

LEGEND

EARLY CRETACEOUS
Arniv-Cassiar Plutonic Suite
KACsg massive to foliated, dun-weathering, green serpenitized ultramafic rock and lesser foliated granodiorite and granite
 U/Pb zircon dates range from 100.8 ± 2.3 to 106.4 ± 0.4 Ma (Heffernan, 2004).

INTRUSIVE ROCKS

YUKON-TANANA TERRANE
CLEAVE LAKE THRUST SHEET
LATE DEVONIAN
Klata Metamorphic Complex (Devine, 2005)
DkMam massive to foliated, dun-weathering, green serpenitized ultramafic rock and lesser foliated greenish white leucogabbro
 A 360 ± 10 Ma U-Pb zircon date has been obtained from leucogabbro of this unit in southern Frances Lake map area (Devine, 2005).

MONEY CREEK THRUST SHEET
EARLY MISSISSIPPIAN
Simpson Range Plutonic Suite
Msg weakly to strongly foliated, salmon-colored to grey, medium-grained biotite-hornblende granite to granodiorite
 Early Mississippian U-Pb ages have been determined for plutons of this suite elsewhere (Mortensen, 1992; Murphy et al., in press).

BIG CAMPBELL THRUST SHEET
LATE DEVONIAN
Dm grey, massive, medium-grained leuco-amphibole (meta-gabbro) and lesser dark green amphibolite (meta-pyroxenite)
Dm massive to foliated, dun-weathering, green to black serpenitized ultramafic rock

CENOZOIC
TQsb undifferentiated Holocene basalt and Eocene sedimentary rocks
Eocene
Ebg brown-weathering, greenish black basalt, locally associated with gabbro (not differentiated)

LAYERED ROCKS

YUKON-TANANA TERRANE
CLEAVE LAKE THRUST SHEET
UPPER ORDOVICIAN? SILURIAN(?) OR DEVONIAN(?)
Klata Metamorphic Complex (Devine, 2005)
SDu coarse-grained metamorphic rocks contained as blocks within serpenitized ultramafic rocks (unit DKMam)
 Rock types include variably carbonaceous quartz-muscovite schist and garnet and omphacite-bearing metabasite. Detrital zircons extracted from metabasite rocks are as young as Early Ordovician. U-Pb dating on metamorphic zircon and Ar-Ar dating on retrograde muscovite indicate that prograde metamorphism and uplift occurred at ca. 354 Ma (Devine, 2005).

MONEY CREEK THRUST SHEET
LOWER PERMIAN
Money Creek Formation
 undifferentiated medium to dark grey carbonaceous phyllite, grey and lesser green and pink chert; grey quartzite and mottled grey-white chert-pebble conglomerate, chert-quartz and grit
Pu
 massive to thickly bedded, light to medium grey, light grey-weathering, locally crinoidal limestone
PPr
 massive to thickly bedded, dark grey argillite, chloritic phyllite (matric to intermediate meta-volcanic rocks)

PENNSYLVANIAN-LOWER PERMIAN
Finlayson Creek Limestone
PPr massive to thickly bedded, light to medium grey, light grey-weathering, locally crinoidal limestone
 Pennsylvanian to Early Permian conodonts have been extracted from this unit elsewhere (Murphy et al., in press; Orchard, in press).

UPPER MISSISSIPPIAN-PENNSYLVANIAN
Pu undifferentiated King Arctic and White Lake formations

PENNSYLVANIAN
King Arctic Formation (Devine, 2005)
Pxa undifferentiated green to pale grey, fine- to medium-grained lithic arenite, quartz wacke and chert-pebble conglomerate, dark grey argillite, chloritic phyllite (matric to intermediate meta-volcanic rocks)

UPPER MISSISSIPPIAN-LOWER PENNSYLVANIAN
White Lake Formation (Devine, 2005)
MPW undifferentiated green and locally pink, locally magmatite-bearing chert, fine-grained lithic wacke and siltstone, and white to grey locally sandy and crinoidal limestone
 Greenstone, dark phyllite and limestone and chert-pebble conglomerate occur locally
 Conodonts of Serpukhovian age have been extracted from this unit elsewhere (Murphy et al., in press; Orchard, in press).

