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GEOLOGICAL SURVEY OF CANADA   COMMISSION GÉOLOGIQUE DU CANADA

TECTONIC ASSEMBLAGES AND PLUTONIC SUITES
(from Wheeler and McFeely, 1991)

Tectonic assemblages represent distinctive successions of stratified rocks, mainly bounded by unconformities or faults, deposited in specific tectonic environments during particular intervals of time. Thus they are fundamental components of Cordilleran geology that reflect its evolution and allow comparisons of the tectonic behaviour of various regions during specific intervals of time.

An assemblage may comprise one or more formations from a single region or from several separate regions. Most assemblages are named for an important constituent or group, although a few are named after the region in which the assemblage is best developed. Very few are not yet named. The age assigned to each assemblage reflects the age range of its components. Each assemblage is characterized in terms of its tectonic or depositional setting, the latter illustrated by descriptions of its principal lithologies, facies variations, source areas and other criteria.

The degrees of confidence in the identification of the associated tectonic or depositional regimes vary considerably and, in some cases are controversial. Most assemblages are categorized in terms of environments currently observable on modern continental margins, island arcs and ocean basins. Others are defined with reference to their positions relative to the orogen (foredeep clastic wedge) or to the craton (passive continental margin sediments).

The plutonic suites are defined mainly by age and subdivided on the basis of composition or other attributes. They are grouped, for the most part, into magmatic episodes (Armstrong, 1985).

REFERENCES

Armstrong, R.L.
1985: Mesozoic - early Cenozoic plutonism in the Canadian Cordillera - distribution in time and space; Geological Society of America, Abstracts and programs, 1985, v. 17, p 338

Wheeler, J.O. and McFeely, P.
1991: Tectonic Assemblage Map of the Canadian Cordillera and adjacent parts of the United States of America; Geological Survey of Canada, Map 1712A, scale 1:2 000 000

SOURCES OF INFORMATION

Geological information contained in the GIS map library and the 1:1,000,000 scale folio series is derived directly from John Wheeler's Tectonic Assemblage Map of the Canadian Cordillera (Wheeler and McFeely, 1991; Map 1712A), and is subject to all Copyright laws for distribution in either digital or hard copy form. This map is a revision of the Geological Survey of Canada Map 1505A by Tipper, Woodsworth, and Gabrielse, published in 1981. It is a compilation of published maps, thesis, and unpublished information from officers of the Geological Survey of Canada; from J.G. Abbott, G.W. Lowey, and J.A. Morin of the Geology Section, Department of Indian and Northern Affairs , Whitehorse, Yukon; from D.A. Brew, J.H. Dover, C. Dusel-Bacon, H.L. Foster, J.E. Harrison, W.J. Nokleberg, G. Plafker, and R.W. Tabor of the U.S. Geological Survey; and from R.L. Armstrong, M.T. Brandon, R.L. Brown, D.S. Cowan, P. Erdmer, J. Fillipone, R.M. Friedman, J.T. Fyles, J.M. Hamilton, C.J.R. Hart, R.A. Haugerud, C.J. Hickson, P.M. Holbek, G.A. Jilson, D.L. Jones, A. Jung, W.C. McLelland, E.W. Mountjoy, J.K. Mortensen, D.C. Murphy, J.S. Oldow, R.A. Price, P.B. Read, T.A. Richards, M.E. Rusmore, C.M. Rubin, P.S. Simony, A. Sutherland Brown, R.S. Tolbert, P. van der Heyden, and W.J. Wolfe. Geological cartography for the original version of this map was by M. Sigouin, Geoscience Information Division.

