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GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA

SUPPLEMENT 2: Surficial Geology of the proposed Thaidene Nene National Park Reserve in the area of the East Arm of Great Slave Lake, Northwest Territories

QUATERNARY

HOLOCENE

NONGLACIAL ENVIRONMENT

O	ORGANIC DEPOSITS: peat and muck up to 2 m thick; formed predominantly by the accumulation of vegetative material in bogs; occurs in depressions, poorly drained areas and along valley bottoms; may contain ice-wedge polygons; small unmapped organic deposits occur in most terrain units.
C	COLLUVIAL DEPOSITS: angular pebbles, cobbles to boulders, massive to stratified, up to 10 m thick; talus deposits formed predominantly from weathering and frost shattering of bedrock along escarpments
E	EOLIAN SEDIMENTS: fine to medium sand, undifferentiated to well-sorted, 1 m to at least 4 m thick; may contain active and stabilized dunes and blow-outs; derived from glaciofluvial deposits.
A	ALLUVIAL SEDIMENTS: silt to gravel size sediment, deposits may be massive to stratified, 1 m to at least 3 m thick, deposited by modern streams and rivers; occurs as floodplains and alluvial fans in braided and meandering rivers.

LAST GLACIATION (WISCONSIN)

PROGLACIAL AND GLACIAL ENVIRONMENT

GLACIOLACUSTRINE SEDIMENTS: silt, sand and gravel; 1 m to at least 5 m thick; deposited in temporary glacier-dammed lakes during deglaciation.

L	Glaciolacustrine blanket and veneer: silt and sand; cross-stratified to planar bedded; 1 to 3 m thick; deposited into temporary glacier-dammed lakes during deglaciation.
D	Glaciolacustrine deltas: sand, gravel, and cobbles, massive to cross-stratified; up to 5 km long; 10 to 20 m thick; associated with temporary glacier-dammed lakes; may exhibit kettle lakes, braided paleochannels, ice-wedge polygons, and beach ridges; may contain massive ground ice.

GLACIOFLUVIAL SEDIMENTS: sand, gravel, cobbles and small boulders, 2 m to at least 30 m thick; deposited in, on, or beneath, or in contact with, glacier ice; may exhibit kettle lakes and ice wedge polygons; may contain massive ground ice.

G2	Outwash: sand and gravel; massive to cross-stratified; less than 3 m to at least 20 m thick; flat-topped to irregular; may occur as subaqueous deposits and subaerial fans and terraces.
G1	Esker sediments: sand, gravel, cobbles and small boulders; in planar, cross-stratified, and massive beds; 1 to at least 30 m thick; forms ridges with both sharp-crested and flat-topped segments up to 20 km long, and 10 to 250 m wide with mounds and flanking fans; associated with kettle lakes, kettle holes, and collapsed terrain; may contain exposed ice-walled channels; may be associated with zones of scoured rock and till veneer, boulder lags, isolated kame deposits, small transverse gravel ridges associated with this unit, and isolated kame deposits.

TILL DEPOSITS: unsorted glacial debris (diamicton), consisting of a silty sand matrix containing pebbles, cobbles, and boulders, angular to rounded clasts, low to high compaction, from less than 1 m to at least 5 m or more thick; deposited beneath, or along the margin of, glaciers as lodgment till and ablation till.

T3	Hummocky till: diamicton; compact; from 3 m to at least 5 m thick; forms irregular to rolling terrain, may contain low morainal ridges up to 10 km long, local relief up to 5 m; some areas have abundant small esker segments.
T2	Till blanket: diamicton; moderately compact; from 2 to 5 m thick; occurs as till plains mimicking bedrock topography and as extensive drumlinoid fields; may contain smaller areas of till veneer; isolated outcrops in this unit are shown by symbols.
T1	Till veneer: diamicton; low compaction; less than 1-2 m thick; occurs as a discontinuous layer where rock structure is generally visible on airphotos, and as a lag on washed bedrock; unit may include small isolated patches of bedrock, glaciofluvial deposits and till blanket.

PRE-QUATERNARY

R	Bedrock: undifferentiated sedimentary, volcanic, plutonic and metamorphic rocks; rock types exhibit a range of weathering, from well-preserved paleoflow features to surfaces which have undergone grussification and chemical dissolution of 2 cm or more; may include patches of till veneer and glaciofluvial sediments; areas of shattered frost heaved rock and meltwater scour are shown by symbols.