UPPER MISSISSIPPIAN
Whitfish Limestone
MWf massive to thickly bedded, light to medium grey, light grey-weathering, locally crinoidal limestone
 Conodonts of Serpukhovian age have been extracted from this unit elsewhere (Murphy et al., in press; Orchard, in press).

LOWER MISSISSIPPIAN
Tuchitua River Formation
Mt variably foliated and massive, pale green, tan and maroon crystal-litic buff tetracite, massive stastochite-green quartz- and feldspar-phyric meta-typhite; local accumulations of green chert and phyllite-clast conglomerate and grit near base
 Early Mississippian U-Pb ages have been determined for this unit elsewhere (Mortensen, 1992; Murphy et al., in press).

UPPER DEVONIAN
Waters Creek Formation
Dw siliceous muscovite-quartz schist or phyllite (felsic metavolcanic rock) and lesser chloritic schist or phyllite (intermediate to mafic metavolcanic rock) intercalated with carbonaceous phyllite; massive to ribbon-bedded, green, white and salmon siliceous rock (meta-chert) at top
 A member of quartzite and quartz-pebble meta-conglomerate occurs near the middle of the succession.

BIG CAMPBELL THRUST SHEET
LOWER MISSISSIPPIAN
Wolverine Lake Group
Mw quartzofeldspathic grit and pebble meta-conglomerate; lesser carbonaceous phyllite; rare meta-typhite, locally argillaceous
 Early Mississippian U-Pb dates have been determined for this unit elsewhere (Mortensen, 1992; Murphy et al., in press).

UPPER DEVONIAN
Kutz Za Kuyah Formation
Dk undifferentiated foliated feldspar-muscovite-quartz schist or phyllite, massive pale siliceous muscovite-quartz schist or phyllite, locally with quartz amygdalites, feldspar and rarely quartz-agen schist or phyllite (meta-porphyr); interbeds of carbonaceous phyllite are common
DKcp carbonaceous phyllite and grey quartzite
Dr massive to subtly layered, plagioclase-chlorite phyllite or schist, locally with biotite and actinolite porphyroblasts; lesser carbonaceous phyllite
Drf tan muscovite-quartz phyllite or schist (felsic metavolcanic rock) and potassium feldspar-muscovite-quartz augen phyllite or schist (meta-porphyr); locally rusty and pyritic

SLIDE MOUNTAIN TERRANE
UPPER MIDDLE-UPPER PERMIAN
Simpson Lake Group
Ps red-brown to pale green matrix- and framework-supported polyimite conglomerate, pale green sandstone, dark grey siltstone and shale, basalt and felsic volcanic rocks
 Conglomerate clasts include porphyritic basalt, aphyric massive basalt, chloritic phyllite, quartzitic phyllite, siliceous carbonaceous phyllite, carbonate, white quartz, chert, serpenitine, blueschist and eclogite (Mortensen et al., 1999; Murphy et al., in press; Middle to Late Permian U/Pb zircon ages have been determined for felsic volcanic rocks of this unit (Mortensen et al., 1999)).

CARBONIFEROUS (AND OLDER?) PERMIAN
Form Creek Group
CP variably foliated, matrix green and grey, ribbon-bedded to massive chert; medium to dark grey and lesser green and pink shale or phyllite; quartzofeldspathic sandstone, grit and conglomerate and chert-quartz sandstone, grit and conglomerate

NORTH AMERICAN CONTINENTAL MARGIN SEQUENCE
MIDDLE-UPPER TRIASSIC
Jones Lake Formation (Gorday and Anderson, 1993)
JLs dark brown- and grey-weathering, greenish-brown to grey, detrital mica-bearing calcareous shale, siltstone, sandstone and siltstone

