Part of silty sand may have a glaciofluvial origin; upper part may have been subsequently reworked by wind.
fMp	Marine plain	Interbedded silty sand, silt, and clayey silt overlain by fine silty sand. Sand is 1-5 m thick; interbedded sediments generally less than 7 m thick. Few thin gravel layers present at high elevations.	Continuous permafrost. Silty sand has medium to high ice contents with large ice wedges; interbedded sediment has low to medium ice contents due to presence of ice lenses.	Gently sloping plain interrupted only by few shallow thermokarst depressions, stream courses, and sand dunes; imperfect to poor drainage with thaw pools common along icewedge networks.	Marine sediments deposited prior to early Wisconsin time. Part of silty sand may have a glaciofluvial origin; upper part may have been subsequently reworked by wind.
fMp-K	Marine plain; modified by thermokarst	Interbedded silty sand, silt, and clayey silt overlain by fine silty sand. Sand is 1-5 m thick interbedded sediments generally less than 7 m thick. Few thin gravel layers present at high elevations. Depressions contain 1.5-3 m of lacustrine deposits and peat.	Rare isolated taliks under depressions within continuous permafrost. Silty sand has medium to high ice contents with large ice wedges; interbedded sediment has low to medium ice contents due to presence of ice lenses.	Gently sloping plain interrupted by numerous shallow thermokarst depressions; imperfect to poor drainage, marshy in depressions.	Marine sediments deposited prior to early Wisconsin time. Part of silty sand may have a glaciofluvial origin; upper part may have been subsequently reworked by wind and thermokarst; thermokarst development and subsequent drainage of lake basins mainly during last 10 000 years.
fMp-A	Tidal flats	Interbedded silt, clayey silt, and sand; 1-8 m thick.	Irregular distribution of permafrost; ice lenses in frozen sediments.	Flat; poorly drained and marshy surface; frequently inundated by sea water.	Deposition continuing at present. Most of underlying marine sediment deposited during last 5000 years.
aMr-A	Marine spits and bars	Sand and gravel; 0.5-3 m thick.	Irregular distribution of thin permafrost; low ice contents in frozen sediment.	Low broad ridges rising up to 3 m a.s.l.	Ridges formed and continuously modified by wave action.
sGp gGp	Outwash plain	Sand (sG) or gravel (gG); gravel contains abundant sand and sandy beds; thickness ranges from 3 m to more than 10 m.	Continuous permafrost with low ice contents.	Flat plain with little relief due to terracing and relict channel traces and bars. Well drained, but extensive flat areas and channel traces are imperfectly drained with many thaw pools.	Higher levels of outwash east of Old Horton Channel, deposited when Laurentide glaciers stood at their maximum extent during early Wisconsin(?) glaciation in Amundsen Gulf. Remainder of outwash along Old Horton Channel deposited by meltwater flowing down Horton River from its headwater during same and subsequent glaciations.
fLp	Lacustrine plain and pond	Interbedded silt, clayey silt, and silty sand with peaty layers; 1.5-8 m thick. Surface patches of peat 1.5-3 m thick.	Rare isolated taliks present within continuous permafrost; ice contents generally medium to high due to numerous ice lenses.	Flat to gently sloping surface commonly marked by benches separated by small scarps. Surface commonly marshy with small lakes and thaw pools.	Lake basins formed by thermokarst development mainly during last 10 000 years and subsequently infilled and drained through normal stream development.
gGm-K	Hummocky thermokarst modified outwash	Gravel with interbeds of sand; may contain few unmapped areas of till; outwash is 5-15 m thick.	Continuous permafrost; ice contents variable; isolated layers of massive ice.	Rolling surface with 10-30 m local relief; well drained. Retrogressive thaw flow slides along recently steepened slopes.	Outwash deposited when early Wisconsin(?) glacier stood at its maximum extent; thermokarst, modifying unit morphology, occurred mainly during last 10 000 years.
Mm-K	Rolling moraine; modified by thermokarst	Clayey diamicton containing pockets of sorted silty and clayey material; 4-12 m thick. Depressions contain 2-8 m of lacustrine sediment and peat.	Continuous permafrost; ice content of diamicton low to high due to presence of ice lenses.	Rolling topography with 10-40 m local relief; moderately well drained but few depressions imperfectly drained. Retrogressive thaw flowslides on recently steepened slopes.	Till deposited when early Wisconsin(?) glacier stood at its maximum extent in Amundsen Gulf; thermokarst, modifying unit morphology, occurred mainly during last 10 000 years.
$\frac{Mv}{fMp-K}$	Hummocky till-veneered marine deposits; modified by thermokarst	Clayey diamicton over marine clay, silt, and fine sand. Diamicton generally varies from 0.5-2.5 m thick, rarely to 6 m. Depressions contain 1.5-8 m of lacustrine deposits and peat.	Rare isolated taliks present under depressions within continuous permafrost. Ice contents variable in diamicton; massive ice present in places near base of diamicton. Marine sediments have low to high ice contents; ice lenses commonly form reticulate network; isolated layers of massive ice.	Rolling topography with 10-30 m local relief; hills and slopes moderately well drained; depressions imperfectly to poorly drained and marshy.	Till deposited during maximum extent of Laurentide glaciers during early Wisconsin(?). Most ground ice formed concurrent with deglaciation. Thermokarst, modifying unit morphology, occurred mainly during last 10 000 years.
$\frac{Mv}{Rn}$	Till veneer on bedrock	Clayey diamicton over Cretaceous shale; diamicton up to 5 m thick. Low areas may contain 1.5-3 m of peat.	Isolated taliks present under depressions within continuous permafrost; ice contents variable in diamicton; massive ice present in places near base of diamicton.	Sloping plain with 10-30 m local relief due to stream incision. Uplands moderately well drained; valleys imperfectly to poorly drained.	Till deposited during maximum extent of Laurentide glaciers during early Wisconsin(?). Most ground ice formed concurrent with deglaciation. Thermokarst, modifying unit morphology, occurred mainly during last 10 000 years.
Rs	Bedrock escarpment	Cretaceous shale; sporadic cover of weathered shale to 1 m in thickness.	Continuous permafrost; low ice contents.	Escarpment with steep slopes and numerous ravines; well drained.	Escarpments formed by incision of Horton River during the Pleistocene.

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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 published at the same scale by the Army Survey Establishment in 1960

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Mean magnetic declination 1980, 42°16.7' East, decreasing 12.4' annually. Readings vary from 41°00' in the SW corner to 43°23.5' in the NE corner of the map area

Elevations in feet above mean sea level

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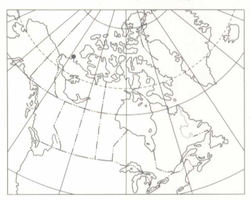

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MAP 30-1979

SURFICIAL GEOLOGY

MALLOCH HILL

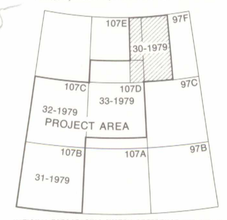
DISTRICT OF MACKENZIE

Scale 1:250 000

Kilometres 6 0 6 12 18 Kilometres
Miles 4 0 4 8 Miles

Universal Transverse Mercator Projection

Printed by the Surveys and Mapping Branch, 1981



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

MAP 30-1979
MALLOCH HILL
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