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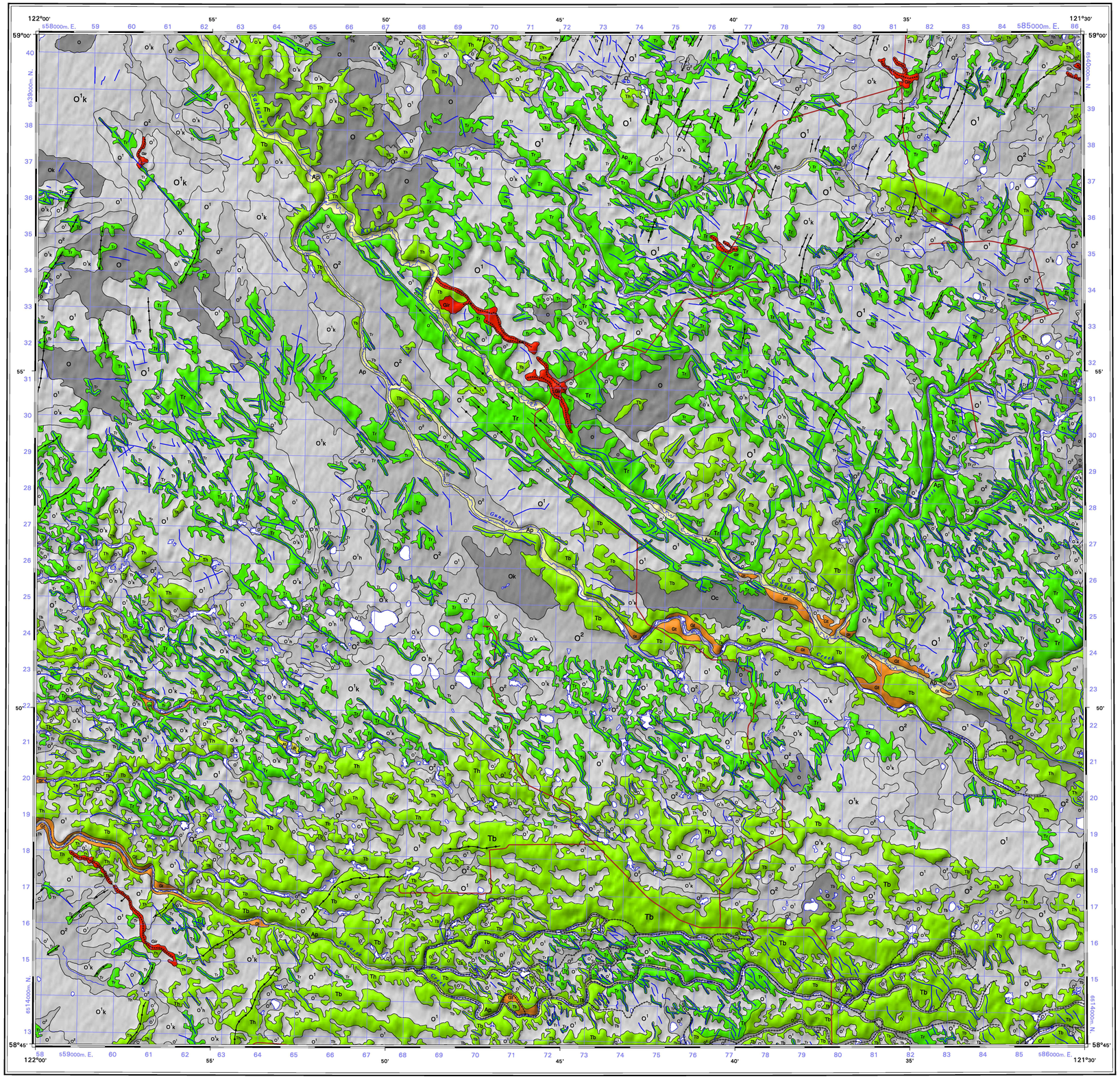
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

BRITISH COLUMBIA



LEGEND

This legend is common to GSC OF4754, OF5070, OF5237, OF5305, OF5306, OF5307, OF5309, OF5527, and OF5540. Coloured legend blocks indicate units that appear on this map.

NOTE: In areas where the surficial cover forms a complex pattern, the area is coloured according to the dominant unit and labelled in descending order of cover (e.g. O-Tr). Where buried aggregate deposits (sand and gravel - commonly associated with Gt or Gd surficial units) are known, or suspected, areas are coloured according to the overlying unit and labelled in the following manner: Lv/Gd.