UPPER DEVONIAN-LOWER MISSISSIPPIAN
Earm Group
DMe dark grey- black- and rusty-weathering non-calcareous shale, siltstone, quartz and chert wacke, and minor chert-pebble conglomerate (Abbott, 1977, 1981)
SDu undifferentiated dolomite, dolomitic siltstone, dolomitic quartzite and orthoquartzite

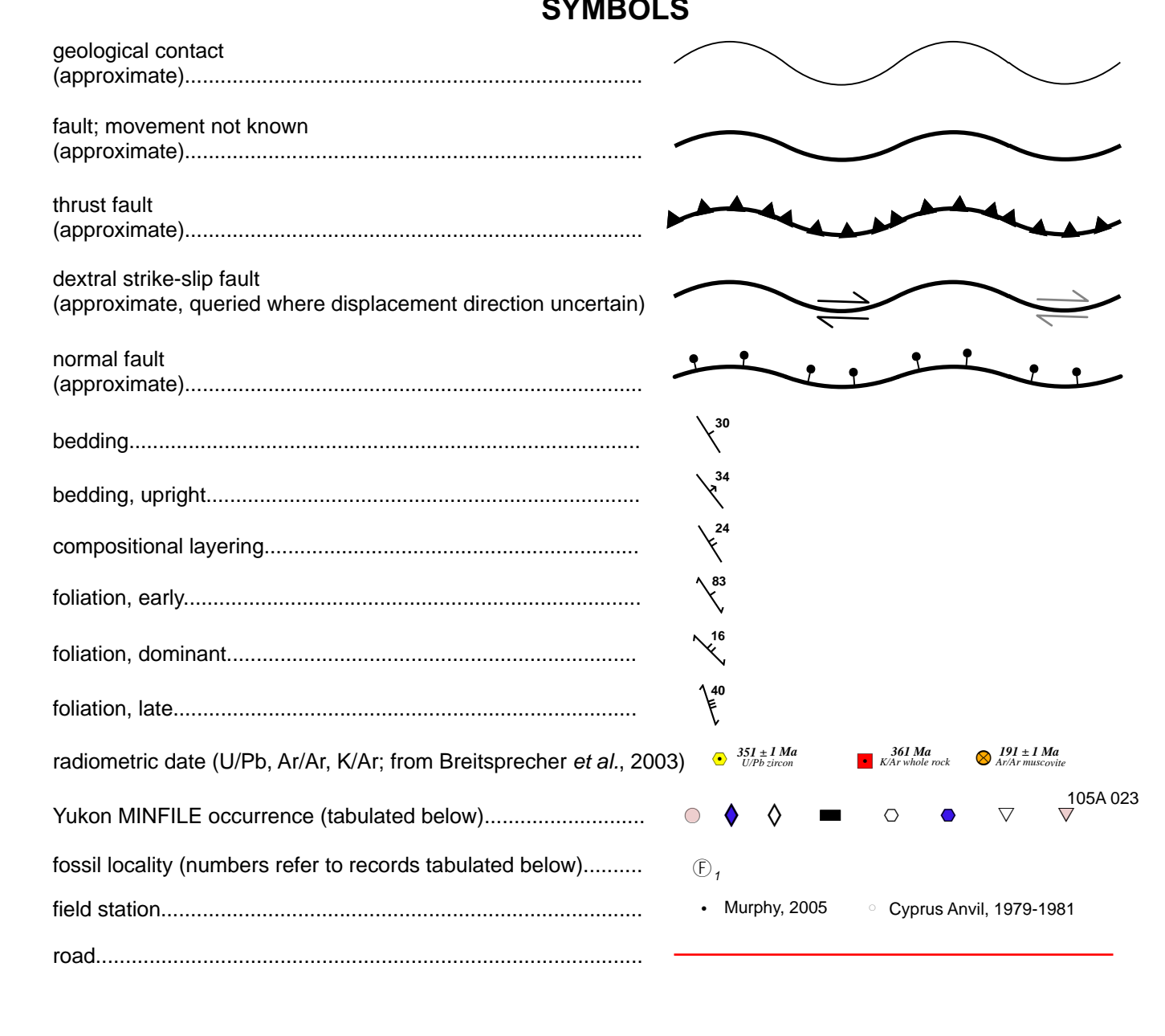
UPPER SILURIAN(?)-LOWER DEVONIAN
SDc dark grey, hard, platy limestone; thick-bedded, buff-weathering sandy dolomite; dolomitic quartzite (Abbott, 1977, 1981)
 Unit may be in part equivalent to Sandpile Formation of Gabrielse (1998).

