YUKON GEOLOGICAL SURVEY

LEGEND

(modified and updated from legend of Gordey and Makepeace, 2001)

QUATERNARY

Q — **QUATERNARY:** *unconsolidated glacial, glaciofluvial and glaciolacustrine deposits; fluviatile silt, sand, and gravel, and local volcanic ash, in part with cover of soil and organic deposits*

TERTIARY(?) AND QUATERNARY

TQs — **SELKIRK:** *resistant, brown weathering, columnar jointed, vesicular to massive basalt flows; minor pillow basalt; basaltic tuff and breccia (Selkirk Volcanics)*

PLIOCENE

PWs — **WALSH:** *undivided felsic volcanics and conglomerate, sandstone, and mudstone; resistant, thick bedded to massive, well-indurated conglomerate with minor interbedded sandstone; white mudstone with interbedded gritty sandstone and minor coal (Walsh Creek)*

MIOCENE TO PLIOCENE

MPMC — **MILES CANYON:** *dark red to brown weathering, columnar jointed olivine basalt flows, commonly amygdaloidal and vesicular; ultramafic xenoliths (Miles Canyon Basalt)*

LOWER EOCENE

lES — **SKUKUM:** *various felsic volcanic dykes, plugs, domes, laccoliths and flows (f) and intermediate volcaniclastics (i)*
f, flow banded rhyolite flows and breccia, andesite flows and breccia, tuff, pyroclastic and epiclastic rocks, granite conglomerate; rhyolite feldspar porphyry domes, plugs and laccoliths; feldspar hornblende quartz-phyric felsite dykes and plugs (Skukum Gp. including Boudette Creek, Butte Creek, Cleft Mountain, Crozier Breccia, Crozier Tuff and Lava, Gault, Jones Creek, Lemieux Creek, MacCauley Creek, Mount Reid, Partridge Lake, Vesuvius? and Watson River)
i, heterogeneous intermediate to felsic, hornblende-feldspar porphyritic tuff, flow breccia; volcaniclastic mudstone, sandstone and conglomerate; aphanitic to feldspar porphyritic dacite flows and dykes; flow-banded rhyolite and felsic dykes and sills (Mount Creedon Volcanics, some strata formerly mapped as Mt. Nansen Gp.)

EARLY TERTIARY

ETN — **NISLING RANGE SUITE:** *medium to coarse grained equigranular to porphyritic rocks of intermediate composition (g), fine to coarse grained, equigranular and porphyritic granitic rocks of felsic composition (q) and felsic dyke rocks (f)*
f, orange and buff weathering light-coloured feldspar porphyry dyke and flow rocks of intermediate to acid composition
g, biotite-hornblende granodiorite (locally K-feldspar megacrysts), quartz monzonite, quartz diorite; minor granodiorite-gneiss; hornblende and biotite hornblende diorite; biotite quartz feldspar porphyry and porphyritic biotite quartz monzonite (Ruby Range Suite)
q, leucocratic, biotite granite; miarolitic alaskite; saccharoidal textured, mafic-poor biotite granite; biotite-hornblende granite to leucocratic granodiorite with sparse, white, alkali feldspar phenocrysts; biotite quartz monzonite (Nisling Range Suite, Nisling Range Alaskite, Coffee Creek Granite, Annie Ned Granite)

LOWER TERTIARY, MOSTLY(?) EOCENE

lTR — **ROSS:** *mixed bimodal volcanics (basalt (v), rhyolite (f)) and terrestrial clastics (s), dominantly along or near Tintina Fault; farther removed, scattered occurrences of rhyolitic lava and dykes (p) are also included*
v, locally amygdaloidal, dark grey-green olivine basalt necks and flows; subaerial and subaqueous (locally pillowed); volcaniclastic rocks; minor olivine gabbro; locally plagioclase-phyric basalt and diabase dykes; minor shale and conglomerate
f, rhyolite flows, tuffs, ash-flow tuffs and breccias, locally laminated; small stocks and necks of white weathering, flow-banded, quartz-sanidine porphyry to granite porphyry, locally obsidian bearing; local shale, sandstone and conglomerate
s, brown, thin bedded, claystone, siltstone, shale and coal; arkosic or chert rich, thick bedded micaceous sandstone; thick bedded to massive pebble to boulder, chert-quartz conglomerate
p, light coloured felsic quartz feldspar porphyry and rhyolite; minor acid tuff breccia, crystal lithic tuff and ignimbrite; quartz-feldspar porphyry stocks and dykes

UPPER CRETACEOUS

uKC — **CARMACKS:** *a volcanic succession dominated by basic volcanic strata (v), but including felsic volcanic rocks dominantly (?) at the base of the succession (f) and locally, basal clastic strata (s); gabbro (g) (ca. 68-70 Ma)*
v, augite olivine basalt and breccia; hornblende feldspar porphyry andesite and dacite flows; vesicular, augite phyric andesite and trachyte; minor sandy tuff, granite boulder conglomerate, agglomerate and associated epiclastic rocks (Carmacks Gp., Little Ridge Volcanics, Casino Volcanics)
f, acid vitric crystal tuff, lapilli tuff and welded tuff including feeder plugs and necks; felsic volcanic flow rocks and quartz feldspar porphyries; green and purple massive tuff-breccia with feldspar phyric fragments (Carmacks Gp., Donjek Volcanics, some rocks formerly mapped as Mt. Nansen Gp.; the felsic part of the Carmacks Gp. is difficult to distinguish from similar Tertiary and mid-Cretaceous (Mt. Nansen) felsic volcanic strata)
s, medium-bedded, poorly sorted, coarse to fine-grained sandstone, pebble conglomerate, shale, tuff, and coal; massive to thick bedded locally derived granite or quartzite pebble to boulder conglomerate (Carmacks Gp.)
g, medium to coarse-grained, hornblende gabbro; pyroxenite

uKW — **WINDY-TABLE:** *resistant, columnar jointed, quartz-phyric dacite flows, ash and lapilli tuff; maroon weathering, basal sedimentary and epiclastic rocks; dacite flows and flow breccia; brown basalt flows; includes dykes of quartz feldspar porphyry (ca. 80 Ma) (Open Creek Volcanics)*