QUATERNARY
SURFICIAL DEPOSITS
POST LAST GLACIATION

NONGLACIAL ENVIRONMENTS

AN — ***ANTHROPOGENIC DEPOSITS:*** *culturally-made or modified geological materials such that their original physical properties (e.g. structure, cohesion, compaction) have been drastically altered; >2 m thick.*

ORGANIC DEPOSITS: *peat and muck; 1 to 3 m thick on average; formed by the accumulation of plant material in various stages of decomposition; generally occurs as flat, wet terrain (swamps and bogs) over poorly drained substrates.*

O^1 — ***Bog peat:*** *sphagnum or forest peat formed in an ombrotrophic environment; wet terrain; may be treed or treeless; O^1h, hummocky, mounds and plateaus; area may be underlain by ground ice or shallow permafrost conditions; O^1k, thermokarst terrain related to melting ground ice.*

O^2 — ***Fen peat:*** *peat derived from sedges and partially decayed shrubs in a eutrophic environment; forms relatively open peatlands with a mineral-rich water table that persists seasonally near the surface; generally covered with low shrubs and an occasional sparse layer of trees.*

O — ***Undifferentiated bog and fen deposits:*** *Oh, undifferentiated hummocky bog and fen deposits; area may be underlain by ground ice or shallow permafrost conditions; Ok, undifferentiated bog and fen deposits with thermokarst terrain related to melting of ground ice; Oc, undifferentiated bog and fen deposits cut by numerous subparallel channels on gentle slopes.*

COLLUVIAL DEPOSITS: *mass wasting debris; poorly sorted, massive to stratified debris deposited by direct, gravity-induced movement; composition dependant on source material.*

Ch — ***Landslide and slump debris:*** *active and inactive landslides; hummocky topography; diamicton, generally 1 to 10 m thick, but may exceed 10 m near the toe of large landslides.*

Cv — ***Colluvial veneer:*** *thin and discontinuous cover of slumped and/or soliflucted material <1 m thick; overlies bedrock or till.*

C — *Undifferentiated colluvial deposits.*

ALLUVIAL DEPOSITS: *sorted gravel, sand, minor silt, and organic detritus deposited by streams; commonly stratified.*

Ap — ***Floodplain deposits:*** *sorted gravel, sand, silt, and organic detritus >1 m thick; forming active floodplains close to river level with meander channels and scroll marks.*

At — ***Fluvial terrace deposits:*** *inactive terraces above modern floodplain; >2 m thick; represents a potential aggregate source.*

Ad — ***Deltaic sediments:*** *stratified sand and gravel underlain by silt and clay; generally 2 to 15 m thick; occuring at the mouths of streams entering lakes.*

Af — ***Alluvial fan deposits:*** *poorly sorted gravel, sand, and organic detritus >1 m thick.*

Av — ***Alluvium veneer:*** *< 1 m thick; primarily as uniform sheets of slope wash on gentle slopes.*

A — *Undifferentiated fluvial deposits.*

L^1 — ***LACUSTRINE DEPOSITS:*** *sand, silt, and minor clay deposited in a former lake; >1 m thick; generally overlain by organic deposits; exposed by recent fluctuations in lake levels.*

NONGLACIAL AND PROGLACIAL ENVIRONMENTS

EOLIAN DEPOSITS: *wind-deposited medium to fine sand; derived from deltaic or glaciolacustrine deposits; in some areas eolian sediments are thin or absent between dunes.*

Er — ***Ridged eolian deposits:*** *forming dunes; generally >2m thick.*

Ev — ***Eolian veneer:*** *discontinuous veneer of eolian sediments; <1 m thick.*

POSTGLACIAL OR LATE WISCONSINAN

PROGLACIAL AND GLACIAL ENVIRONMENTS

GLACIOLACUSTRINE DEPOSITS: *fine sand, silt, and clay, with minor debris-flow diamicton, deposited in glacier-dammed lakes in valleys and along the margin of the retreating Laurentide Ice Sheet; usually overlain by organic deposits in lowlands.*

Lb — ***Glaciolacustrine blanket:*** *>1 m thick.*

Lv — ***Glaciolacustrine veneer:*** *thin and discontinuous; <1 m thick.*

GLACIOFLUVIAL DEPOSITS: *well to poorly stratified sand and gravel; minor diamicton; deposited behind, at or in front of the ice margin by glacial meltwater; represents a potential aggregate source.*

G — ***Proglacial outwash:*** *cross-stratified gravel and sand deposited in front of the ice margin; Gp, outwash plain deposits, generally 1 to 5 m thick, generally mantle valley floors and surfaces adjacent to glacial meltwater channel margins; Gt, outwash terrace deposits, generally associated with meltwater channels and canyons; 1 to 10 m thick; Gd, glaciofluvial delta deposits; 1 to >30 m thick; Gf, glaciofluvial fan deposits; 1 to 10 m thick.*

Gi — ***Ice-contact stratified drift:*** *poorly-sorted sand and gravel with minor diamictons; deposited in contact with the retreating glacier; 1 to >20 m thick; Gih, hummocky topography relating to melting of underlying ice; Gik, surface marked by kettle holes; Gir, esker ridges; Git, karne terraces; Gid, ice-contact glaciofluvial delta deposits; 1 to >30 m thick, surface marked by kettles.*

TILL: *diamicton deposited directly by the Laurentide Ice Sheet; sandy to clayey matrix with striated clasts of various lithologies, including many Canadian Shield, carbonate and sandstone erratics; clast content is typically low (<10 %).*

Tb — ***Till blanket:*** *>1 m thick, continous till cover forming undulating topography that locally obscures underlying units.*

Ts — ***Streamlined and fluted till:*** *>1 m thick, till surface marked by streamlined landforms including flutes and drumlins.*