SILURIAN
Ss thinly laminated, brown, grey, and buff-weathering calcareous or dolomitic siltstone, silty dolomite, dolomite (Abbott, 1977, 1981)
 May be in part equivalent to Sandpile Formation of Gabrielse (1998).
Sc massive, resistant, blue-grey orthoquartzite occurring as lenses within dolomitic siltstone or unit near its base (Abbott, 1977, 1981)
 Unit may be lateral facies equivalent of the Ramhorn Formation of Gabrielse (1998).

UPPER CAMBRIAN-LOWER ORDOVICIAN
COsl undifferentiated thinly laminated or nodular, calcareous grey and brown phyllite and silt limestone; thinly laminated green and purple calc-alicaceous tortholite (Abbott, 1977, 1981)
 Unit is transitional lithologically between time-equivalent Rabbinkette and Keckcha formations of Selwyn Basin and Cassiar Platform, respectively (J.G. Abbott, personal communication, 2005).

LOWER CAMBRIAN
C massive blue-grey, Archeoyathid-bearing limestone occurring as lenses within unit Cs (Abbott, 1977, 1981)
Cs silver, greenish-grey phyllite, brown and grey micaceous and/or calcareous phyllite, black quartzose phyllite, minor greenstone (Abbott, 1977, 1981)

UPPER PROTEROZOIC-LOWER CAMBRIAN
Hyland Group
PCu undifferentiated quartzofeldspathic grit and sandstone, slate, massive siliceous limestone, maroon and green slate



FOSSILS

Map Number	GSC Number	Material	Map Unit	Age Range	Reference
1	C-068289	pollen	TQsb	Late Eocene	Poulton et al. (2003)
2	O-087031	conodonts	TJs	Middle Triassic (Ladinian)	Orchard (in press)
3	O-087032	conodonts	TJs	Middle Triassic (Anisian-Ladinian)	Orchard (in press)
4	O-075640	conodonts	TJs?	Ordovician-Silurian	Poulton et al. (2003)
5	O-093958	conodonts	TJs?	Late Devonian	M.J. Orchard (unpub.)
6	C-303414	conodonts	Ps	Permian	Orchard (in press)
7	C-303415	conodonts	Ps	probably Permian	Orchard (in press)
8	C-102798	conodonts	PPr	Late Carboniferous (Baskirian)	Orchard (in press)
9	C-026571	conodonts	DMe	probably Devonian	Poulton et al. (2003)
10	O-086257	conodonts	DMe	Middle to Late Devonian	M.J. Orchard (unpub.)
11	C-026569	conodonts	SDc	Early Devonian	Poulton et al. (2003)
12	C-026570	conodonts	SDc	Early to Middle Devonian	Poulton et al. (2003)
13	C-116326	conodonts	SDc	Early-early Middle Devonian	M.J. Orchard (unpub.) (late Emsian-early Eifelian)
14	C-026576	graptolites	Ss	Silurian, probably latest (Llandovery or Wenlock)	Abbott (1977)
15	C-026579	graptolites	Ss	Ordovician-Early Devonian	Abbott (1977)
16	C-026578	archoeyathids	CI	Early Cambrian	Abbott (1977)
17	C-026572	archoeyathids	CI	Early Cambrian	Abbott (1977)
18	C-026573	archoeyathids	CI	Early Cambrian	Abbott (1977)
19	C-026574	archoeyathids	CI	Early Cambrian	Abbott (1977)
20	C-026575	archoeyathids	CI	Early Cambrian	Abbott (1977)
21	O-089874	archoeyathids	CI	Early Cambrian	Poulton et al. (2003)

