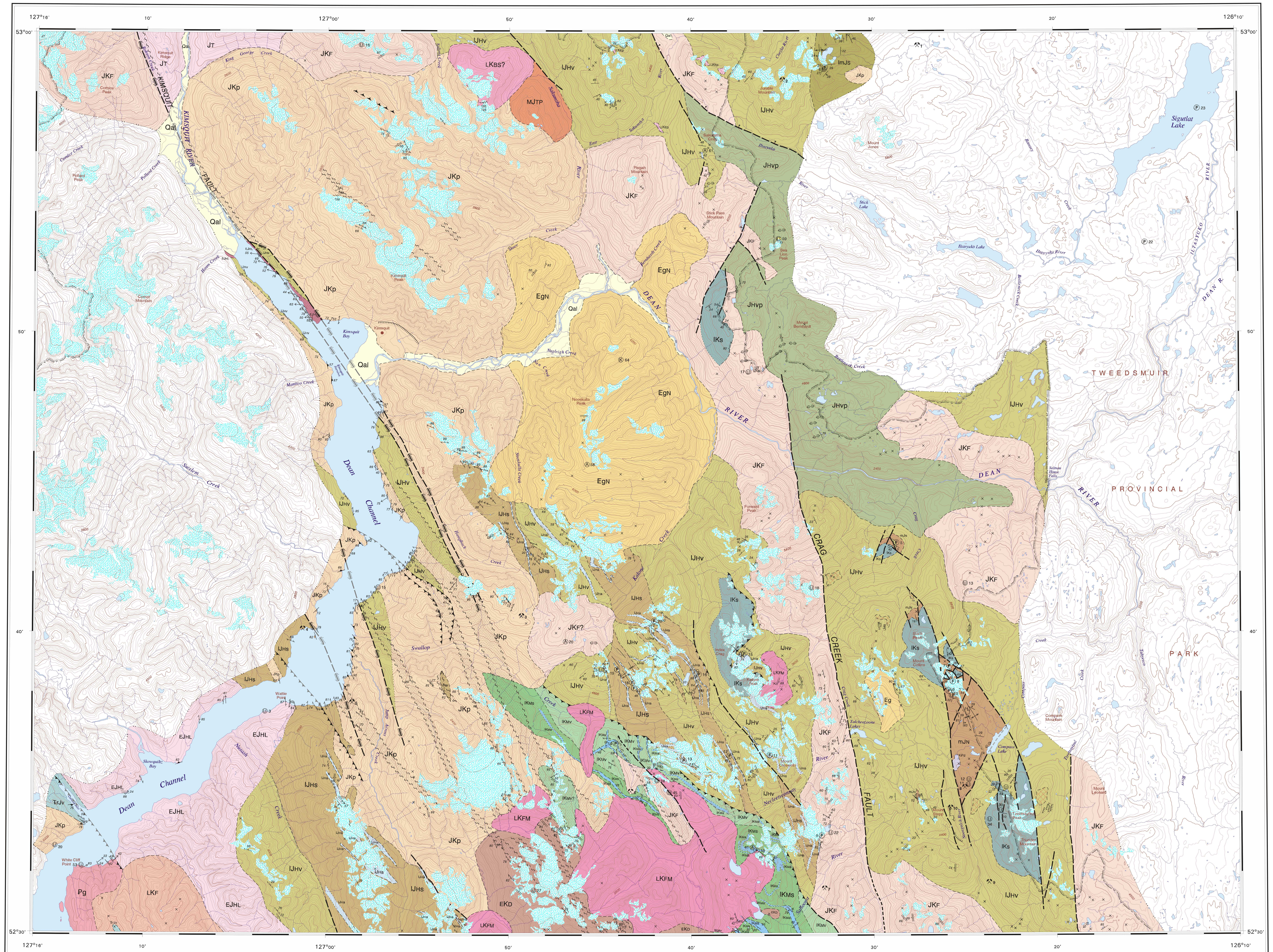
Natural Resources Canada / Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA

British Columbia — Ministry of Energy, Mines and Petroleum Resources



Canada

GSC OPEN FILE 5385

GEOLOGY

BELLA COOLA REGION
(93D/01, /07, /08, /10, /15 AND PARTS OF 93D/02, /03, /06, /09, /11, /14, /16 AND 92M/15 AND /16)