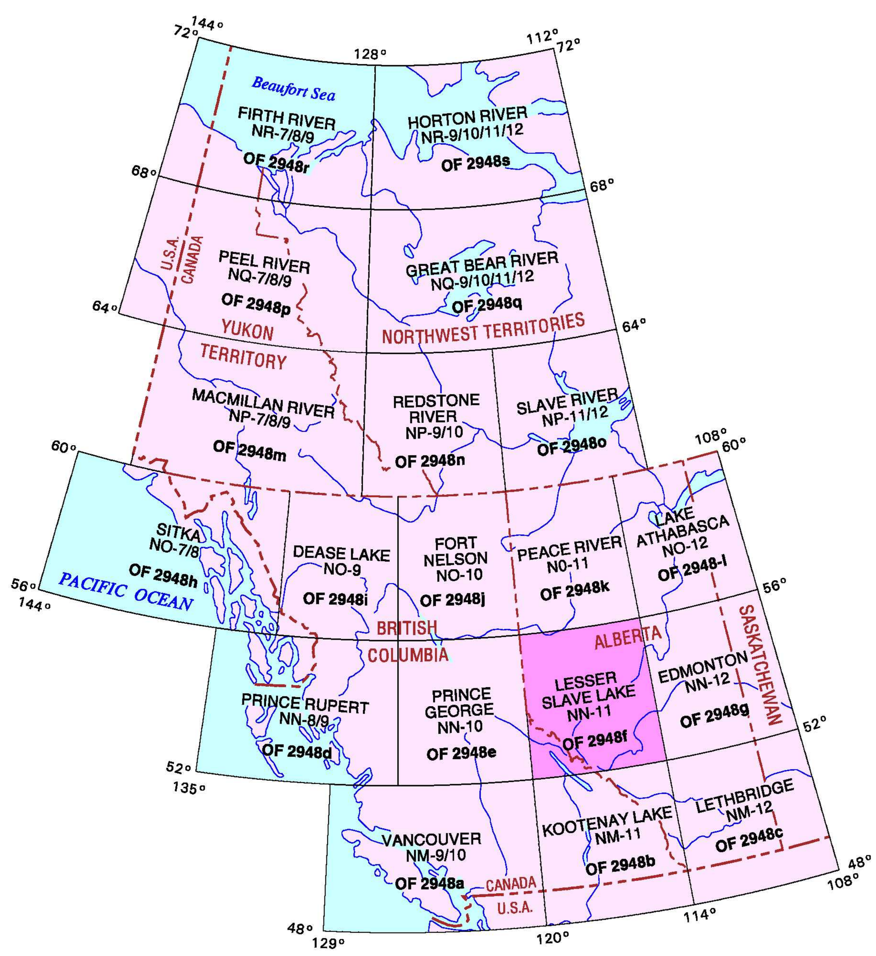
GIS MAP LIBRARY

The Cordilleran GIS Map Library was initiated in March, 1993 as a collaborative research and development project by the Pacific Division and the Geoscience Information Division (GID) of the Earth Sciences Sector (ESS). The goal is to develop an integrated 1:1,000,000 scale digital geoscience database for the Canadian Cordillera that can be used as an archive and research facility by the Geological Survey of Canada (GSC) and its clients. This map is part of a new series of 1:1,000,000 scale tectonic assemblage maps for the Canadian Cordillera based on the Wheeler and McFeely (1991) Tectonic Assemblage Map of the Canadian Cordillera (Map 1712A). It is one of 19 digital data sets derived from the Cordilleran GIS Map Library CDROM (GSC Open File 2948).