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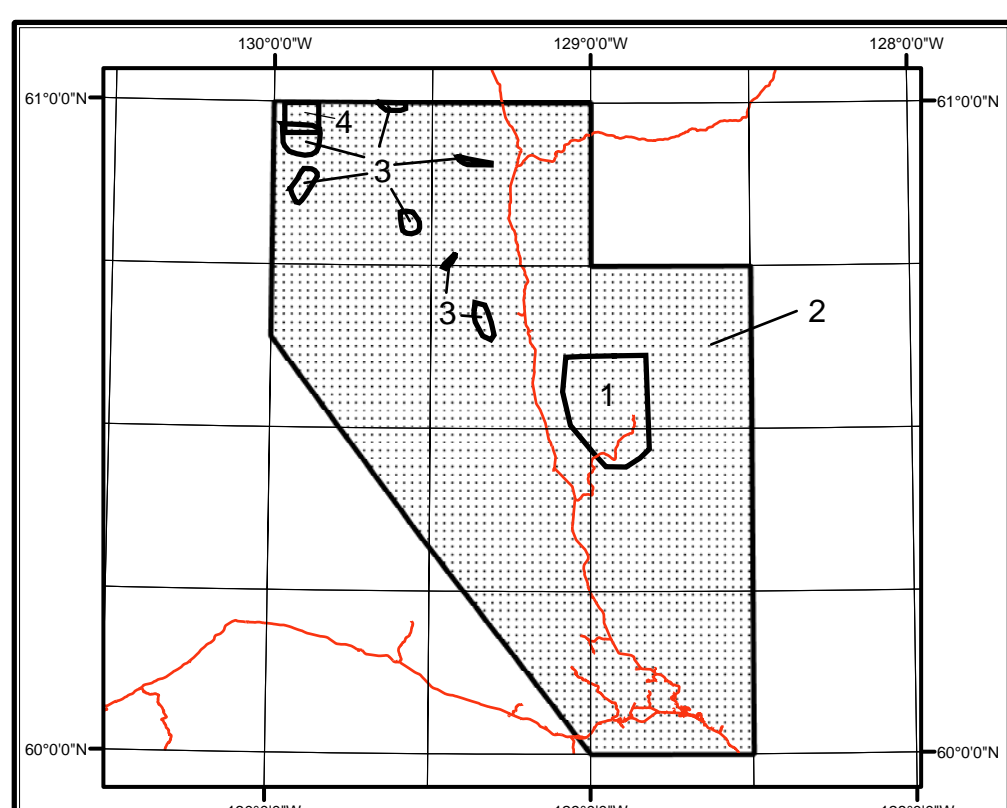
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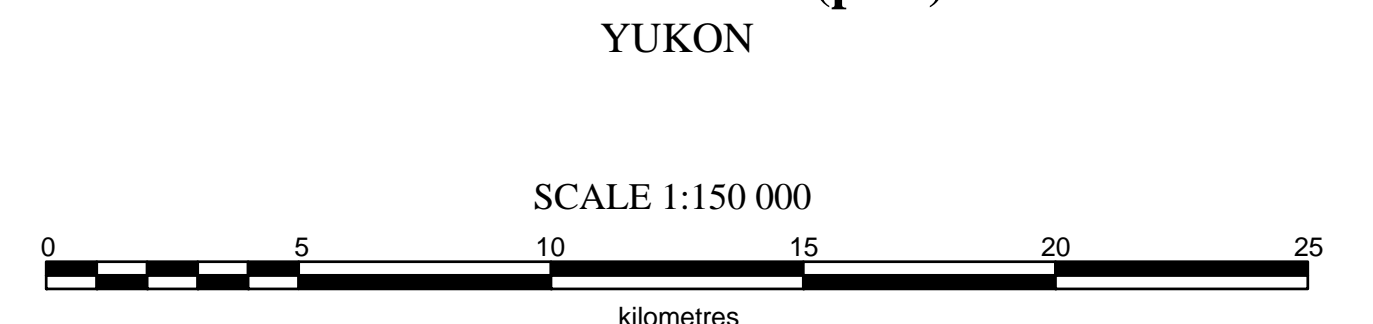