BRITISH COLUMBIA

Scale 1:100 000/Échelle 1/100 000

kilometres 2 0 2 4 6 8 kilomètres

Universal Transverse Mercator Projection
North American Datum 1983

Projection transverse universelle de Mercator
Système de référence géodésique nord-américain, 1983

Geology by L.J. Diakow (2001-2003), J.B. Mahoney (2001-2005), S.M. Gordee (2001-2004), L.C. Struik (2000-2001), J.W. Haggart (2001-2005), G.J Woodsworth (2001-2004), M. Rusmore (2004), P. van der Heyden (1989, 1990) and M.G. Hrudey (2001)

Geological compilation by J.W. Haggart, J.B. Mahoney, G.J. Woodsworth, L.J. Diakow, S.M. Gordee and M. Rusmore

This map supercedes Geological Survey of Canada Open File 1463, 4018 and 4639, and British Columbia Geological Survey Branch Open File 2004-13

Digital cartography by M. Ceh (2005-2006), N.L. Hastings (2002-2005), and J. Joseph (2003), Geological Survey of Canada

Contribution of Bella Coola Targeted Geoscience Initiative, Cordilleran Energy and Minerals Project Number Y15

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

Digital base map from data compiled by Geomatics Canada modified by Geological Survey of Canada

Mean magnetic declination 2006, 20° 18´ E, decreasing 15.0´ annually. Readings vary from 20° 29´ E in the northwest to 20° 06´ E in the southeast corner of the map

Elevations in metres above mean sea level

Contour interval 200 feet

Sheet 1

93 E/04	93 E/03	93 E/02	93 E/01	93 F/04
93 D/13	93 D/14	93 D/15	93 D/16	93 C/13
93 D/12	93 D/11	93 D/10	93 D/09	93 C/12
93 D/05	93 D/06	93 D/07	93 D/08	93 C/05

OF5385_1
OF5385_2

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

LEGEND

Coloured boxes indicate units that appear on this map

STRATIFIED ROCKS

QUATERNARY

Qal — *Alluvium, colluvium, till*

PALEOGENE
EOCENE
OOTSA LAKE GROUP (U/Pb ca. 53 Ma)

Er — *Megacrystic potassium feldspar-quartz-biotite-phyric flow dome(?) and as pyroclasts admixed with basalt and andesite lava fragments in crudely layered tuff breccia; small solitary exposure north of Sea Lion Peak*

LOWER CRETACEOUS
ALBIAN
OBSTREPEROUS RIDGE SEDIMENTARY UNIT

lKO — *Silty shale and mudstone, siltstone, minor fine-grained sandstone, commonly fossiliferous; locally with grit to pebble conglomerate at the base; equivalent to Taylor Creek Group and Skeena Group, in part*

APTIAN-ALBIAN
SALLOOMT ASSEMBLAGE (U/Pb ca. 110-112 Ma minimum)

lKs — *Volcanic rocks predominate in lower parts of sections; basalt and lesser andesite lava flows with interflow breccia; amygdaloidal and plagioclase-phyric lavas containing pyroxene and scarce hornblende phenocrysts; thick sections form cliffs with a stepped, diffusely bedded appearance; local welded rhyolite ash-flow tuff near the top of the subaerial succession at Tzeetsaytzul Peak changes laterally to submarine volcanic facies in the section north of Salloomt Peak where thick hyaloclastite and amygdaloidal flows pass upward into a mixed volcanic-sedimentary section dominated by fine- to coarse-grained, cross-stratified calcareous feldspathic sandstone and pebble conglomerate containing significant felsic volcanic detritus, and black siltstone to mudstone with minor interspersed welded ignimbrite, lapilli tuff and tuff breccia; rare grey-black laminated limestone locally, irregularly interlayered with basalt flows; the unconformable lower contact with older layered rocks and Jurassic and Cretaceous plutons is marked locally by a granitoid cobble to boulder conglomerate or a red oxidized conglomerate-sandstone sequence dominated by fine-grained andesite porphyry cobbles and boulders*