LATE CRETACEOUS TO TERTIARY

LKP — **PROSPECTOR MOUNTAIN SUITE:** *grey, fine to coarse-grained, massive, granitic rocks of felsic (q), intermediate (g), syenitic (y), rarely mafic (d) composition and related felsic dykes (f)*
d, coarsely crystalline gabbro and diorite
f, hornblende-biotite granodiorite, hornblende diorite, quartz diorite (Wheaton Valley Granodiorite)
q, quartz monzonite, biotite quartz-rich granite; porphyritic alaskite and granite with plagioclase and quartz-eye phenocrysts; biotite and hornblende quartz monzodiorite, granite, and leucocratic granodiorite with local alkali feldspar phenocrysts (Prospector Mountain Suite, Carcross Pluton)
y, syenite
f, quartz-feldspar porphyry

MID-CRETACEOUS

mKN — **MOUNT NANSEN:** *massive aphyric or feldspar-phyric andesite to dacite flows, breccia and tuff; massive, heterolithic, quartz and feldspar-phyric, felsic lapilli tuff; flow-banded quartz-phyric rhyolite and quartz-feldspar porphyry plugs, dykes, sills and breccia (Mount Nansen Gp., Byng Creek Volcanics, Hutshi Gp.)*

mKW — **WHITEHORSE SUITE:** *grey, medium to coarse-grained, generally equigranular granitic rocks of felsic (q), intermediate (g), locally mafic (d) and rarely syenitic (y) composition (ca. 112-105 Ma)*
d, hornblende diorite, biotite-hornblende quartz diorite and mesocratic, often strongly magnetic, hypersthene-hornblende diorite, quartz diorite and gabbro (Whitehorse Suite, Coast Intrusions)
g, biotite-hornblende granodiorite, hornblende quartz diorite and hornblende diorite; leucocratic, biotite hornblende granodiorite locally with sparse grey and pink potassium feldspar phenocrysts (Whitehorse Suite, Casino granodiorite, McClintock granodiorite, Nisling Range granodiorite)
q, biotite quartz-monzonite, biotite granite and leucogranite, pink granophyric quartz monzonite, porphyritic biotite leucogranite, locally porphyritic (K-feldspar) hornblende monzonite to syenite, and locally porphyritic leucocratic quartz monzonite (Mt. McIntyre Suite, Whitehorse Suite, Casino Intrusions, Mt. Ward Granite, Coffee Creek Granite)
y, hornblende syenite, grading to granite or granodiorite (Whitehorse Suite)

EARLY CRETACEOUS

EKgT — **TESLIN SUITE:** *leucocratic, fine to coarse-grained, equigranular, hornblende-biotite granite, granodiorite, quartz monzonite and quartz monzodiorite, locally with sparse grey and pink potassium feldspar phenocrysts; associated aplitic phases and dykes (Teslin Suite)*

MIDDLE JURASSIC

MJB — **BRYDE SUITE:** *undeformed granitic rocks from two plutonic bodies one of predominantly felsic (q) and the other of intermediate composition (g)*
g, medium to fine-grained, equigranular, leucocratic monzonite, syenite and granite and related dykes of dacite to andesite porphyry with euhedral andesine, hornblende and locally quartz in aphanitic greenish, or grey groundmass (Teslin Crossing Stock)
q, medium-grained, hornblende monzodiorite, hornblende-biotite quartz monzodiorite and minor hornblendite; pink, potassium feldspar megacrystic, hornblende granite to granodiorite and associated easterly trending mafic dyke swarms (Mt. Bryde Pluton; Bennett Granite)

EARLY JURASSIC

EJL — **LONG LAKE SUITE:** *mostly felsic granitic rocks (q) but locally grading to syenitic (y)*
q, massive to weakly foliated, fine to coarse grained biotite, biotite-muscovite and biotite-hornblende quartz monzonite to granite, including abundant pegmatite and aplite phases; commonly K-feldspar megacrystic (Long Lake Suite)
y, resistant, dark weathering, massive, coarse- to very coarse- grained and porphyritic, mesocratic hornblende syenite; locally sheared, commonly fractured and saussuritized; locally has well developed layering of aligned pink K-feldspar tablets (Big Creek Syenite)

LATE TRIASSIC TO EARLY JURASSIC

EJgA — **AISHIHIK SUITE:** *mostly intermediate granitoid (g) but locally diorite to gabbro (gb)*
g, medium to coarse-grained, foliated biotite-hornblende granodiorite; biotite-rich screens and gneissic schlieren; foliated hornblende diorite to monzodiorite with local K-feldspar megacrysts; may include unfoliated granite of the Long Lake Suite (Aishihik Suite)
gb, coarse-grained to pegmatitic hornblende gabbro; pyroxenite

MAP SYMBOLS

- geologic contacts
- fault; movement not known
- thrust fault (*ornament on hanging wall*)
- normal fault (*ornament on downthrown side*)
- dextral strike-slip fault
- fold axial trace (*anticline, syncline*)
- bedding (*horizontal, inclined, vertical, upright, overturned*) — 34, 46, 75
- dominant foliation (*horizontal, inclined, vertical*) — 60
- geochronology locality (U-Pb; Ar-Ar; K-Ar; Re-Os; fission track) (*most significant age indicated; italic numbers refer to geochronology tables in Appendix*) — U 108 Ma *14-15*; A K R T
- fossil locality (*italic numbers refer to fossil tables in Appendix*) — F *21-25*
- apparent dip of bedding, foliation (*in cross-section*)
- sense of displacement across strike-slip faults (*in cross-section - away, toward*)

MINERAL OCCURRENCES

(*number [e.g. 115I 065] refers to Yukon MINFILE database*)
(*selected, prominent occurrences are named on the maps*)

VOLCANIC ASSOCIATED
- Cu
- Pb,Zn,Barite
- Unknown

SEDIMENT ASSOCIATED
- Cu
- Fe,Mn,Ti,V
- Pb,Zn,Barite
- Unknown,Other

PORPHYRY & SHEETED VEINS
- Ag
- Au
- Cu
- Mo
- W,Sn,Ta,Be,Nb
- U
- Unknown,Other

SKARN/REPLACEMENT
- Au
- Cu
- Pb,Zn,Barite
- W,Sn,Ta,Be,Nb

VEIN/BRECCIA
- Ag
- Au
- Cu
- Hg,Sb
- Mo
- Pb,Zn,Barite
- Unknown,Other

MAFIC-ULTRAMAFIC ASSOCIATED
- Cu
- Ni,Co,Cr
- Unknown

INDUSTRIAL
- Asbestos
- Coal
- Limestone
- Ni,Co,Cr
- Unknown,Other

UNKNOWN
- Ag
- Au
- Cu
- Pb,Zn,Barite
- Unknown,Other

WHITEHORSE TROUGH

MIDDLE JURASSIC AND LOWER CRETACEOUS

mJKT — **TANTALUS:** *massive to thickly bedded chert pebble conglomerate and gritty quartz-chert-feldspar sandstone; interbedded dark grey mudstone, siltstone, lithic sandstone and coal; rare red-weathering dacite to andesite flows and tuff (Tantalus)*