Th — ***Hummocky till:*** *>1 m thick; hummocky till surface.*

Tr — ***Ridged till deposits:*** *>1 m thick, moraines or crevasse fillings forming a ridged topography.*

Tv — ***Till veneer:*** *<1 m thick, discontinuous till cover, underlying bedrock topography is discernible.*

PRE-QUATERNARY
BEDROCK

R — ***Sedimentary bedrock:*** *Cretaceous Fort St. John Group shales (including the Shaftesbury Formation) and Dunvegan Formation sandstone exposed in highlands and along meltwater channel and canyon walls.*

Geological boundary (defined)

Meltwater channel, small (paleoflow direction known, unknown)

Esker

Major moraine

Minor moraine and crevasse filling

Flutings or drumlinoid ridges parallel to ice flow (direction unknown)

NOTES

The Gunnell Creek (NTS 94-I/13) map area was inundated by the Laurentide Ice Sheet during the late Wisconsinan glaciation (ca. 25 000–10 000 years ago). A thick blanket of clay and silt-rich till was deposited by westward flowing ice across the region. Observations of large shear structures in till (some demarcated by intra-till winnowed sand and gravel lenses and larger bodies), and prevalent clast pavements (including three distinct clast pavements in a single 10 m vertical section) suggest till in this area underwent extensive deformation, thrusting, and stacking. This likely accounts for the considerable thicknesses of till (> 3–10 m) seen here and elsewhere in the region.

During deglaciation, the eastward retreat of ice appears to have undergone increasing degrees of topographic constraint. A regional full-glacial flow path curving west-northwest around the Etsho Plateau (to the north) and down the axis of the Sahtaneh River, eventually separated into two lobes. The point of divergence appears to have been a bedrock high situated ~ 20 km east of the map area. Ice in the northeastern quadrant of the map retreated first, and in an eastward fashion. The second lobe of ice which occupied much of the central and southern half of the map area, became increasingly lobate, and retreated in an east-northeast direction. Thick till deposits (units Tb and Th) and prominent ice-marginal meltwater channels recorded in the southern areas of the map are associated with the retreat of this latter ice lobe.

A prominent esker lies in the central part of the map area, paralleling the Sahtaneh River. At its proximal (eastern) end, it is up to 7 m thick, declining to 2–4 m along the rest of its ~ 6 km length. The esker is bisected by the South Gunnell Road, where it has been exploited as a source of gravel in support of road construction. Other smaller eskers situated north of here are predominantly composed of sand, offering little in the way of granular aggregate potential. An esker identified from air photographs in the southwestern corner of the map area has yet to be verified or its granular aggregate potential assessed by ground reconnaissance. Glaciofluvial terraces situated along Gunnell Creek and Sahtaneh River may also represent potential granular aggregate resources. Terraces situated on either side of the road crossing on Gunnell Creek are predominantly coarse sand deposits, however, the granular aggregate potential of other terraces in the map area remains to be assessed.

Extensive crevasse-squeeze ridges and the hummocky character of till deposits in the map area are accentuated by bog and fen deposits that infill much of this flat to gently rolling terrain. Unique, long, linear (1–3 m high, 10–40 m wide), generally flat-topped ridges situated in the central part of the map area, paralleling the Sahtaneh River, are considered to be the product of longitudinal shearing in the ice and squeezing of till during full-glacial time. This may mark the separation of more dynamic ice flowing west-northwest around the Etsho Plateau from a more passive regional ice cover, akin to shear moraines and similar deposits associated with ice streams. Given their topographic expression and linear extent, these ridges make ideal corridors for road development.

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Geology by I.R. Smith, 2003–2005

Geological compilation by I.R. Smith, 2003–2006

Digital compilation by L. Robertson, GSC Northern Canada Division, 2006

Digital cartography by E. Everett, Data Dissemination Division (DDD)

This map was produced from processes that conform to the Scientific and Technical Publishing Services Subdivision (DDD) Quality Management System, registered to the ISO 9001: 2000 standard

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

Digital base map provided by I.R. Smith, modified by DDD

Shaded relief image prepared by DDD, derived from the digital elevation model supplied by I.R. Smith, based on 3rd arc. second SRTM imagery Illumination: azimuth 310°, altitude 25°, vertical factor 4.8x

Mean magnetic declination 2009, 21°17'E, decreasing 22.4' annually

LOCATION MAP

GSC OPEN FILE 5305
BCMEMPR MAP 2006-3

SURFICIAL GEOLOGY

GUNNELL CREEK

BRITISH COLUMBIA

Scale 1:50 000/Échelle 1/50 000

kilometres 1 0 1 2 3 4 kilomètres

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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94-O/1	94 P/4	94 P/3
94 J/16	94-I/13 OF5305	94-I/14 OF5309
95 J/9	94-I/12 OF5306	94-I/11 OF5307

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2009

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Recommended citation:
Smith, I.R.
2009: Surficial geology, Gunnell Creek, British Columbia; Geological Survey of Canada, Open File 5305; British Columbia Ministry of Energy, Mines and Petroleum Resources, Map 2006-3, scale 1:50 000.

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