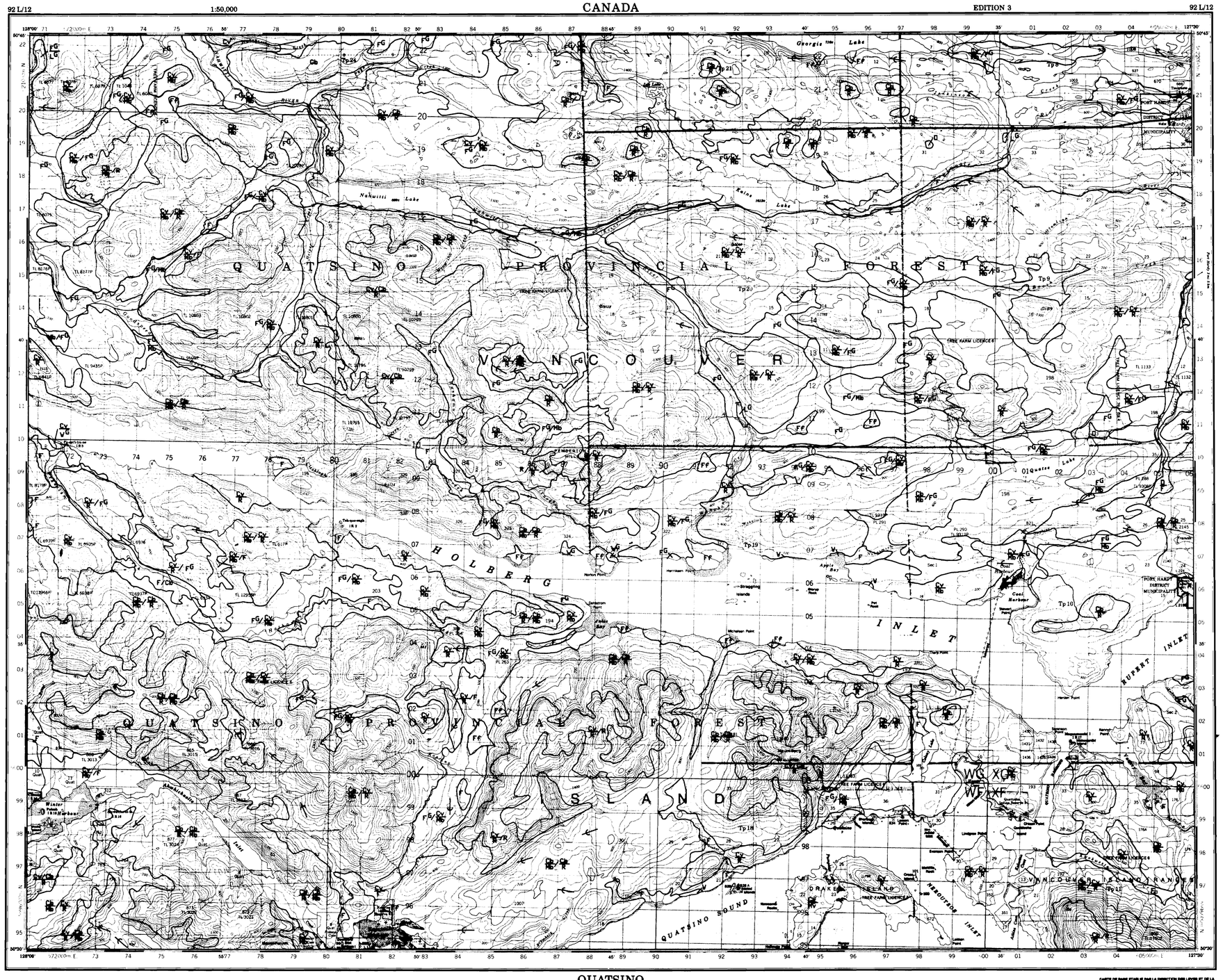
92 L/12 1:50,000 CANADA EDITION 3 92 L/12



BASE MAP PRODUCED BY THE SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA. UPDATED FROM AERIAL PHOTOGRAPHS TAKEN IN 1978. PROVED BY THE SURVEYS AND MAPPING BRANCH, DEPARTMENT OF LANDS, FORESTS AND WATER RESOURCES, BRITISH COLUMBIA. CULTURE CHECK 1979. INFORMATION CURRENT AS OF 1979.