LOWER AND MIDDLE JURASSIC, SINEMURIAN TO AALENIAN

JLr — **RICHTHOFEN:** *well-bedded, turbiditic sandstone-siltstone-mudstone; dark weathering, massive to finely laminated mudstone and limy mudstone; thick-bedded to massive lenses of polymictic cobble to boulder conglomerate; lithic sandstone; minor limestone (Laberge Gp.)*

LOWER TO MIDDLE JURASSIC, HETTANGIAN TO BAJOCIAN

JLt — **TANGLEFOOT:** *poorly sorted, medium bedded to massive lithic sandstone and minor mudstone with interbeds and thick members of resistant heterolithic pebble and boulder conglomerate; calcareous siltstone; minor ash and crystal tuff; coal; limestone (Laberge Gp.)*

LOWER JURASSIC, PLIENSBACHIAN

lJN — **NORDENSKIOLD:** *resistant, reddish brown weathering, massive, khaki-green dacite crystal tuff and volcaniclastic sandstone, with fresh plagioclase, hornblende and biotite; grades locally to pale green, punky weathering, salt and pepper textured, massive lithic sandstone; interbedded conglomerate (Laberge Gp.)*

STIKINIA

MESOZOIC

Mg — **MESOZOIC GRANITIC ROCKS UNDIVIDED:** *poorly described granitic rocks of uncertain age including diorite, quartz monzonite, and monzonite*

LATE TRIASSIC

LTgS — **STIKINE SUITE:** *coarse-grained, foliated, gabbroic hornblende orthogneiss; coarse-grained hornblende-biotite granite and granodiorite with K-feldspar megacrysts; foliated, fine to medium-grained hornblende quartz diorite to diorite with minor biotite (Tally Ho Leucogabbro, Little River Batholith, Friday Creek diorite)*

UPPER TRIASSIC, CARNIAN TO NORIAN

uTAKc, **uTAKh**, **uTAKm** — **AKSALA:** *mixed clastic-carbonate assemblage divisible into three dominant facies including calcareous lithic sandstone (c), locally thick carbonate (h) and maroon clastics (m) (Aksala fm, Lewes River Gp.)*
c, brown mudstone, black and minor red siltstone, greenish-grey, calcareous sandstone and interbedded bioclastic, argillaceous limestone; igneous or limestone-clast pebble and cobble conglomerate; laharic debris flows; rare feldspar-augite porphyry flows (Casca mb. of Aksala fm, Lewes River Gp.)
h, massive to thick bedded limestone; minor thin bedded argillaceous to sooty limestone; coarsely crystalline, massive dolostone; minor laminated chert; massive to poorly bedded, limestone conglomerate debris flows and fanglomerate; calcareous sandstone (Hancock mb. of Aksala fm, Lewes River Gp.)
m, maroon to red weathering, medium bedded, green and red sandstone, and pebble to boulder polymictic conglomerate; red mudstone and minor interbedded, bioturbated siltstone; crystal-rich sandstone and mudstone; coarse-grained, tan to brown, massive, lithic sandstone; minor limestone (Mandanna mb. of Aksala fm, Lewes River Gp.)

UPPER TRIASSIC, CARNIAN AND OLDER (?)

uTP — **POVOAS:** *augite or feldspar phyric, locally pillowed andesitic basalt flows, breccia, tuff, sandstone and mudstone; local dacitic breccia and tuff with minor limestone; greenschist, chlorite schist, chlorite-augite-feldspar gneiss, amphibolite (Povoas fm, Lewes River Gp.)*

MIDDLE TRIASSIC

mTJ — **JOE MOUNTAIN:** *massive basalt flows; fine to locally medium-grained feldspar and pyroxene?-phyric, pillowed andesite; variably altered massive microdiorite; heterolithic diamictite (Joe Mountain Volcanics)*
mTJg — *g, coarse-grained and locally pegmatitic, hornblende gabbro and diorite*

UPPER PALEOZOIC

uPT — **TAKHINI:** *variably sheared and metamorphosed metabasite, amphibolite gneiss, tuff, wacke and marble with minor quartz mica schist and orthogneiss*

CACHE CREEK

MIDDLE TRIASSIC TO LOWER JURASSIC

mTlJC — **CACHE CREEK:** *well bedded ribbon chert interbedded with shale, siltstone and greywacke (Cache Creek Gp.)*

CARBONIFEROUS TO TRIASSIC

CTC, **CTCum**, **CTCm** — **CACHE CREEK:** *oceanic assemblage of ultramafic rocks (um), volcanics (v), carbonate (m) and ribbon chert (c)*
um, dark rusty to dun brown weathering, strongly magnetic, variably tectonized, serpentinized and chloritized ultramafic rocks including medium to coarse-grained hornblende-pyroxene diorite gabbro, peridotite, dunite, serpentinite, and pyroxenite
v, andesitic and basaltic spherulitic greenstone, locally pillowed; aphanitic, tuffaceous(?) greenstone with clasts of limestone and chert; altered volcanic rocks with numerous serpentine bodies; massive, fine-grained metabasite and hornblende diorite
m, massive, finely crystalline, locally crinoidal and fusiline grey limestone; limestone, limestone breccia; massive to poorly bedded, medium-grained, recrystallized white to pale yellow limestone and crinoidal bioclastic limestone; rare dolostone
c, resistant, well-bedded, thin bedded, grey, black, red and brown chert, with lesser cherty sandstone and siltstone; minor thin limestone beds and pillow lava (Cache Creek Gp., Kedahda)

QUESNELLIA

UPPER TRIASSIC TO LOWER JURASSIC

uTJS, **uTJSm** — **SEMENOF:** *augite-phyric volcanic and volcaniclastic rocks (v), minor carbonate (m)*
v, augite-bearing sandstone and lesser siltstone and mudstone, possibly resedimented pyroclastic deposits; augite-phyric basalt flow and agglomerate; minor(?) augite-feldspar crystal tuff; minor volcanic breccia with clasts of augite (feldspar) porphyry (equivalent to Shonektaw, northern B.C.)
m, limestone; conglomerate

PENNSYLVANIAN

uCtK — **KELLY SUITE:** *strongly foliated, dark grey to dark green, fine to medium-grained, equigranular hornblende ± biotite tonalite; hornblende diorite to granodiorite*

