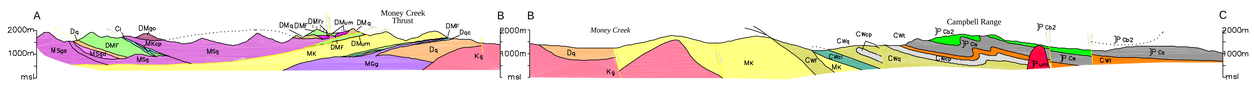
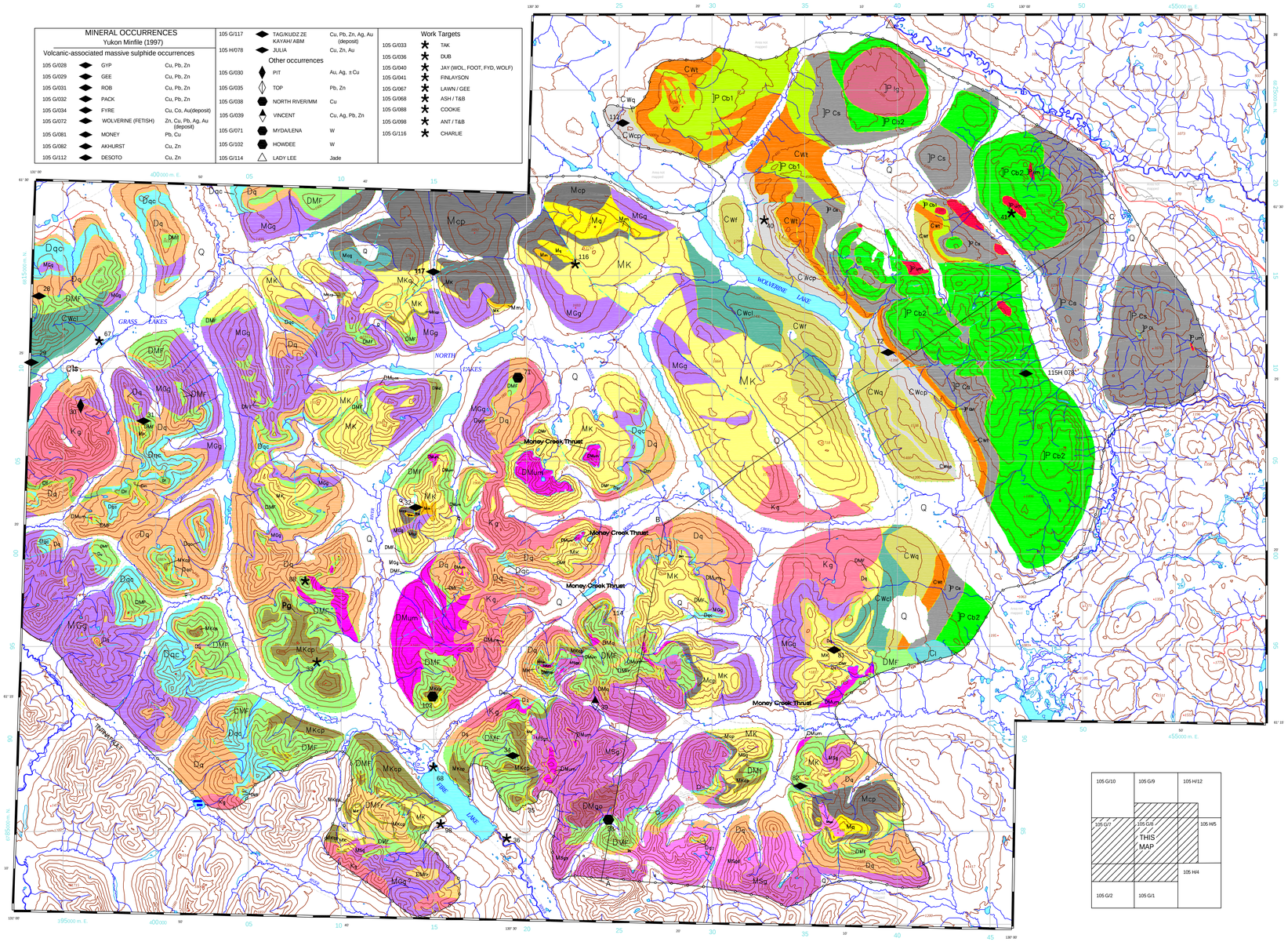


Canada



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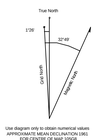
FIVE THOUSAND METRE
Universal Transverse Mercator Grid
ZONE 9

Parts of FINLAYSON LAKE and FRANCES LAKE areas

YUKON TERRITORY
SCALE 1:100 000

Miles 2 0 2 4 6 Miles

Metres 2000 0 2000 4000 6000 8000 Metres



Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION 1861
FOR CENTRE OF MAP 105G/8
Annual change decreasing 2.9'

CONTOUR INTERVAL 100m
Except in 105 G/9 where 500 feet
North American Datum 1983
Transverse Mercator Projection

QUATERNARY

Q	Unconsolidated alluvium, colluvium, lacustrine and glacial deposits
Qls	Landslide

INTRUSIVE ROCKS

CRETACEOUS[1]

Kg	Weakly foliated, medium- to coarse-grained biotite-muscovite granite, generally equigranular

PERMIAN

Pg	Rare, tan to white foliated granitic dykes

PENNSYLVANIAN to PERMIAN

PIg	Whitish-green leucogabbro
PIum	Brown-weathering, dark green to black, variably serpentinized ultramafic rock. Intrusive contacts are locally preserved.