SOURCES OF INFORMATION

- Abbott (1977, 1981)
- Cyprus Anvil Mining Corporation, 1979-1981; J.K. Mortensen, unpublished data
- D. Murphy, 2005 mapping
- T. Liverton, personal communication

This map brings together data from several sources, indicated above. The majority of the data comes from field notes and maps made during the 1979-1981 regional mapping program conducted by a team of geologists from Cyprus Anvil Mining Corporation. Team members included Gregg Jilson, Lee Pigage, Dave Jennings (dec.), and Jim Mortensen. Additional information has been collected since 1981 by Jim Mortensen. Grant Abbott mapped the area around the Sa Denes Hes Mine for his 1977 M.Sc. thesis. Tim Liverton kindly made available his observations from the northwestern corner of the map area. 1:50 000-scale mapping in selected areas was done by Don Murphy in 2005.

BEDROCK GEOLOGY
WATSON LAKE (part)
YUKON



Use diagram only to obtain numerical values
 APPROXIMATE MEAN DECLINATION 2005
 FOR CENTRE OF MAP
 Grid North approximates True North
 throughout much of area.

MINERAL OCCURRENCES
 Yukon MINFILE (Deklerk and Traynor, 2005)

MINFILE #	NAME	STATUS	COMMODITY	DEPOSIT TYPE
105A 004	Windfall	unknown		unknown
105A 005	Watson	drilled prospect	Zn, Pb, Ag	vein
105A 006	Nazo	drilled prospect	Ag, Pb, Zn	vein
105A 007	Carol	drilled prospect	coal	coal
105A 008	Albert	drilled prospect	coal	coal
105A 009	Sawmill	showing	coal	coal
105A 011	Carnegie	anomaly		unknown
105A 012	Sa Denes Hes, Mt. Hundere	underground past producer	Ag, Zn, Pb	skarn
105A 013	Ritco, North Hill, Mt. Hundere, Sa Denes Hes	underground past producer	Pb, Ag, Zn	skarn
105A 014	Ralph	unknown		unknown
105A 015	Simpson, Simpson Lake	unknown		unknown
105A 016	Heisz	unknown		unknown
105A 025	Myrnky	unknown		unknown
105A 031	Plan	unknown		unknown
105A 034	Howard	unknown		unknown
105A 036	Dodo	prospect	coal	coal
105A 037	Middle Canyon	showing	coal	coal
105A 038	Shall	anomaly		unknown
105A 040	Skhill	unknown		unknown
105A 041	Pug	unknown		unknown
105A 043	Glimmer	anomaly		unknown
105A 044	Highway	anomaly		unknown
105A 045	Jewel	unknown		unknown
105A 047	Sambo, Simpson	prospect	Ag, Pb, Cu	Kuroko massive sulphide
105A 048	Ilich	anomaly	Zn	unknown
105A 049	Little Jimmy	showing		volcanogenic massive sulphide

RECOMMENDED CITATION

MORTENSEN, J.K. and MURPHY, D.C. (compilers). 2005. Bedrock geological map of part of Watson Lake area (all or part of NTS 105A/2, 3, 5, 6, 7, 10, 11, 12, 13, 14), southeastern Yukon (1:150 000 scale). Yukon Geological Survey, Open File 2005-10.

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

Paper copies of this map, the accompanying report and Yukon MINFILE may be purchased from Geoscience Information and Sales, c/o Whitehorse Mining Recorder, Energy, Mines and Resources, Yukon Government, Room 102 - 300 Main St., Whitehorse, Yukon, Y1A 2B5, Ph. 867-667-5200, Fax. 867-667-5150, 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

Open File 2005-10
Bedrock geological map of part of Watson Lake area
(all or part of NTS 105A/2, 3, 5, 6, 7, 10, 11, 12, 13, 14),
southeastern Yukon,
(1:150 000 scale)

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