LOWER AND MIDDLE PENNSYLVANIAN

uCB, **uCBm** — **BOSWELL:** *assemblage of recessive mixed clastic strata and minor volcanic rocks (s), altered mafic volcanics (v) and gabbro, limestone (m); possibly equivalent to the Klinkit assemblage? of Yukon-Tanana*
s, recessive, dark weathering, siliceous argillite, siltstone,arkosic sandstone, chert pebble to boulder conglomerate and breccia, volcanic breccia (Boswell)
v, resistant, massive, dark green, altered basalt, volcanic breccia and greenstone; amphibolite; foliated volcanic lithic sandstone; local rhyodacite porphyry and breccia (Boswell)
m, white weathering, massive to thick bedded, resistant, grey, micritic limestone; bioclastic limestone; marble (Boswell)

UPPER DEVONIAN TO LOWER MISSISSIPPIAN

uDMM, **uDMMm**, **uDMMum** — **MOOSE:** *mafic volcanic rocks (v), carbonate (m), minor clastic rocks (s) and intermediate volcanic rocks (i); locally, altered pyroxenite and serpentinite (um)*
v, dark green, fine-grained massive and pillow basalt; medium-grained plagioclase-phyric diorite; dark green to black biotite amphibolite and greenstone; plagioclase-phyric greenstone; white marble
m, light grey massive limestone; medium to coarse-grained, white and grey streaky marble
s, green conglomeratic sandstone with volcanic and sedimentary clasts
i, intermediate volcanic and volcaniclastic rocks
um, coarse-grained, altered pyroxenite; serpentinite

LEGEND EXPLANATION

LAYERED ROCK ASSEMBLAGES: *regionally mappable stratigraphic units, generally of Group or Formation rank; subunits denoted by lowercase suffix (bold in Legend); in some cases, significant marker units are shown by distinct colours or patterns; source stratigraphic units and correlatives are indicated in brackets where known.*

PLUTONIC SUITES: *grouping of plutonic rock units based on age, regional distribution and, in some cases, composition; some older plutonic suites are characteristic of a specific terrane; younger ones are commonly more widespread; composition, where known, is denoted by lowercase suffix (bold in Legend); names of included major plutons are shown in brackets.*

YUKON-TANANA

UPPER TRIASSIC

uTs — **SYNOROGENIC CLASTICS:** *resistant, massive, poorly sorted, conglomerate with pebble to cobble size clasts varying locally but including basalt, chert, mylonite, limestone, foliated hornblende granodiorite and quartz monzonite*

MIDDLE TO UPPER PERMIAN

Pqs — **SULPHUR CREEK SUITE:** *variably foliated, K-feldspar augen granite, metaporphyry (ca. 264-252 Ma)*

MIDDLE MISSISSIPPIAN TO LOWER PERMIAN

Ck, **Ckm** — **KLINKIT:** *mafic to intermediate volcanics (v), carbonate (m), clastics (s) and exhalite (c)*
v, mafic to intermediate calc-alkaline metavolcaniclastic and metavolcanic rocks; minor alkali metabasalt; marble; minor felsic metavolcanic rocks, quartz-muscovite schist
m, limestone, marble, locally fossiliferous
s, arkosic sandstone, basal polymictic metaconglomerate
c, chert, exhalite

LATE MISSISSIPPIAN

MqT — **TATLMAIN SUITE:** *mainly granite (q), minor gabbro (gb) (ca. 336-340 Ma)*
q, variably foliated to unfoliated, coarse-grained granite; medium-grained hornblende quartz diorite
gb, medium to coarse-grained hornblende gabbro

UPPER DEVONIAN TO LOWER MISSISSIPPIAN

DMF, **DMFv**, **DMFm**, **DMFcs**, **DMFum** — **FINLAYSON:** *mafic (v) to felsic (f) metavolcanic rocks of arc and back-arc affinities; carbonaceous pelite, metachert (cs); minor quartzite, metavolcaniclastic rocks (s); marble (m); ultramafic rocks (um) and metagabbro (gb)*
v, medium to dark green intermediate to mafic volcanic and volcaniclastic rocks; fine-grained amphibolite
m, light grey to white marble, locally crinoidal
s, light green, fine-grained siliciclastic and metavolcaniclastic rocks
f, felsic metavolcanic rocks, white quartz-muscovite schist, metaporphyry
cs, dark grey to black carbonaceous metasedimentary rocks, metachert
um, ultramafic rocks, serpentinite; gb, metagabbro

EARLY MISSISSIPPIAN

MSR — **SIMPSON RANGE SUITE:** *mainly granodiorite to tonalite (g), locally granite and augen granite (q) (ca. 345-355 Ma)*
g, foliated to strongly foliated, fine to medium-grained, hornblende-bearing metagrano-diorite, metadiorite and metatonalite
q, metagranite

LATE DEVONIAN TO EARLY MISSISSIPPIAN

DMgG — **GRASS LAKES SUITE:** *mainly augen granite (g), locally syenitic (y) (ca. 357-365 Ma)*
g, foliated, coarse-grained, K-feldspar-augen metagranite
y, unfoliated, coarse-grained to pegmatitic syenite, quartz monzonite (Ragged pluton)

UPPER DEVONIAN AND OLDER

PDS, **PDSm**, **PDSv** — **SNOWCAP:** *mainly metasiliciclastic rocks (s); minor marble (m), mafic metavolcanics (v) and ultramafic rocks (um); intruded by Devonian-Mississippian calc-alkaline plutons of the Grass Lakes and Simpson Range suites*
s, polydeformed and metamorphosed quartzite, psammite, pelite and marble; minor greenstone and amphibolite
m, light grey to buff weathering marble, generally lenticular and discontinuous
v, medium to coarse-grained amphibolite, commonly garnet-bearing; greenstone; minor marble
um, ultramafic rocks, serpentinite; metagabbro; metapyroxenite

SLIDE MTN

UPPER DEVONIAN TO LOWER PERMIAN

CPSM — **SLIDE MOUNTAIN:** *basalt (v); chert, argillite, minor sandstone and conglomerate (c); gabbro (g); serpentinite (um)*
v, dark green to black basalt, greenstone, locally pillowed; hyaloclastite; generally weakly metamorphosed
c, grey, black, red and green chert and argillite; minor chert-sandstone and pebble conglomerate
g, medium to coarse-grained gabbro; quartz monzonite; locally rodingite
um, ultramafic rocks, serpentinite; metapyroxenite, dunite; harzburgite

CASSIAR (LAURENTIAN MARGIN)