?VALANGINIAN, HAUTERIVIAN-BARREMIAN
MONARCH ASSEMBLAGE

lKMv — *Dominantly volcanic rocks; olive green amygdaloidal basaltic andesite and basalt with rare columnar jointing, forming massive step-like cliffs; associated andesitic breccia and tuff breccia; locally intercalated with thinly bedded siltstone, black argillite to slate and pebble conglomerate; complexly interfingered with lKMs; unconformably overlies lithologically similar rocks of probable Jurassic age and Jurassic and Cretaceous plutons*

lKMs — *Dominantly sedimentary rocks including feldspathic sandstone and siltstone, black argillite to slate with grit and pebble to cobble conglomerate; subordinate basaltic andesite lava flows and flow breccias*

lKMa — *Laterally continuous beds of black argillite, locally with thinly-bedded siltstone and sandstone and pebble conglomerate*

JURASSIC TO ?CRETACEOUS

JKm — *Mainly orthogneisses and migmatitic gneisses of amphibolite grade; may include metamorphosed plutonic rocks:* EJHL, JKF, EKD

BATHONIAN TO ?CALLOVIAN
HAZELTON GROUP
NOOSGULCH ASSEMBLAGE (U/Pb ca. 163-165 Ma)

mJN — *Feldspathic sandstone and pebble conglomerate locally interstratified with rhyolite flows and welded ash-flow tuffs; black-white, thickly laminated tuffaceous mudstone in lower part of section; this shallow-marine succession in part overlies and is temporally equivalent with nearby subaerial rhyolitic lapilli tuff and aphanitic lava flows, minor ash-flow tuffs and porphyritic andesite lava flows; host succession for the Nifty VMS prospect*

TOARCIAN TO BAJOCIAN
SMITHERS FORMATION

lmJS — *Feldspathic sandstone, grit and pebble conglomerate, locally thick cobble and boulder conglomerate; interspersed fine-grained felsic tuff, locally significant welded rhyolite ignimbrite, minor dacite and rhyolite flows; felsic volcanic events are time-stratigraphic with the Nanika member of the Smithers Formation in Whitesail Lake map area*

?PLIENSBACHIAN TO TOARCIAN

lJHv — *Basalt and andesite lava flows, dark green, aphanitic to medium-grained porphyries; rare planar-cross-stratified grey limestone containing crudely layered scoriaceous basalt clasts, interlayered with flow breccia; volumetrically minor cobble conglomerate and sandstone; maroon and green dacitic to rhyolitic lapilli and finer tuffs (ca. 191 Ma) form prominent stratified units within massive mafic lava flows west of the East Sakumtha River; west of the Crag Creek fault a presumably correlative succession includes substantial sedimentary rocks (*lJHs*) interlayered with amygdaloidal and porphyritic basalt flows with locally thick hyaloclastites and rare pillowed lavas*

lJHs — *Dominantly sedimentary strata; feldspathic sandstone, locally turbiditic; black argillite, locally with thin cross-stratified calcareous sandstone to sandy limestone; granule to cobble conglomerate; lapilli tuff and ash-flow tuff; lesser basaltic andesite, basalt flows and breccia; complexly interfingered with* lJHv

lJHa — *Laterally continuous beds of black argillite, locally with thinly-bedded siltstone and sandstone and pebble to cobble conglomerate; marine fossils present locally as poorly-preserved moulds*

?LOWER JURASSIC

JHvp — *Undifferentiated aphanitic basaltic flows that appear recrystallized and grade imperceptibly into fine-grained dioritic rocks; dark green with ubiquitous chlorite-epidote alteration; locally cut by northwest-trending pink plagioclase porphyry and granodiorite dykes presumed to be related to larger intrusions of the Firvale suite*

?TRIASSIC TO ?LOWER JURASSIC

?TrJv — *Undifferentiated basaltic and andesitic metavolcanic and volcaniclastic rocks; rare calc-silicate rock, marble, conglomerate; intruded locally by the Howe Lake suite; may include Cretaceous strata south of Noieck River*

PALEOZOIC?
BURKE CHANNEL ASSEMBLAGE

PBC — *Undifferentiated quartzite, semi-pelitic and pelitic schist; minor gneiss and marble; lesser mafic and felsic volcanic rocks and rare conglomerate; tightly folded and metamorphosed to amphibolite facies;* PBCa*: amphibolite gneiss with minor biotite schist layers;* PBCs*: mainly metasedimentary rocks with minor amphibolite*

INTRUSIVE ROCKS

PALEOGENE
EOCENE

Eg — *Post-tectonic plutons (U/Pb 52-56 Ma, Ar/Ar 52-53 Ma) that cut all ductile fabrics; generally felsic to intermediate in composition; equigranular to potassium feldspar-megacrystic; unfoliated except locally near the margins but with weak magmatic layering present locally; Nooskulla pluton (*EgN*): hornblende-biotite tonalite and granodiorite; Mesachie pluton (*EgM*): two-mica granite to biotite granodiorite; Sheemahant pluton (*EgS*): granodiorite, granite and tonalite*

