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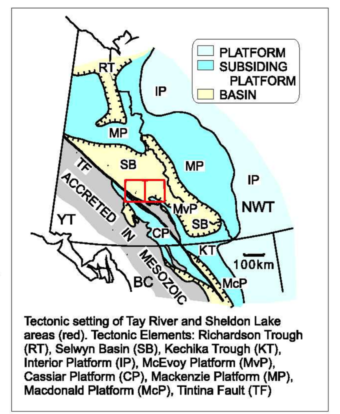
GEOLOGICAL SURVEY OF CANADA   COMMISSION GÉOLOGIQUE DU CANADA

TECTONIC SETTING



Tectonic setting of Tay River and Sheldon Lake areas (red). Tectonic Elements: Richardson Trough (RT), Selwyn Basin (SB), Kechika Trough (KT), Interior Platform (IP), McEvoy Platform (MvP), Cassiar Platform (CP), Mackenzie Platform (MP), Macdonald Platform (McP), Tintina Fault (TF)

This map is one of a set of two 1:250 000 scale Open File maps that describe the geological framework of some 22,975 square kilometres of east-central Yukon (see inset and index maps).

Much of Sheldon Lake and Tay River areas (105J, K) northeast of Tintina Fault is underlain by uppermost Proterozoic and Lower Paleozoic basinal strata (Selwyn Basin) that formed in a re-entrant within shallow water carbonate and clastic strata (Mackenzie Platform) along the outer margin of ancestral North America. The oldest exposed strata consist of latest Proterozoic to Cambrian turbiditic quartz sandstone (PY) and maroon slate (PЄN) (2500+ m thick) succeeded by local Cambrian shale (ЄG) (up to 700 m) capped by a widespread basinal limestone and siltstone of Cambro-Ordovician age (ЄOR) (300 m). A starved sequence of shale, chert and siltstone (OSR) (450 m) with local volcanics (OM) was deposited during Ordovician to Middle Devonian time. Regional sub-Upper Cambrian (ЄOR) and other local unconformities suggest intermittent extension and syn-depositional faulting. In the Silurian and Devonian the basin was flanked on the southwest by shallow water carbonate and clastics of McEvoy Platform (SDc, Ssp) (300+ m). Large stratiform zinc-lead deposits are known in strata of Early Cambrian (Faro) and Early Silurian (Howards Pass, to east of area) age.

In the Late Devonian, turbiditic quartz-chert sandstone, and chert pebble conglomerate were deposited in submarine fan complexes as shale deposition transgressed far northeastward onto the ancestral margin (DME, MC, DMP, DP). The coarse clastics, 1200(?) m in aggregate thickness, were derived from elevated fault blocks of Selwyn Basin strata to the north and west, including latest Proterozoic gritty quartzose clastic rocks and Ordovician-Silurian chert. An extensional or transtensional event is indicated by an absence of compressional deformation, local felsic volcanism (Mv), and widespread stratiform barite (+/- lead-zinc) occurrences (e.g. Tom, Jason to east of area). A regional unconformity occurs beneath upper Upper Devonian strata (DMP).

Succeeding Lower Mississippian and Triassic carbonate and siliciclastic sediments separated by Carboniferous to Permian chert and shale (MT, CPMC, ŦJ) (total 1700 m) were likely deposited on a silty to muddy, at times euxinic, shallow marine shelf. A regional unconformity occurs beneath Middle to Upper Triassic (ŦJ), and possibly beneath Upper Mississippian strata (CPMC).

Rare Lower Cretaceous chert-bearing clastic rocks (KBT) (120+ m), the first signal of Jura-Cretaceous orogenic uplift to the west, disconformably overlie Upper Triassic strata.

Ancestral margin strata southwest of Tintina Fault comprise two distinct successions separated by the northwest trending St. Cyr fault. On the southwest, the Pelly Mountains assemblage (3500 m) consists of relatively deep water, late Proterozoic to Silurian fine clastic and carbonate strata (PЄp, ЄOsl, OSl) succeeded by shallow water, Siluro-Devonian carbonate and clastic rocks (Sst, SDdq; Cassiar Platform), in turn overlain by Devono-Mississippian shale and chert-bearing sandstone (DMs). The Devono-Mississippian strata are analogous in tectonic affinity to the Earn Group (DME) northeast of Tintina Fault. To the south of Tay River map area the succession includes felsic volcanic rocks that host volcanogenic massive sulphide occurrences (e.g. Wolf). Unconformities occur at the base of the Lower Silurian (Sst) and upper Upper Devonian (DMs). In the narrow belt between St. Cyr and Tintina faults, the St. Cyr assemblage (1600+ m) differs from the Pelly Mountains assemblage in the lack of Paleozoic shallow water clastic or carbonate strata, as well as in the presence of a unique and enigmatic unit of Late Devonian limestone-phyllite (DMcsl). Cambro-Ordovician to Devonian strata consist chiefly of fine grained pelitic (ODsl) and carbonate (ЄOc) rocks of probable deep water origin. Scattered remnants of Carboniferous to Triassic strata include chert (Mt), siltstone, carbonate and shale (DMs, Csl, uŦsc) that resemble equivalent strata in adjacent regions southwest of St. Cyr Fault.