MID-CRETACEOUS

mKC — **CASSIAR SUITE:** *medium to coarse-grained, equigranular to porphyritic rocks of largely felsic (q) composition; includes minor (?) amounts questionably of more intermediate composition (g) (ca.117-85 Ma)*
g, granodiorite, biotite-muscovite granodiorite, quartz diorite, biotite quartz monzonite, granite (Cassiar Suite)
q, medium to coarse-grained, equigranular to porphyritic (K-feldspar) granite and biotite quartz monzonite; biotite-hornblende quartz monzonite and granodiorite (Cassiar Suite)

UPPER TRIASSIC

TJC — **JONES LAKE - CASSIAR:** *calcareous siltstone and shale, commonly finely cross laminated; dark grey and buff weathering, recessive, thin-bedded locally bioclastic limestone and interbedded sandy or silty limestone*

UPPER DEVONIAN TO LOWER MISSISSIPPIAN

DMEcs — **EARN - CASSIAR:** *mainly dark clastic rocks; dark grey, recessive weathering, thin-bedded, black siliceous slate with interbeds and members of quartz-chert greywacke, chert granule grit and chert pebble to cobble conglomerate; may include lenses of intermediate to felsic volcaniclastic rocks*

UPPER SILURIAN TO UPPER DEVONIAN

SDA — **ASKIN:** *platy dolomitic siltstone (s) overlain by dolostone and orthoquartzite (d)*
s, tan, medium grey and locally maroon weathering, light grey, thin bedded to platy dolomitic siltstone, dolomitic fine-grained sandstone and minor silty dolomite (Askin Gp.)
d, medium grey to buff weathering, medium to thick-bedded dolostone, silty and sandy dolostone, limestone; medium to thick-bedded, medium-grained mature orthoquartzite; dolomitized laminated mudstone and dolostone with vugs, birdseye and fenestral cavities (Askin Gp.)

ORDOVICIAN TO DEVONIAN, LOCALLY ?MISSISSIPPIAN

ODRC — **ROAD RIVER - CASSIAR:** *fine-grained, graphitic clastics of dominantly Ordovician and Silurian age, but in places including Upper Silurian and Devonian equivalents*
s, recessive, dark grey to black "sooty" limy or dolomitic thin-bedded to platy graphitic siltstone and fine grained impure quartzite with interbedded graphitic silty shale

UPPER CAMBRIAN AND LOWER ORDOVICIAN

COK — **KECHIKA:** *basinal fine-grained calcareous pelitic strata including thin bedded, lustrous, calcareous, grey slate, phyllite, limestone, minor grey dolostone and dolomitic limestone; quartz-carbonate veins; minor sills and flows of basalt and basaltic tuff; may include Ordovician black slate at top of succession (Kechika)*

LOWER CAMBRIAN

lCR — **ROSELLA:** *resistant, thick-bedded to massive, limestone and argillaceous limestone; local archaeocyathid buildups, trilobite fragments, ooilites, and pisolites; pisolitic massive dolostone and limestone; marble, calc-silicate, calcareous phyllite and minor schist (Rosella)*

NEOPROTEROZOIC TO LOWER CAMBRIAN

PCI — **INGENIKA:** *muscovite-biotite-garnet schist, micaceous quartzite, minor amphibolite and marble (Harvey Gp.)*

LAURENTIAN MARGIN

MID-CRETACEOUS

mKS — **SELWYN SUITE:** *plutonic suite of felsic composition (q) (ca. 115-90 Ma)*
q, equigranular to porphyritic (K-feldspar) biotite hornblende muscovite granite, quartz monzonite and granodiorite; porphyritic biotite hornblende granite with large smoky grey quartz phenocrysts and locally K-feldspar phenocrysts (Selwyn Suite)

MIDDLE TO UPPER TRIASSIC

TJ — **JONES LAKE:** *brown to buff weathering, calcareous fine-grained sandstone, argillite and shale; extensive ripple cross-lamination and bioturbation; massive,light grey weathering, fine crystalline, dark grey limestone; minor orange weathering platy limestone (Jones Lake)*

CARBONIFEROUS TO PERMIAN

CPMC — **MOUNT CHRISTIE:** *burrowed, interbedded greenish grey cherty shale and green shale; thin to medium-bedded, light grey-green to black chert; black siliceous slate and siltstone; minor quartzite, limestone and dolostone; locally abundant, large grey barite nodules (Mount Christie)*

MISSISSIPPIAN

Mkm — **KALZAS:** *thick regionally mappable carbonate horizons; grey and buff weathering, generally thick-bedded to massive, dark grey to black fetid limestone; fine crystalline to cryptocrystalline; commonly bioclastic (Kalzas)*

DEVONIAN AND MISSISSIPPIAN

DME — **EARN:** *complex assemblage of submarine fan and channel deposits, within black siliceous shale and chert (s), and including separated small occurrences of felsic volcanic rocks (v); barite common, and many occurrences of stratiform Pb-Zn*
s, thin-bedded, laminated slate with thin to thickly interbedded fine to medium-grained chert-quartz arenite and wacke; thick members of chert pebble conglomerate; black siliceous siltstone; nodular and bedded barite; rare limestone (Earn Gp., Portrait Lake and Prevost) (may include some Ordovician-Devonian Road River?)
v, massive felsic to intermediate volcanic flows, tuffs and subvolcanic plug(s); locally highly altered; greenish chert and minor black slate; quartz eye quartz-sericite chlorite phyllite; local vesicular or amygdaloidal basalt, locally pillowed

LAURENTIAN MARGIN - SELWYN BASIN

ORDOVICIAN TO LOWER DEVONIAN

ODR — **ROAD RIVER - SELWYN:** *black shale and chert overlain by orange siltstone or buff platy limestone; black, gun-blue, or silvery white weathering black graptolitic shale and black chert; resistant grey weathering, thin to medium-bedded, light grey to black, greenish grey or turquoise chert; minor argillaceous limestone (Road River Gp., Duo Lake and Elmer Creek)*

CAMBRIAN TO SILURIAN

CSM — **MENZIE CREEK:** *lower Paleozoic mostly mafic volcanics, in locally thick accumulations but also of common occurrence as undifferentiated thin scattered members within other units (e.g. COR, ODR); resistant, dark grey weathering, massive, locally pillowed, dark grey-green basalt, tuff and breccia (Menzie Creek)*

UPPER CAMBRIAN AND ORDOVICIAN

COR — **RABBITKETTLE:** *basinal limestone that may locally include older and younger basinal pelitic strata undivided; thin bedded, wavy banded, silty limestone and grey lustrous calcareous phyllite; limestone intraclast breccia and conglomerate; massive to laminated, grey quartzose siltstone and chert and rare black slate; local mafic flows, breccia, and tuff (Rabbitkettle)*