Roads — Routes
hard surface, all weather ..... pavée, toute saison ..... [illegible] km
hard surface, all weather ..... pavée, toute saison ..... 2 lanes / voies — less than 4 m / moins de 4 mètres; 4 m and more / 4 m et plus
loose or stabilized surface, all weather ..... gravier aggloméré, toute saison ..... 2 lanes / voies — less than 4 m / moins de 4 mètres; 4 m and more / 4 m et plus
loose surface, dry weather and uncontrolled streams ..... de gravier, temps sec et rivières hors classe ..... 1 lane / voie
cart track ..... de terre ..... —
trail, cut line or portage ..... sentier, percée ou portage ..... —

FOR COMPLETE REFERENCE SEE REVERSE SIDE — POUR UNE LISTE COMPLÈTE DES SIGNES, VOIR AU VERSO

QUATSINO
RUPERT LAND DISTRICT
BRITISH COLUMBIA
Scale 1:50,000 Échelle

Miles 1 0 1 2 Miles
Metres 1000 0 1000 2000 3000 4000 Metres
Yards 1000 0 1000 2000 3000 4000 Yards

CONTOUR INTERVAL 100 FEET
Directions to Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

EQUIDISTANCE DES COURBES 100 PIEDS
Élévations en pieds au-dessus du niveau moyen de la mer
Système de référence planétaire nord-américain 1927
Projection transverse de Mercator

CARTE DE BASE ÉTABLIE PAR LA DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA. MISE À JOUR À L'AIDE DE PHOTOGRAPHIES AÉRIENNES PRISES EN 1978. PROUVÉE PAR LA DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DES TERRES, DES FORÊTS ET DES RESSOURCES HYDRAULIQUES DE LA COLOMBIE-BRITANNIQUE. VÉRIFICATION DES CULTURES EN 1979. RENSEIGNEMENTS À JOUR EN 1979.

Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources

Geological Survey Branch

OPEN FILE 1992-6

SURFICIAL GEOLOGY OF THE QUATSINO AREA

NTS 92L/12

Geology by Daniel E. Kerr

1:50 000

For an overview of the surficial geology of the Quatsino area please refer to the report entitled "Preliminary Results of Drift Exploration Studies in the Quatsino (92L/12) and Mount Milligan (93N/1E, 93I/4W) Areas" by D. E. Kerr and S. J. Sibbick *in* Geological Fieldwork 1991, *B. C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1992-1. Geology based on air photo interpretation followed by ground-truthing. Fieldwork completed in 1991.

MAP UNIT LETTER NOTATION

SIMPLE TERRAIN UNIT SYSTEM

surficial material / texture — gH — surface expression

COMPOSITE UNITS

Cv/Mb — The earthcomponent (Cv) above the symbol stratigraphically overlies the one below (Mb)

Mb/Fl — The earthcomponent (Mb) in front of the symbol is more extensive than the one that follows (Fl)

SURFACE EXPRESSION

b	blanket (< 1 metre)
f	fan
h	hummocky
t	terraced
v	veneer (< 1 metre)