Area of meltwater scour

Area of interest
Geological contact
Limit of mapping
Frost heaved and shattered rock
Ice-wedge polygons
Raised beach
Esker (direction of flow known, unknown)
Kame
Drumlinoid ridge
Crag-and-tail
Roche moutonnée
Morainal ridge
Glacial striae (ice flow direction known; 1=oldest, 2=youngest)
Glacial striae (ice flow direction unknown; 1=oldest, 2=youngest)
S-forms
Outcrop
Station/sample site (ground observation)

LOCATION MAP

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

Geology by D. Kerr, with field assistance from R. Knight, D. Sharpe, D. Cummings, P. O'Sullivan, B. Sim, B. Kjarsgaard, D. Wright, S. Bull, D. Enzoe, T. Catholique, and J. Desjarlais

Sources: Surficial geology is based on airphoto interpretation and 520 ground observations

GIS assistance from L. Robertson, H. Russell, and D. Lemkow

To accompany Open File 7196, MERA for the proposed Thaidene Nene National Park Reserve in the area of the East Arm of Great Slave Lake, Northwest Territories
Wright, D.F., Ambrose, E.J., Lemkow, D., and Bonham-Carter, G.F. (Eds.), 2013,
Mineral and Energy Resource Assessment for the proposed Thaidene Nene National Park Reserve in the area of the East Arm of Great Slave Lake, Northwest Territories,
Geological Survey of Canada, Open File 7196, 23 chapters, 4 digital supplements

Scale 1:250 000/Échelle 1/250 000

5 0 5 10 15 20 Kilometres

Universal Transverse Mercator Projection
North American Datum 1983
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Projection transverse universelle de Mercator
Système de référence géodésique nord-américain 1983
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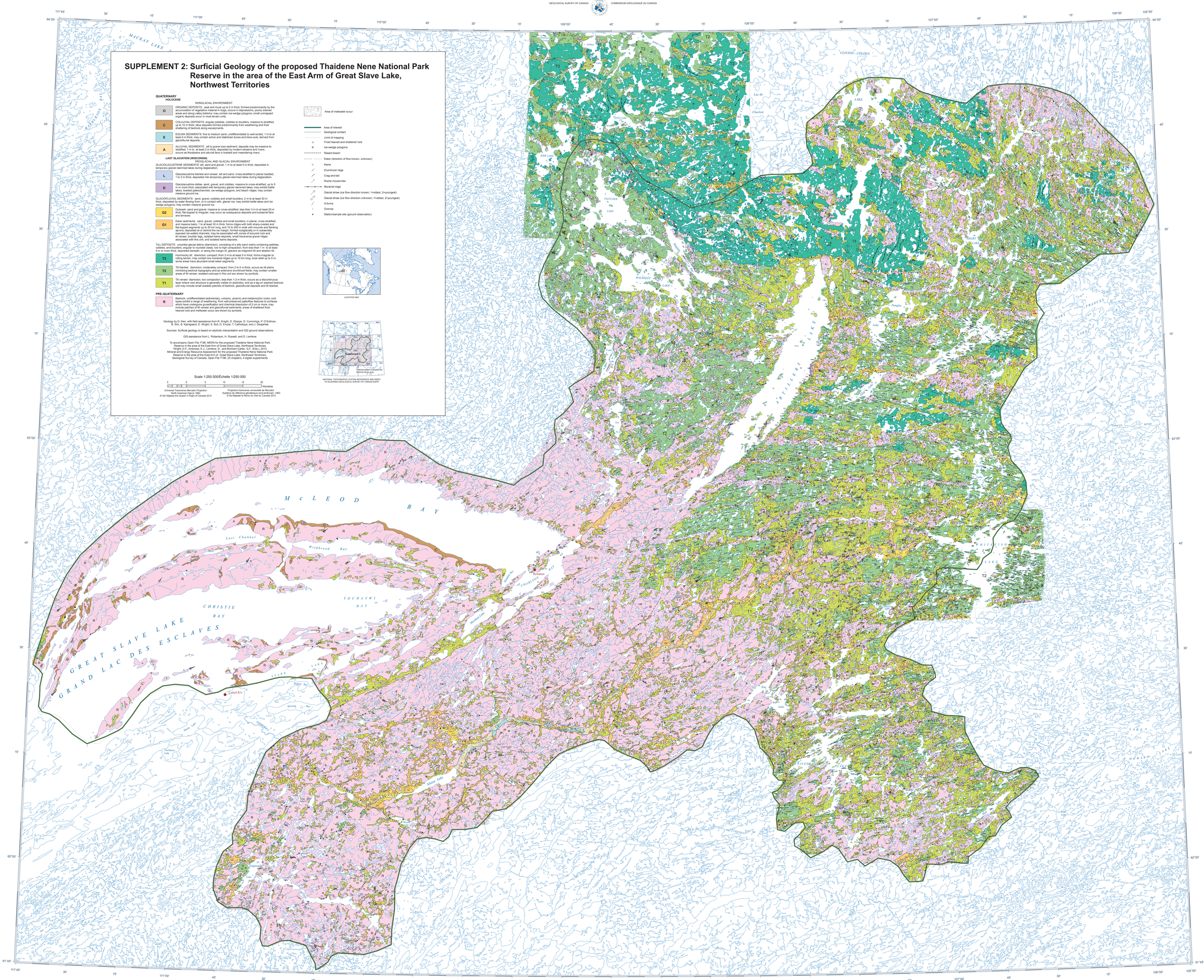

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