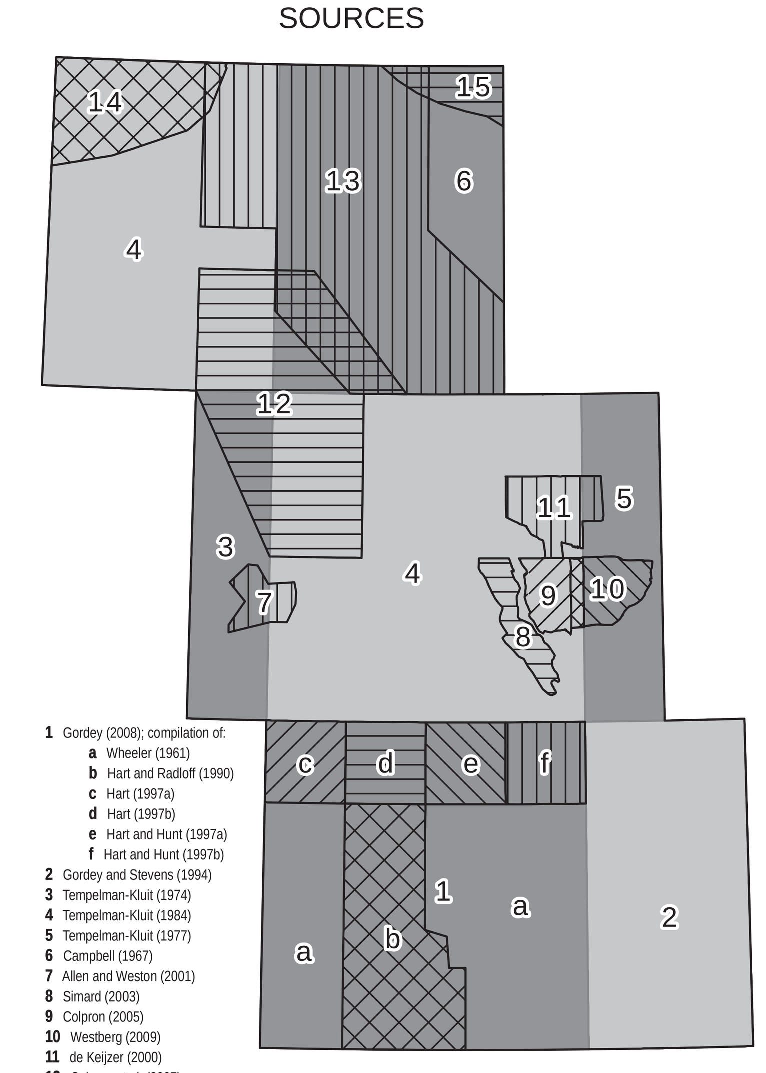
LOWER CAMBRIAN

lCG — **GULL LAKE:** *dominantly fine clastic assemblage; shale, siltstone and mudstone, locally bioturbated, with minor quartz sandstone; rare green-grey chert; local basal limestone and limestone conglomerate; phyllite to quartz-muscovite-biotite schist (garnet sillimanite staurolite andalusite) (Gull Lake)*

NEOPROTEROZOIC TO LOWER CAMBRIAN

PCH — **HYLAND:** *coarse turbiditic clastics (s), minor limestone (Hyland Gp.)*
s, thin to thick-bedded, brown to pale green shale, fine to coarse grained quartz-rich sandstone, grit, and quartz pebble conglomerate; minor argillaceous limestone; phyllite, quartzofeldspathic and micaceous psammite, gritty psammite and minor marble (Hyland Gp., Yusezyu)

SOURCES

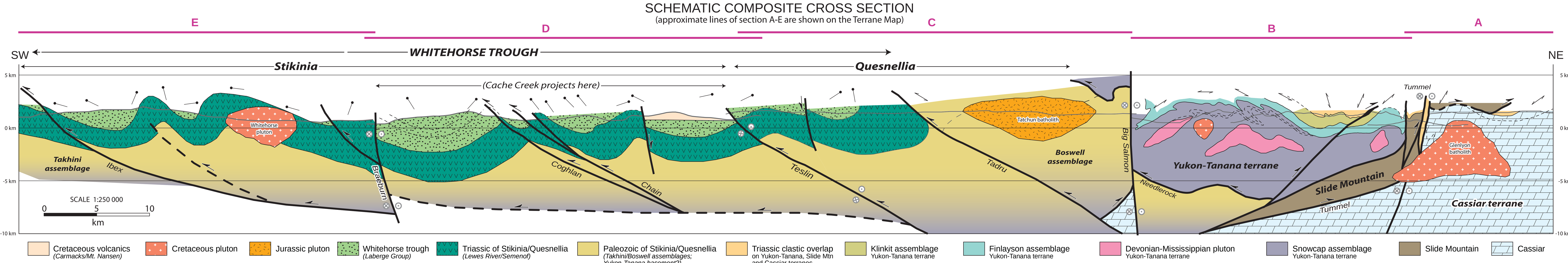


1 Gordey (2008); compilation of:
- a Wheeler (1961)
- b Hart and Radloff (1990)
- c Hart (1997a)
- d Hart (1997b)
- e Hart and Hunt (1997a)
- f Hart and Hunt (1997b)