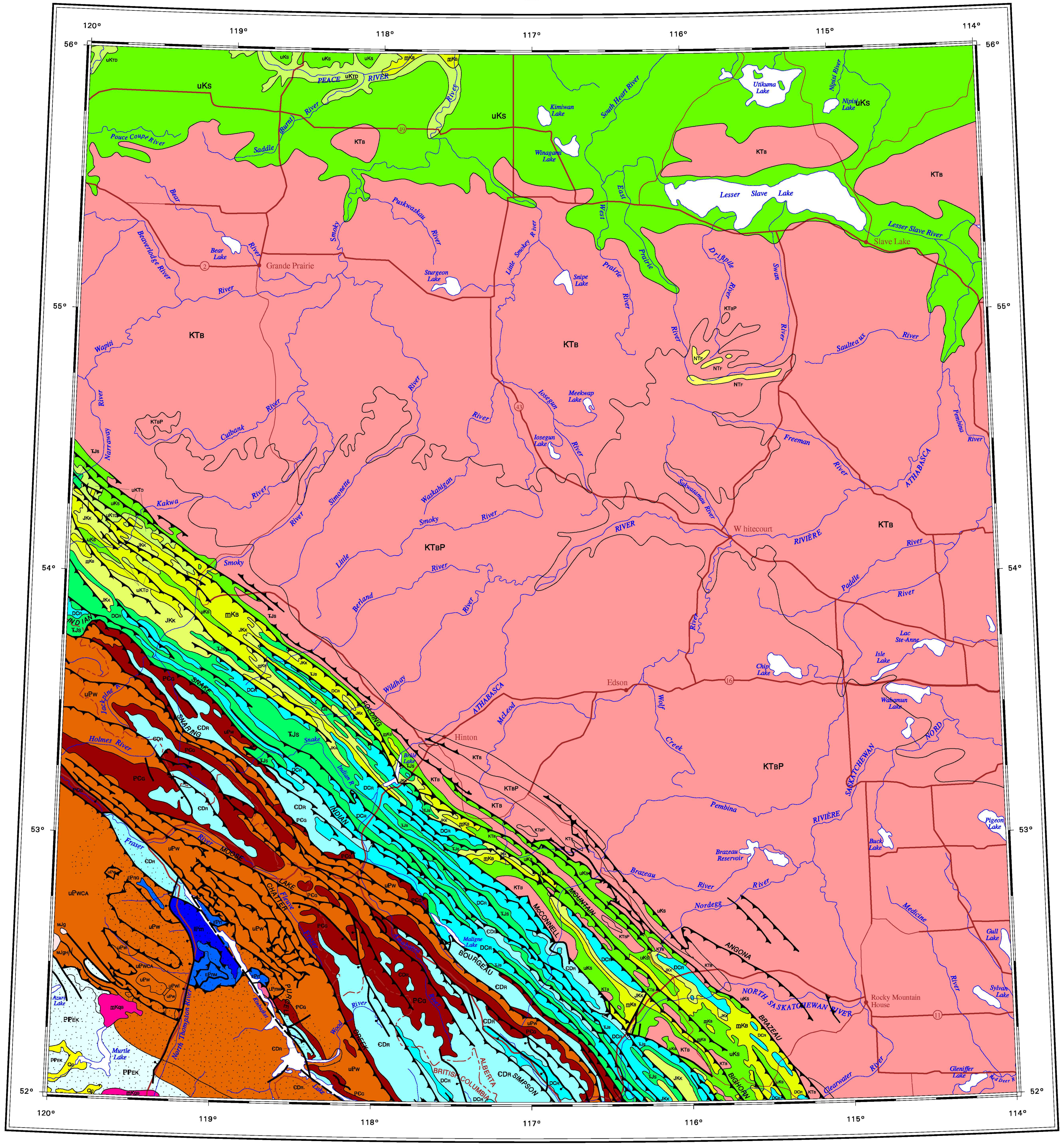
The legend which accompanies Map 1712A was converted to digital format and made available to the GSC by Doug Brownlee, and has been modified and expanded for use as a GIS database. Design and implementation of the digital GIS map library structure, final editing and attributing of all geological and geographic features and cartographic production of the 1:1,000,000 scale folio series were performed by Stephen Williams and Murray Journeay of the GSC Pacific Division, and Richard Allard of the Geoscience Information Division.

The geographic base for the GIS library and the 1:1,000,000 scale folio series is derived from the National Atlas Information System (NAIS) 1: 2,000,000 digital map series and is subject to all Copyright laws for distribution in either digital or hard copy form.