Pg — *Undifferentiated tonalite, quartz diorite, diorite, granitic orthogneiss; fabric weakly strained to mylonitic; within Coast shear zone and especially along South Bentinck Arm may include fault slices of* PBC, ?TrJv, *and other older granitoid rocks*

CRETACEOUS TO PALEOGENE

KPd — *Undifferentiated dioritic plutons; hornblende diorite to biotite-hornblende tonalite; lesser quartz monzodiorite; pyroxene present locally; fine- to coarse-grained, generally equigranular; unfoliated to weakly foliated*

?LATE CRETACEOUS TO ?EOCENE

LKEp — *Undifferentiated granitic plutons: hornblende-biotite granodiorite to granite, fine- to medium-grained, equigranular*

LATE CRETACEOUS TO PALEOCENE
FOUR MILE PLUTONIC SUITE (U/Pb ca. 67-73 Ma)

LKFM — *Muscovite-biotite granite, coarse-grained, equigranular; locally contains garnet, pink potassium feldspar megacrysts; aplite dykes with pegmatitic segregations bearing garnet and muscovite; unfoliated except possibly at margins; forms prominent exposures characterized by 'onion-skin' exfoliation joints*

LATE CRETACEOUS
FOUGNER PLUTONIC SUITE (U/Pb ca. 67-68 Ma)

LKF — *Hornblende-biotite-±pyroxene-quartz diorite to granodiorite with conspicuous sphene; medium- to coarse-grained, equigranular to locally inequigranular with potassium feldspar megacrysts, homogeneous; distinct salt-and-pepper fresh appearance*

BIG SNOW PLUTONIC SUITE (U/Pb ca. 79-95 Ma)

LKBS — *Biotite monzogranite, biotite-±hornblende tonalite to granodiorite, coarse-grained, equigranular; inclusions rare*

MOUNT DAUNT PLUTON (U/Pb ca. 91 Ma)

LKMD — *Biotite-hornblende tonalite with mylonitic to protomylonitic fabric*

EARLY CRETACEOUS
MELIKAN PLUTON (U/Pb ca. 110 Ma)

EKM — *Biotite-hornblende tonalite and lesser quartz diorite, unfoliated; weak to strong epidote and chlorite alteration; cut by numerous mafic dykes; lithologically similar to* PKF

DESIRE PLUTONIC SUITE (U/Pb ca. 118-124 Ma)

EKD — *Fine- to medium-grained hornblende diorite to quartz diorite and medium- to coarse-grained biotite-hornblende tonalite, equigranular; abundant screens and xenoliths of metavolcanic rock and amphibolite; displays magmatic and tectonic foliation; similar in field aspects to* EJHL

JURASSIC TO CRETACEOUS

JKP — *Undifferentiated granodiorite, diorite, and hornblende-biotite tonalite*

FIRVALE PLUTONIC SUITE (U/Pb ca. 131-140, 148-164 Ma)

JKF — *Hornblende-biotite granodiorite and quartz diorite, medium- to coarse-grained, equigranular; light pink-green colour due to incipient chlorite alteration; cut by northerly-trending mafic dykes in swarms and spaced bodies; incorporates Stick Pass plutonic suite from earlier published maps*

MIDDLE JURASSIC
TRAPPER PEAK PLUTON (U/Pb ca. 170 Ma)

MJTP — *Hornblende granite to lesser biotite-hornblende granite, medium- to coarse-grained, equigranular to inequigranular; distinct light purple to medium pink potassium feldspar oikocrysts enclose quartz, hornblende and plagioclase; saussuritized plagioclase imparts light green colour; cut locally by epidote veins and numerous hornblende andesite, basalt, and rhyolite dykes*

EARLY JURASSIC
HOWE LAKE PLUTONIC SUITE (U/Pb ca. 182-190 Ma)

EJHL — *Fine- to coarse-grained pyroxene-hornblende diorite to quartz diorite and medium- to coarse-grained biotite-hornblende tonalite; abundant metavolcanic screens and mafic xenoliths, commonly metamorphosed to amphibole grade; widespread magmatic and tectonic foliation; may be subvolcanic to Hazelton Group strata*