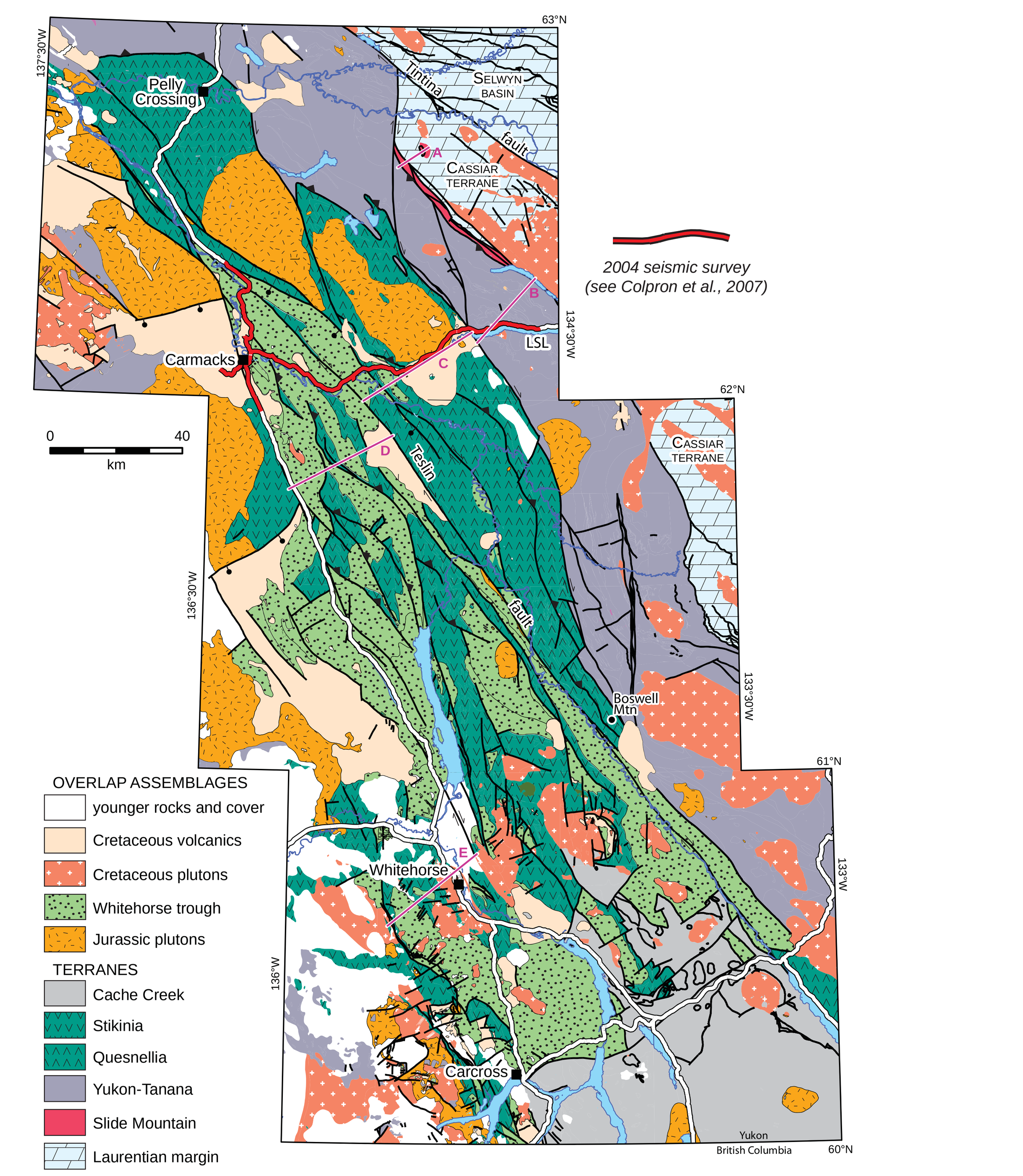
2 Gordey and Stevens (1994)
3 Tempelman-Kluit (1974)
4 Tempelman-Kluit (1984)
5 Tempelman-Kluit (1977)
6 Campbell (1967)
7 Allen and Weston (2001)
8 Simard (2003)
9 Colpron (2005)
10 Westberg (2009)
11 de Keijzer (2000)
12 Colpron et al. (2007)
13 Colpron et al. (2002)
14 Ryan et al. (2010)
15 Gordey and Makepeace (2003)

SCHEMATIC COMPOSITE CROSS SECTION

(approximate lines of section A-E are shown on the Terrane Map)



TERRANE MAP



NOTES

This Geoscience Map report includes this legend and schematic cross-section, three 1:250 000-scale map sheets straddling Whitehorse trough, and an Appendix with geochronological and fossil data tables for each map sheet. A database of Yukon MINFILE occurrences can be accessed online at www.geology.gov.yk.ca.

This compilation presents an integrated structural interpretation of Whitehorse trough in southern Yukon. This new interpretation is anchored in a number of recent detailed maps (see Map Sources) and a seismic reflection survey near Carmacks (see Colpron *et al.*, 2007). These constraints and additional spot checks provided the basis for recompiling the geological information collected during reconnaissance mapping of the Whitehorse trough and surrounding region (Map Sources 1-6).

Usage of Whitehorse trough on these maps differs from the traditional definition (*e.g.* Wheeler, 1961) where it included sedimentary rocks of both the Upper Triassic Lewes River (Aksala formation) and Jurassic Laberge groups. Here we restrict the use of Whitehorse trough to Jurassic rocks of the Laberge Group in recognition that it unconformably overlies strata of the Lewes River Group and marks a change in tectonic and depositional environment (1st order sequence boundary - Lowey, 2004; Lowey *et al.*, 2009). In northern Whitehorse trough, Laberge Group strata locally overlie different parts of the Lewes River Group (Colpron *et al.*, 2007), suggesting an episode of block faulting of Stikinia prior to onset of Laberge deposition. There is also a marked change in depositional environment from shallow-water, arc marginal deposits of the Lewes River Group, to the rapidly subsiding, mainly deltaic to deep-water environments that characterize Laberge Group deposition (Lowey *et al.*, 2009).

