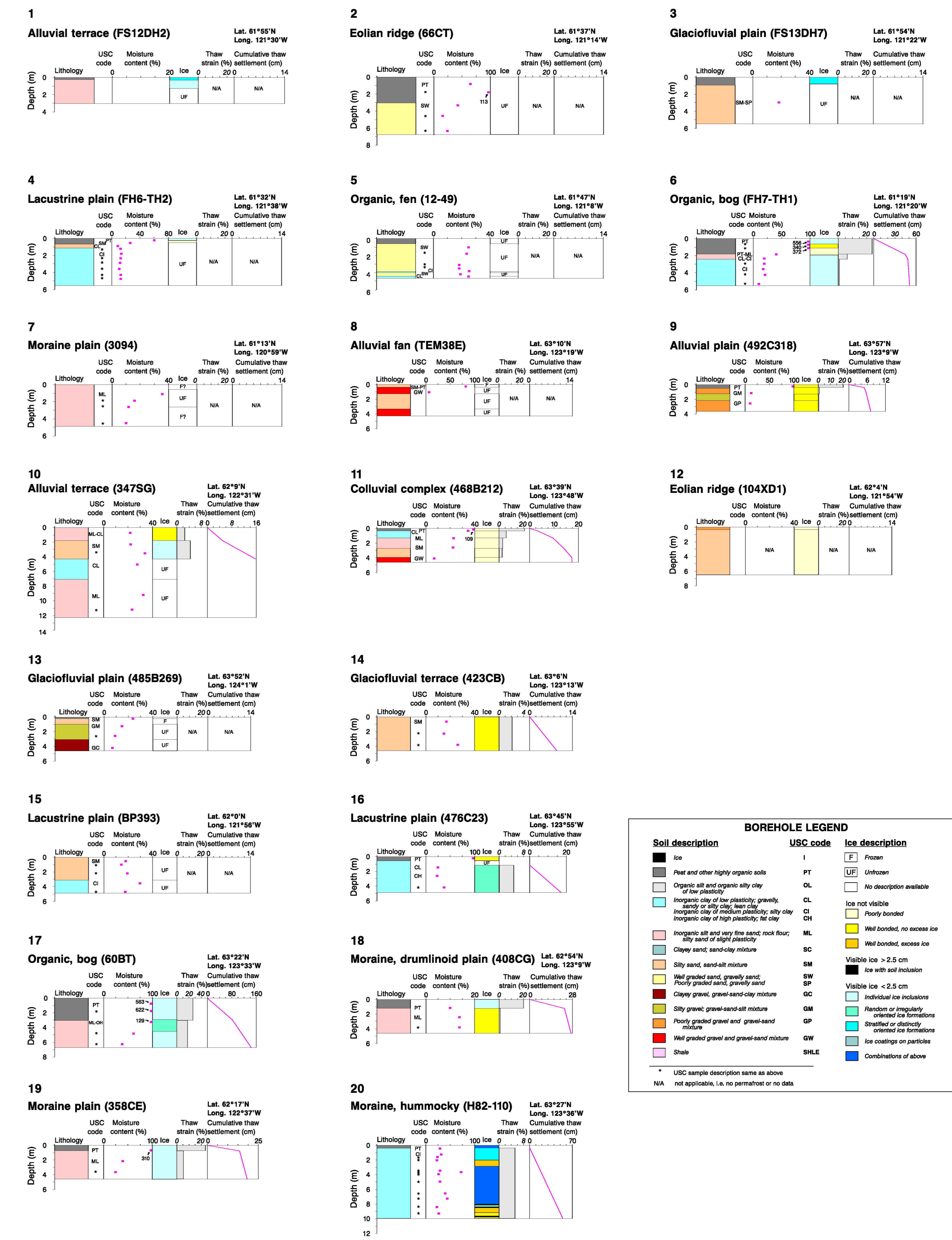


LEGEND

Note: This legend is common to figures 1a and 1b. Not all geological units appear on this map sheet.