MISSISSIPPIAN[2, 3]

SIMPSON RANGE PLUTONIC SUITE

MSg	Generally unfoliated biotite-hornblende granite and quartz monzonite, locally faulted, chloritized and hematized
MSgs	Strongly foliated and lineated mylonitic MSg.
MSgd	Hornblende granodiorite, locally faulted, chloritized and hematized. Intruded by MSg.

GRASS LAKES PLUTONIC SUITE

MGg	Strongly foliated and lineated medium- to coarse-grained granitic to monzonitic metaplutonic rock. Generally equigranular although augen texture locally present. Locally discordant with earliest foliation.

DEVONIAN to MISSISSIPPIAN[4]

DMq	Mafic-poor quartz porphyritic granite. Cross-cutting relationships between granite and subvolcanic feeder dykes to DMF basalt flows suggests that granite and basalt are coeval and that granite is likely coeval with unit DMFr. Intruded by MSg.
DMum	Brown-weathering, dark green to black, variably serpentinized ultramafic rock. Gabbro (DMgo) and/or pyroxenite locally present. In both hangingwall and footwall of the Money Creek Thrust, the unit is generally spatially associated, and inferred to be in intrusive contact, with DMF. In the footwall, the unit is also locally surrounded by unit DMq, also presumably with intrusive contacts. The unit locally occurs as isolated klippe of the Money Creek Thrust sheet and along the Money Creek Thrust itself as light-coloured fish-scale talc-serpentine schist.
DMgo	
DMd	Foliated coarse-grained hornblende-biotite meta-diorite.[5]

LAYERED ROCKS

PENNSYLVANIAN to PERMIAN (and possibly younger)[6]

CAMPBELL RANGE SUCCESSION

PIcb2	Coarse basaltic breccia, pillowed and massive basaltic lavas, gabbro, diabase, maroon and green chert. Foliated and tightly folded at eastern edge of Campbell Range Belt.
PIcs	Carbonaceous argillite, sandstone and grey quartz grit; diamictite; top is marked by several metres of green, possibly tuffaceous chert and cherty argillite. These strata pass to the northeast into varicoloured chert and argillite, chert-pebble conglomerate and Pennsylvanian limestone (PIcl possibly as olistoliths in conglomerate.
PIcl	
PIcb1	Coarse basaltic breccia, pillowed and massive basaltic lavas, gabbro, diabase, maroon and green chert. Foliated and tightly folded at eastern edge of Campbell Range Belt.

CARBONIFEROUS

WOLVERINE LAKE SUCCESSION

CWt	Thinly interbedded (cm-scale), massive to granular siliceous rock and light-coloured phyllite (metatuff and exhalite). Siliceous rock is pale-coloured, locally massive and bedded on metre-scale at base where associated with baritic iron formation. Darker near top where intercalated phyllite is dark grey. One band of platy brown limestone (CWl) was found in upper part of unit.
CWl	
CWcp	Carbonaceous phyllite and quartz sandstone with black glassy quartz grains. Includes some siliceous phyllite and quartz-feldspar augen phyllite of volcanic or subvolcanic intrusive protolith.
CWf / CWq	Tan to grey muscovite-quartz phyllite (CWf) and quartz-feldspar augen phyllite (CWq) of felsic volcanic and subvolcanic intrusive protolith.
CWcl	Salt and pepper grey to dark grey coarse feldspathic meta-sandstone and grit. Shale chips are common locally.

UNCONFORMITY

MISSISSIPPIAN[7]

GRASS LAKES SUCCESSION

Mcp	Carbonaceous phyllite and quartzite, minor quartzofeldspathic psammite.
Mm	Biotite-chlorite schist.[8]
Mq	Tan, white, mottled quartzite.
Mcg	Feldspar-blue quartz pebble conglomerate.
MK	Kudz Ze Kayah felsic metavolcanic unit: undifferentiated feldspar-muscovite-quartz schist, feldspar and less commonly quartz augen schist (MKq). Carbonaceous phyllite (MKcp) locally important. Magnetite iron formation locally occurs near top of unit in carbonaceous phyllite and thin felsic schist.
MKq	
MKcp	