TEXTURES

c	clay
$	silt
s	sand
g	gravel
b	boulder
d	diamicton

SURFICIAL MATERIALS

A	anthropogenic	Man-made or man-modified materials.
C	colluvial	Deposition with variable structure and texture; includes talus, avalanche, landslide, debris flow and other mass wastage products and weathered bedrock.
E	eolian	Fine sand and silt transported by wind; includes dune and loess deposits.
F	fluvial	Gravel, sand or silt deposited by streams and rivers; includes floodplain, river bar/terrace, delta and alluvial fan sediments.
gG	glaciofluvial	Fluvial sediment deposited in association with glacier ice; generally consists of gravel and sand; includes kettled outwash, kame terraces and eskers.
I	ice	Permanent snow and ice; glaciers and icefields.
L	lacustrine	Sediment deposited in lakes or around lake shorelines; generally consists of sand, silt and clay; includes beach and lacustrine terrace deposits.
LG	glaciolacustrine	Lacustrine sediment deposited in association with glacier ice; similar to lacustrine deposits but displays features such as dropstones, ice-rafted stones and kettles.
M	morainal	Deposition (till) deposited directly by glaciers; generally consists of well-compacted material with variable structure and texture; includes moraine, till plain and drumlin features.
O	organic	Material resulting from the accumulation and decay of vegetative matter; generally consists of peat; includes bogs, swamps and marshes.
R	bedrock	Outcrops and rock covered by less than 10 cm of unconsolidated material.
U	undifferentiated	Material of variable texture and origin.
V	volcanic	Unconsolidated pyroclastic sediments including volcanic ash, lapilli and volcanic debris.
W	marine	Sediment deposited in marine waters or along coastlines; generally consists of clay, silt, sand or gravel; includes beaches and deeper water deposits.
gG	glaciomarine	Sediment deposited in a marine environment in close proximity to glacier ice; generally poorly sorted and stratified or massive; includes glaciomarine deltas and deeper water deposits.

ON-SITE SYMBOLS

Drumlin, crag and tail	
Striae, grooves (ice flow direction known; unknown)	
Flutings	
Moraine ridge (major, minor)	
Esker (flow direction known; unknown)	
Meltwater channel (major, minor)	
Escarpment	
Cirques	
Glacier flow	
Erratics	
Landslide (headwall scar)	

QUATERNARY GEOLOGY NOTES

The Quatsino map area was last glaciated during the Late Wisconsinan (Fraser glaciation) between 20 800 ± 330 years B.P. (GSC-2506) and 12 200 ± 160 years B.P. (GSC-24). Howes (1983) reported evidence for two glaciations based on the presence of two distinct tills in the north-central regions of Vancouver Island. However, mapping during 1991 provided evidence for only one glaciation within the study area. Directional ice-flow indicators (striae, grooves, crag and tail features) suggest that the regional ice direction during the last glaciation was generally toward the northwest, probably originating from the Coast Mountains and crossing Queen Charlotte Strait. Fluted morainal landforms south of the Pemberton Hills parallel the glacial trend to the northwest. There is, however, considerable variation in glacier flow direction on a local scale, notably south of Holberg Inlet. During the early stages of the glacial advance, individual tongues of ice followed preexisting valleys, some ice lobes flowing to the west (east of Koprino Harbour), southwest (east of Winter Harbour) and south (Koprino River valley). There is no evidence for any local ice sources in the Quatsino area.

Field mapping shows that glaciomarine (W^{GG}) and marine (W) sediments along the coastal lowlands of Holberg and Rupert Inlets and Quatsino Sound are virtually non-existent or modified beyond recognition below the estimated marine limit of 30 metres elevation. Widespread deposits of till (M_{tb}, M_{tv}), generally locally derived, are common in both highlands and lowlands, and may attain tens of metres in thickness in certain valleys such as the Goodspeed, Cleskiagh and the southernmost eastern and western tributaries of the Koprino River. Average till thickness, however, varies from 1 to 4 metres. Glaciofluvial outwash (F^{GG}) consisting of sand and gravel 1 to 15 metres thick, is generally restricted to many valley bottoms including the Koprino River, Hathaway Creek, Nahwitti River and Hushamu Creek. Isolated pockets of silty clay glaciolacustrine (L^{GG}) sediments occur in valleys (Tauiquass River and Wanokana Creek) where glacial meltwaters were once ponded by stagnant lobes of ice. Colluvium derived from till and weathered bedrock is found not only on steeper slopes, but as a ubiquitous veneer (Cv) (less than 1 metre) or blanket (Cb) (greater than 1 metre) which covers most other types of surficial sediment.

Howes, D. (1983): Late Quaternary Sediments and Geomorphic History of Northern Vancouver Island, British Columbia; *Canadian Journal of Earth Sciences*, Volume 20, pages 57-65.

LOCATION OF GROUND INVESTIGATION SITES