CORDILLERAN TECTONIC ASSEMBLAGE MAP LIBRARY



TECTONIC ASSEMBLAGES
OF THE
LESSER SLAVE LAKE MAP AREA
1:1 000 000
GSC OPEN FILE 2948f



OPEN FILE 2948f

TECTONIC ASSEMBLAGE MAP

LESSER SLAVE LAKE

ALBERTA - BRITISH COLUMBIA

Scale 1:1 000 000 - Échelle 1/1 000 000

kilometres 25 0 25 50 75 kilomètres

Lambert Conformal Conic Projection
Standard Parallels 52°40' and 55°20'

Projection conique conforme de Lambert
Parallèles d'échelle conservée 52°40' et 55°20'

LEGEND

TECTONIC ASSEMBLAGES

QUATERNARY

Qc — *CLEARWATER: transtensional back-arc volcanics; alkaline to tholeiitic olivine basalt flows, pyroclastics, volcanoes and cones; contains lherzolite nodules; nonmarine*

NEOGENE

NTF — *FRASER: alluvial sediments; poorly consolidated alluvial conglomerate, sandstone, mudstone, with local lignite, tuff, breccia and diatomite; nonmarine*

UPPER CRETACEOUS - OLIGOCENE

KTB — *BRAZEAU: foredeep clastic wedge; eastward prograding alluvial sandstone, conglomerate, shale, coal and local tuff and bentonite. In southern foredeep lower part grades eastward into marine shale; upper part nonmarine Paleocene (KTBP)*

UPPER CRETACEOUS

uKT — *TREVOR: southwesterly derived clastic wedge; interbedded calcareous and glauconitic sandstone and mudstone, bentonitic shale, and local ironstone lenses; also includes Dunvegan conglomerate, sandstone, siltstone and shale (uKTD); marine*

uKs — *SMOKY: foredeep marine shales; sideritic and calcareous shale, siltstone and sandstone forming two megacycles; marine*

MID-CRETACEOUS

mKB — *BLAIRMORE: foredeep clastic wedge; mainly eastward prograding deltaic clastics: basal chert-pebble conglomerate, sandstone, locally with metamorphic, granitic and volcanic detritus, shale, coal; alkaline volcanics at top; marine and nonmarine*

UPPER JURASSIC - LOWER CRETACEOUS

JKK — *KOOTENAY: foredeep clastic wedge; marine sandstone and mudstone grading westward and southward into northward prograding fluvial deltaic sandstone, chert-pebble conglomerate, mudstone, and coal; marine and nonmarine*

TRIASSIC - JURASSIC

TJs — *SPRAY RIVER: continental margin prism: Jurassic shale, organic-rich paper shale, sandstone, phosphatic and cherty limestone; Triassic shoaling-upward marine siltstone, sandstone, limestone, dolostone, collapse breccia, rare gypsum; marine*

DEVONIAN - CARBONIFEROUS

DCR — *RUNDLE: continental shelf carbonate and shale; Carboniferous shelf and slope limestone, lime grainstone, dolomite, sandy dolomite, crossbedded sandstone, shale, dark, locally bituminous shale, dolomitic shale; tuff in Exshaw Formation; Upper Devonian platform and reef limestone and dolomite, detrital carbonate channel deposits, grey, green and red shale, sandstone, breccia; marine*

UPPER PROTEROZOIC - PALEOZOIC

PPEK — *EAGLE BAY: clastics and volcanics of pericratonic Kootenay Terrane and Devonian and older magmatic arc rocks in Yukon-Tanana Terrane; Paleozoic phyllite, siltstone, sandstone, grit, minor limestone, which near Quesnel Lake contains fossil fragments, Devonian felsic metavolcanics and older magmatic arc rocks and fragmentals overlying black siliceous argillite, ribbon chert, quartzite, and local archeocyathid-bearing limestone in mafic metavolcanics, Proterozoic olive green and grey grit, quartzite and carbonate, and metamorphic equivalents; mainly marine*