DEVONIAN to EARLY MISSISSIPPIAN

Cl	In Money Creek Thrust sheet, medium grey to white, massive to foliated limestone, locally with crinoid and other fossil fragments.[9]
DMF	Fire Lake mafic metavolcanic unit: In the footwall of the Money Creek Thrust, the unit comprises massive to subtly layered biotite-plagioclase-actinolite-chlorite schist, and lesser carbonaceous phyllite and quartzite and grey marble. Southwest of Fire Lake and in core at the Fyre Lake deposit, the unit contains quartz-rich schist of probably volcanic or volcaniclastic protolith (DMFr). In the Money Creek Thrust sheet, in a large roof pendant of MSg, unit is tilted but essentially undeformed. In this setting, it comprises massive to pillowed basalt, maroon and green fragmental basalt, pink and green shale and cherty shale, tan greywacke and a middle member of pink to brown locally quartz-porphyritic rhyolite (DMFr). Cross-cutting relationships between dykes feeding basalt and dykes of DMq feeding unit DMum indicate that they are coeval. Outside of the pendant, the unit is foliated and lineated, and contains mappable bands of carbonaceous phyllite and quartzite, pale green chert and grey marble (DMFcp).
DMFr	
DMFcp	
Dq	Biotite-muscovite-feldspar-quartz schist, micaceous quartzite and psammite, quartz-biotite-muscovite ±metapelitic schist, and marble. Marble is locally thick and continuous enough to map as a separate member (Dqc). Biotite-plagioclase-actinolite-chlorite schist (Dm) and feldspar-muscovite-quartz schist of probable volcanic protolith (Df) occur locally.
Dqc	
Dm	
Df	

SYMBOLS

Geological contact (defined, approximate, assumed under cover).....

Fault, displacement unknown (defined, approximate, assumed under cover).....

Fault, reverse (teeth on hanging wall) (defined, approximate, assumed under cover).....

Fault, normal (ball on downthrown hanging wall) (defined, approximate, assumed under cover).....

Limit of Mapping.....

Limit of Outcrop.....

Line of cross-section..... A B

[1] ca. 112 Ma U-Pb age determinations reported from similar bodies elsewhere in the Pelly Mountains (Mortensen, 1992 and personal communication, 1996)
[2] Mortensen, 1992 and personal communications, 1996-1999;
[3] Grant, Creaser and Erdmer (1996); Grant (1997)
[4] Mortensen (1991)
[5] Concordant 365 Ma U-Pb age (J. Mortensen, personal communication, 1996)
[6] Mid-Pennsylvanian to Early Permian, based on radiolarians identified by Tekla Harms as reported in Plint and Gordon (1997)
[7] Tempelman-Kluit (1979)
[8] Mineral modifiers are listed in order of increasing abundance.
[9] Based on conodonts collected by Derek Rhodes, Cominco Ltd. and identified by Mike Orchard, GSC (Report No. MJO-1997-14) Hunt and Roddick (1992)

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Digital Cartography by Jason Adams and Kaori Torigai

REFERENCES

GRANT, S., 1997. Geochemical, radiogenic tracer isotopic, and U-Pb geochronological studies of Yukon Tanana terrane rocks from the Money klippe, southeastern Yukon. Unpublished M.Sc. thesis, University of Alberta, 174 p.
GRANT, S., CREASER, R., and ERDMER, P., 1996. Isotopic, geochemical, and kinematic studies of the Yukon-Tanana terrane in the Money Klippe, SE Yukon. In Cook, F. and Erdmer, P. (eds.) Lithoprobe Slave-Northern Cordilleran Lithospheric Evolution (SNORCLE) Transect Meeting, Report No. 50, p. 58-60.
MORTENSEN, J.K., 1991. New U-Pb ages for the Slide Mountain Terrane in southeastern Yukon Territory. In Radiogenic Age and Isotopic Studies: Report 5, Geological Survey of Canada, Paper 91-2, p. 167-173.
MORTENSEN, J.K., 1992. Pre-mid-Mesozoic tectonic evolution of the Yukon-Tanana Terrane, Yukon and Alaska. Tectonics, v. 11, p. 836-853.
PLINT, H.E. and GORDON, T.M.,1997. The Slide Mountain Terrane and the structural evolution of the Finlayson Lake Fault Zone, southeastern Yukon. Canadian Journal of Earth Science, v. 34, p. 105-126.
TEMPELMAN-KLUIT, D.J., 1979. Transported cataclasite, ophiolite and granodiorite in Yukon Territory: evidence of arc-continent collision. Geological Survey of Canada, Paper 79-14.
Yukon Minfile. Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada. Also available from Hyperborean Productions, Whitehorse, Yukon.

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Keep this map in a dark area to keep colours from fading.

Indian and Northern Affairs Canada
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Yukon Region

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Geological map of parts of Finlayson Lake (105G/7, 8 and parts of 1, 2, and 9) and Frances Lake (parts of 105H/5 and 12) map areas, southeastern Yukon (1:100 000-scale)

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