Description of deposit	Drainage conditions	Permafrost conditions (ice content as % by volume)
ORGANIC DEPOSITS: peat and muck Fundamental peatland: woody sedge peat, 2-4 m thick; occurring as flat to very gently inclined plains, commonly features, may contain reliculate network of low (50 cm) ridges Bog-dominant peatland: sphagnum peat generally underlain by sedge and woody sedge peat, commonly 1.5-3 m thick, may be 7 m thick in south; occurring as flat or very gently inclined plains, usually raised about 1 m above surrounding ferns, or as peat filling slight depressions in the landscape, typically with numerous shallow, steep-sided, thermokarst depressions	Drainage mainly by subsurface seepage. Water table at surface during summer months; occasional small pools Poorly drained through poorly defined seepage channels, numerous small pools	Generally unfrozen, some relic permafrost may occur at depths exceeding 3 m to south and 2 m to north. Channel fans and small fans within bog complexes may be underlain by permafrost at depths exceeding 0.5 m in north Commonly frozen 0.3-0.5 m below the surface; peat in wet depressions may be unfrozen to depths of >1 m; commonly up to 20%, locally up to 50%, segregated ice within peat and underlying sediment; 30-100 cm, locally up to 3 m, of segregated ice common at minimal soil-peat contact
MARINE DEPOSITS: sand, gravel, silt, clay, and minor peat and organic sediment; deposited at or near present sea level Marine nearshore deposits: sand, gravel, silt, clay, and minor peat and organic sediment, 1-6 m thick, occurring as beaches, spits, bars, and intertidal plains and salt marshes	Poorly to moderately well drained except on ridges	Irregular distribution of permafrost, generally low to medium ice content
ALLUVIAL DEPOSITS: sand, silt, clay, minor gravel, and minor organic sediments in association with modern drainage regime Alluvial plain: coarse sand and gravel with minor silt, fine sand, and clayey silt, commonly organic; 2 m to over 5 m thick, occurring as channel and overbank floodplain sediments, includes deltas, and may incorporate small areas of glaciolacustrine sediment. The Mackenzie Delta unit consists of silt, fine sand, and clayey silt, underlain by coarse sand and gravel in some areas, commonly organic, 10-30 m thick, occurring as flat surfaces marked by numerous distributaries, islands, lakes, and marshes	Poorly to moderately well drained Mackenzie Delta is poorly drained and subject to flooding by sea or river water	Permafrost lacking in unvegetated part of floodplain; many irregularly shaped taliks in Mackenzie Delta, where frozen, pore ice only in coarse sediments, 20-50% segregated ice by volume in fine sediment, ice content decreases with depth, polygonal ice wedges common
Alluvial terrace: sand and silt, in many places underlain by gravel, occurring as terraces, 2-5 m thick Alluvial fans and aprons: silt, sand, and gravel, locally with discontinuous layers of woody peat, deposit is generally coarser textured in upper Mackenzie area than in central and lower Mackenzie area, occurring as individual fans or fan aprons, 5 m to over 30 m thick	Poorly to moderately well drained Moderately well to imperfectly drained	Low ice content in sand and gravel, medium ice content in fine-textured sediment Ice content probably medium to high
COLLUVIAL DEPOSITS: disintegrated and rubble derived from bedrock and surficial materials by a variety of colluvial and sheetwash processes Colluvium: disintegrated or rubble, occurring as blanket or continuous to discontinuous veneer draping underlying bedrock or surficial sediments, generally <5 m thick; in mountainous underlying material is commonly bedrock; unit includes small landfills and small areas of alluvial or glaciolacustrine fans and deltas Landslide deposits: rubble and/or disintegrated occurring as stepped or fan-shaped deposit; commonly occurring as rotational slides in bedrock or in glaciolacustrine sediments overlain by sand and gravel, and as retrogressive flow slides in glaciolacustrine silt and clay or other fine-grained sediments; generally greater than 5 m thick	Poorly to well drained Poorly to moderately well drained	Ice content highly variable, depending on texture and thickness of deposit; where unit overlies impermeable bedrock, high ice contents are likely Permafrost conditions variable; where frozen, ice content highly variable depending on texture of deposit; failure may have been induced by the thawing of ground ice
EOLIAN DEPOSITS: sand with minor silt, sediment derived from glaciolacustrine or sandy lacustrine deposits Eolian ridges: sand with minor silt, 1-4 m thick, occurring as parabolic or blowout dunes on sandy glaciolacustrine, lacustrine, or alluvial deposits, less commonly occurs as sand blanket or veneer	Variable drainage	Low ice content where frozen
GLACIAL LACUSTRINE AND LACUSTRINE DEPOSITS: silt, sand and clay, in many places overlain by discontinuous veneer of organic deposits and locally overlain by sand; sediments laid down in glacial lakes which temporarily occupied the Mackenzie and other valleys at the end of the ice age or, in the far north of the map area, in thermokarst lakes formed and infilled during the Holocene Lacustrine plain: fine-grained sediment: silt, clay, and minor sand, occurring as a flat to gently sloping plain, 1.5-15 m or more thick; locally may occur as veneer <2 m thick, or as moderately sloping plain or broad hummocks or low hills, 2-25 m thick; locally may contain low beach ridges of sand and gravel; locally overlain by peatlands Lacustrine plain, coarse-grained sediment: sand, local gravel, commonly underlain by fine-grained lacustrine sediments; occurring as raised deltas, flat to gently sloping sheet sands, spits, bars, and beaches, includes complexes where fine-grained lacustrine deposits are overlain by up to 3 m of glaciolacustrine sand; 1.5-15 m or more thick; locally overlain by peatlands Lacustrine veneer: silt and sand, generally <1.5 m thick, discontinuously overlies moraine sediments; only mapped south of latitude 64°	Poorly drained except where overlain by peat Moderately well drained except where overlain by peatland Poorly to moderately well drained	Commonly 10-25% segregated ice as thin, irregular, discontinuous seams in upper 1-3 m; segregated ice as reliculate network to 50%, or thick tabular bodies of nearly pure ice at greater depth, growth of massive ice bodies forms pingos in drained thermokarst lake basins in far north, subject to thermokarst processes; active layer detachment slices and retrogressive thaw-flow slides are common on slopes in this deposit Low to medium ice content, higher content in underlying fine-grained lacustrine sediments Ice content low to medium in sand, medium to high in fine-grained sediments
GLACIOFLUVIAL DEPOSITS: sand and gravel locally with a veneer of eolian silt or sand; deposited as proglacial or ice-contact sediments by glacial meltwater Outwash plains and terraces: sand and gravel with silt and peat in some channels; occurring as flat to gently sloping plain or erosional terraces, locally may be rolling to hummocky surfaces modified by thermokarst, 2-30 m thick Ice contact deposits: gravel and sand with minor silt or disintegrated, occurring as hummocks or ridges or as complexes of hummocks, ridges, and/or kettled or thermokarst-modified glaciolacustrine plains and terraces; 2-30 m thick, local relief up to 25 m	Drainage mainly subsurface, generally well drained except in intervening depressions	Low ice content, north of latitude 65° massive ice may be present in underlying sediment at depths of 5-70 m Very low ice content
GLACIAL DEPOSITS: till (nonstratified silt, sand, and clay with some coarser clasts); deposited by glacier ice and occurring as a variety of landforms; locally includes minor scattered glaciolacustrine gravel and sand deposits Moraine plain: till occurring as flat to gently sloping plain, in places moderately sloping, 2-20 m thick Moraine blanket: till occurring as gently to moderately sloping plain controlled by bedrock, 2-6 m thick Moraine veneer: till occurring as veneer overlying bedrock topography, <2 m thick; unit includes minor colluvial deposits; north of latitude 66° moraine veneer commonly overlies sandy or silty clay marine deltas; sequence and, in places, proglacial outwash Drumlinoid plain: all plain with individual drumlins or extensively fluted, 2-30 m thick Hummocky, ridged, or rolling moraine: generally coarse till (70-80% pebble size) throughout most of the map area and clayey till in the north, up to 60 m thick, consisting of individual or coalescent hummocks (5-60 m relief), and/or individual to compound, straight to sinuous ridges (5-60 m relief), and/or till with 5-20% pebble size in broad hummocks or low hills (10-20 m relief)	Poorly to moderately well drained Poorly to moderately well drained Ridges well drained, intervening depressions may be poorly drained Elevated areas moderately to well drained, intervening depressions may be poorly drained	Commonly 10-25% segregated ice as thin, irregular, discontinuous seams Commonly 10-25% segregated ice as thin, irregular, discontinuous seams Commonly 10-25% segregated ice as thin, irregular, discontinuous seams, thicker (10 cm to 3+ m) ice lenses at depth Ice content probably low in hummocky and ridged moraine; in rolling moraine commonly 10-25% segregated ice as thin, irregular, discontinuous seams in upper 2-3 m, and irregularly distributed large masses of segregated ice common at greater depth
BEDROCK Shale, sandstone, and limestone generally occurring as prominent ridges, escarpments and hills; surfaces generally weathered or obscured by colluvium		