CAMBRIAN - DEVONIAN

ЄDR — *ROCKY MOUNTAINS: passive continental margin sediments; resistant dolomite, limestone, and local sandstone interbedded with recessive red, green, and grey shale and detrital carbonate that together form several carbonate-shale grand cycles. These pass westward into offshelf shale, siltstone and thin-bedded carbonate with minor alkalic tuff, breccia and amygdaloidal basalt of Cambrian, Cambro-Ordovician, Silurian, and Devonian ages but mainly of Ordovician age; marine*

UPPER PROTEROZOIC - LOWER CAMBRIAN

PЄG — *GOG: rifted and passive continental margin sediments; shallow-water crossbedded orthoquartzite, feldspathic quartzite, locally graded-bedded quartzite, quartz-pebble conglomerate, mafic flows, breccia and tuff overlain by interbedded quartzite, siltstone, shale, and limestone with archeocyathid reefs; metamorphic equivalents; marine*

UPPER PROTEROZOIC

uPW — *WINDERMERE: mainly clastic continental margin sediments; uPWCA in Cariboo Subterrane; graded-bedded assemblage of interbedded quartz-feldspar grit, sandstone, siltstone and shale, commonly maroon and green; diamictite in Rocky Mountains, limestone in upper part, local greenstone flows, breccia and tuff, and metamorphic equivalents. "Middle Marble" marker (uPWl); marine*

LOWER PROTEROZOIC

lPm — *Craton related paragneiss and metasediments; may include younger Proterozoic and lower Paleozoic rocks in Monashee Complex; core paragneiss unconformably overlain by basal quartzitic conglomerate succeeded by pelitic psammitic and calc-silicate gneisses in turn overlain by psammitic gneiss*

PLUTONIC AND ULTRAMAFIC ROCKS

Plutonic suite....Bayonne   Pluton....(Hobson L.)

MID-CRETACEOUS (87 - 130 Ma)

mK — mKqB - *Bayonne: discordant, biotite and biotite-muscovite leucoquartz monzonite or granite: biotite-hornblende granodiorite and quartz monzonite; all locally porphyritic;* mKgB - *undivided granodiorite, leucogranodiorite, quartz monzonite, quartz diorite, tonalite*

MIDDLE JURASSIC (155 - 187 Ma)

MJ — MJg - *foliated hornblende-biotite quartz diorite and granodiorite in Central Coast Plutonic Complex, altered to greenschist-facies along E. margin* MJgH - *(Hobson L.): undivided granodiorite, leucogranodiorite, quartz monzonite, quartz diorite, tonalite*

LATE PROTEROZOIC

LP — LPnM - *(Malton, part): lineated leucocratic granitic gneiss*

EARLY PROTEROZOIC

EP — EPnM - *(Malton): lineated leucocratic orthogneiss; lineated and mylonitic potash feldspar-biotite augen gneiss; alkaline granite, tonalite and mafic gneiss*
EPnG - *Gold Creek orthogneiss*
EPn - *predominantly orthogneiss*

VOLCANIC ROCKS

Tholeiitic volcanic rocks

METAMORPHIC ROCKS (protolith uncertain)

Protolith metamorphosed to amphibolite facies

SYMBOLS

Geological contact (defined)

Thrust fault (teeth on upper plate)

Extension fault (solid circle indicates downthrow side)

Right lateral transcurrent fault

Fault of unknown displacement

Submerged faults and those buried by younger strata

British Columbia
Mineral Development Agreement
Canada

Contribution to Canada - British Columbia Agreement on Mineral Development (1991 - 1995), a subsidiary agreement under the Canada - British Columbia Economic and Regional Development Agreement.

Contribution à l'Entente Canada - Colombie-Britannique sur l'exploitation minérale (1991 - 1995), entente auxiliaire négociée en vertu de l'Entente Canada - Colombie-Britannique de développement économique et régional.

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