REFERENCES

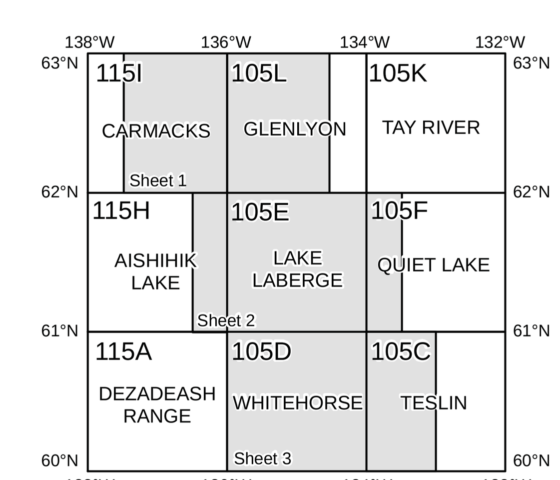
Allen, T.L. and Weston, L.H., 2001. Preliminary geological map of Division Mountain area (105E/5-west half and 115H/8 east half), central Yukon (1:50 000 scale). Yukon Geological Survey, Open File 2001-3.
Campbell, R.B., 1967. Geology of Glenlyon map-area, Yukon Territory (105 L). Geological Survey of Canada, 92 p.
Colpron, M., 2005. Geological map of Livingstone Creek area (NTS 105E/8), Yukon (1:50 000 scale). Yukon Geological Survey, Open File 2005-9.
Colpron, M., Gordey, S.P., Lowey, G.W., White, D. and Piercey, S.J., 2007. Geology of the northern Whitehorse trough, Yukon (NTS 105E/12, 13, and parts of 11 and 14; 105L/4 and parts of 3 and 5; parts of 115H/9 and 16; 115I/1 and part of 8) (1:150 000 scale). Yukon Geological Survey, Open File 2007-6.
Colpron, M., Murphy, D.C., Nelson, J.L., Roots, C.F., Gladwin, K., Gordey, S.P., Abbott, G. and Lipovsky, P.S., 2002. Preliminary geological map of Glenlyon (105L/1-7,11-14) and northeast Carmacks (115I/9,16) areas, Yukon Territory (1:125 000 scale). Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Open File 2002-9, also Geological Survey of Canada, Open File 1457.
de Keijzer, M., 2000. Tectonic evolution of the Teslin zone and the western Cassiar terrane, northern Canadian Cordillera. Unpublished Ph.D. thesis, University of New Brunswick, 391 p.
Gordey, S.P. (comp.), 2008. Bedrock geology, Whitehorse (105D), Yukon. Geological Survey of Canada, Open File 5640, 1:250 000.
Gordey, S.P. and Makepeace, A.J. (comp.), 2001. Bedrock geology, Yukon Territory. Geological Survey of Canada, Open File 3754, 1:1 000 000, also: Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 2001-1.
Gordey, S.P. and Makepeace, A.J. (comp.), 2003. Yukon digital geology (version 2). Geological Survey of Canada, Open File 1749, also Yukon Geological Survey, Open File 2003-9(D).
Gordey, S.P. and Stevens, R.A., 1994. Geology, Teslin, Yukon Territory. Geological Survey of Canada, Open File 2886, 1:250 000.
Hart, C.J.R., 1997a. Geology of Thirty-Seven Mile Creek map area, southern Yukon (105D/13). Yukon Geological Survey, Geoscience Map 1997-4, 1:50 000.
Hart, C.J.R., 1997b. Geology of Upper Laberge map area, southern Yukon (105D/14). Yukon Geological Survey, Geoscience Map 1997-5, 1:50 000.
Hart, C.J.R. and Hunt, J.A., 1997a. Geology of Joe Mountain map area, southern Yukon (105D/15). Yukon Geological Survey, Geoscience Map 1997-6, 1:50 000.
Hart, C.J.R. and Hunt, J.A., 1997b. Geology of Mount M'Clintock map area, southern Yukon (105D/16). Yukon Geological Survey, Geoscience Map 1997-7, 1:50 000.
Hart, C.J.R. and Radloff, J.K., 1990. Geology of Whitehorse, Alligator Lake, Fenwick Creek, Carcross and part of Robinson Map areas (105D/11, 6, 3, 2 & 7). Yukon Geological Survey, Open File 1990-4, 1:50 000.
Lowey, G.W., 2004. Preliminary lithostratigraphy of the Laberge Group (Jurassic), south-central Yukon: Implications concerning the petroleum potential of the Whitehorse Trough. In: Yukon Exploration and Geology 2003, D.S. Emond and L.L. Lewis (eds.), Yukon Geological Survey, p. 129-142.
Lowey, G.W., Long, D.G.F., Fowler, M.G., Sweet, A.R. and Orchard, M.J., 2009. Petroleum source rock potential of Whitehorse trough: a frontier basin in south-central Yukon. Bulletin of Canadian Petroleum Geology, vol. 57, p. 350-386.
Ryan, J.J., Colpron, M. and Hayward, N., 2010. Geology, southwestern McQuesten and parts of northern Carmacks, Yukon. Geological Survey of Canada, Canadian Geoscience Map 7 (preliminary version), 1:125 000.
Simard, R.-L., 2003. Geological map of southern Semenof Hills (part of NTS 105E/1,7,8), south-central Yukon (1:50 000 scale). Yukon Geological Survey, Open File 2003-12.
Tempelman-Kluit, D.J., 1974. Geology, Aishihik Lake, Yukon. Geological Survey of Canada, Preliminary Map 17-1973.
Tempelman-Kluit, D.J., 1977. Quiet Lake (105F) and Finlayson Lake (105G) map areas, Yukon Territory. Geological Survey of Canada, Open File 486, 1:250 000.
Tempelman-Kluit, D.J., 1984. Geology, Laberge (105E) and Carmacks (105I), Yukon Territory. Geological Survey of Canada, Open File 1101, 1:250 000.
Westberg, E., 2009. Geological map of the 'Mendocina Creek' area (parts of 105E/8 and 105F/5) (1:50 000 scale). Yukon Geological Survey, Open File 2009-44.
Wheeler, J.O., 1961. Whitehorse map-area, Yukon Territory, 105D. Geological Survey of Canada, Memoir 312, 156 p.

Digital cartography and drafting by Maurice Colpron and Elizabeth Westberg, Yukon Geological Survey. Assistance in data compilation was provided by Lauren Blackburn, Sydney van Loon, and Bailey Staffen. Thanks to Lee Pigage, Don Murphy and Steve Israel (Yukon Geological Survey), and Charlie Roots (Geological Survey of Canada) for comments on earlier versions of these maps. A thorough review by Steve Gordey (Geological Survey of Canada) has helped improved the maps and supporting elements. Karen MacFarlane (Yukon Geological Survey) provided the final editorial review of this compilation.

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

Paper copies of this map, accompanying reports and Yukon MINFILE may be obtained from Geoscience Information and Sales, Yukon Geological Survey, Energy, Mines and Resources, Yukon Government, Room 102 - 300 Main St., Whitehorse, Yukon, Y1A 2B5. Ph. 867-667-3201, Fx. 867-667-3198, Email: geosales@gov.yk.ca.

A digital PDF (portable document file) file of this map may be downloaded free of charge from the Yukon Geological Survey website: http://www.geology.gov.yk.ca.



Yukon Geological Survey
Energy, Mines and Resources
Government of Yukon

Geoscience Map 2011-1

Geological compilation of Whitehorse trough

Legend and Cross Section

compiled by
Maurice Colpron

RECOMMENDED CITATION
COLPRON, M. (comp.), 2011. Geological compilation of Whitehorse trough - Whitehorse (105D), Lake Laberge (105E), and part of Carmacks (115I), Glenlyon (105L), Aishihik Lake (115H), Quiet Lake (105F) and Teslin (105C) (1:250 000 scale). Yukon Geological Survey, Geoscience Map 2011-1, 3 maps, legend and appendices.

Yukon
Energy, Mines and Resources