TENAIKO PLUTONIC SUITE

JT — *Compositionally and texturally heterogeneous assemblage of coarse-grained pyroxene-hornblende gabbro to medium- to coarse-grained hornblende diorite to quartz diorite; lesser hornblende granodiorite; locally contains abundant mafic and ultramafic xenoliths and metavolcanic screens ranging from a few centimetres to 10s of metres in length*

SYMBOLS

- *Geological contact (defined, approximate, assumed)*
- *Fault, undifferentiated (defined, approximate, assumed)*
- *Fault, normal, down dropped on side with balls (defined, approximate, assumed)*
- *Fault, compressional, defined, approximate, assumed (teeth on upthrust side)*
- *Strike slip fault, defined, approximate (shaded under Qal and water)*
- *Shear zone*
- *Discrete shear zone (inclined, vertical)*
- *Antiform (defined and approximate)*
- *Synform (defined and approximate)*
- *Fold axis*
- *Axial plane*
- *Bedding (tops unknown inclined, tops known inclined, overturned, vertical)*
- *Magmatic foliation and layering*
- *Tectonic foliation (inclined, vertical; includes schistosity, gneissic foliation, cleavage, and may also include some magmatic foliations and foliations of unknown type)*
- *Mylonitic foliation (inclined, vertical)*
- *Mineral lineation**
- *Elongation lineation**
- *Lineation (undivided)*
- *Dyke (inclined, vertical)**
- *Glacial striae**
- *Fossil locality with ID number (see Sheet 3)*
- *Ar-Ar age determination locality with ID number (see Sheet 3)*
- *K-Ar age determination locality with ID number (see Sheet 3)*
- *U-Pb age determination locality with ID number (see Sheet 3)*
- *Gossan*
- *Landslide scarp*
- *Field station location where not indicated by other symbol (foliation, etc.)*
- *Limit of mapping*
- *Park boundary*
- *Road, hard surface (more than 2 lanes, 2 lanes, less than 2 lanes)*
- *MINFILE occurrence with ID number*

**data not collected consistently across map-area*

MINFILE*

NUMBER	MINFILNO	NAME	STATUS	COMMODITIES	DEPTYPE
1	093D 002	BOOM	SHOW	CU, MO	L04
2	093D 005	CC	SHOW	CU	D03, L04
3	093D 001	RUSS	SHOW	MO, CU	
4	093D 004	DEAN CHANNEL	PAPR	FE, MA	K03
5	093D 014	NUMAS	SHOW	CU, MO	
6	093D 035	SWALLOP CREEK	SHOW	KY	P02
7	093D 009	BELLA COOLA CHIEF (L.176)	SHOW	CU, AG, AU	
8	093D 006	NIFTY	PROS	AG, CU, AU, ZN, BAR, PB	?
9	093D 007	KEEN	PROS	CU, ZN, PB, AG	?
10	093D 023	JAMTART	SHOW	PB, ZN	

* Data from British Columbia Geological Survey Branch MINFILE Mineral Inventory
STATUS abbreviations: SHOW = Showing, PAPR = Past Producer, PROS = Prospect
COMMODITY abbreviations: AG = Silver, AU = Gold, BAR = Barite, CU = Copper, FE = Iron, KY = Kyanite, MA = Magnetite, MO = Molybdenum, PB = Lead, ZN = Zinc
DEPTYPE abbreviations: D03 = Volcanic redbed Cu; K03 = Fe skarn; L04 = Porphyry Cu +/- Mo +/- Au; P02 = Kyanite-sillimanite schists, ? = Noranda/Kuroko massive sulphide Cu-Pb-Zn

OPEN FILE
DOSSIER PUBLIC
5385
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
2006
SHEET 1 OF 3
FEUILLET 1 DE 3

Sheet 1 of 3, Geology (North half)

Recommended citation:
Haggart, J.W., Diakow, L.J., Mahoney, J.B., Woodsworth, G.J., Struik, L.C., Gordee, S.M., and Rusmore, M.
2006: Geology, Bella Coola region (93D/01, /07, /08, /10, /15 and parts of 93D/02, /03, /06, /09, /11, /14, /16 and 92M/15 and /16), British Columbia; Geological Survey of Canada, Open File 5385; British Columbia Geological Survey, Geoscience Map 2006-7, scale 1:100 000.