BOREHOLE LEGEND

Soil description	USCS code	Ice description
Ice	I	F Frozen
Peat and other highly organic soils	PT	UF Unfrozen
Organic silt and organic silty clay of low plasticity	OL	No description available
Organic clay of low plasticity, gravely	CL	Ice not visible
Inorganic clay of medium plasticity, silty clay	CI	Poorly bonded
Inorganic clay of high plasticity, fat clay	CH	Well bonded, no access ice
Inorganic silt and very fine sand, rock flour; silty sand of slight plasticity	ML	Well bonded, access ice
Clayey sand, sand-clay mixture	SC	Visible ice > 2.5 cm
Silty sand, sand-silt mixture	SM	Ice with soil inclusion
Well graded sand, gravelly sand; poorly graded rock, gravelly sand	SW	Visible ice < 2.5 cm
Clayey green, green-sand-clay mixture	GM	Random or irregularly oriented ice inclusions
Silty green, green-sand-silt mixture	GP	Sheffer or distantly oriented ice formations
Poorly graded gravel and gravel-sand mixture	GW	Coarse or distantly oriented ice formations
Well graded gravel and gravel-sand mixture	GW	Ice coatings on particles
Shale	SHLE	Combinations of above

* USCS sample description same as above
N/A Not applicable, i.e. no permafrost or no data.

Figure 1b. Surficial geology, Mackenzie valley and adjacent areas, 60°N-64°N.