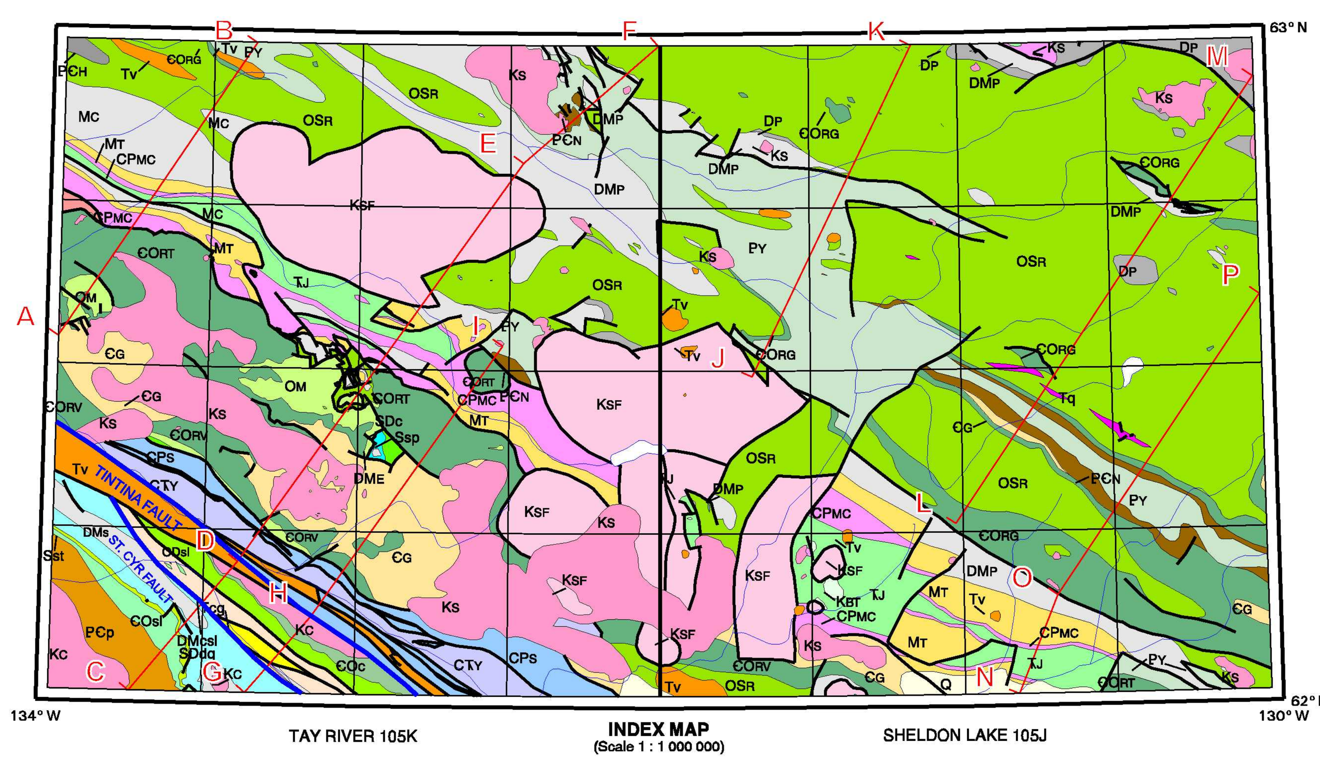
In the Early Cretaceous, northeast-southwest compression led to northwest-trending, regional scale folds and extensive, shallow-dipping thrust faults. Incompetent Ordovician to Devonian shale and chert are complexly deformed above a regional, flat-lying, buried detachment (see cross-sections, sheet 3). Shortening in Cambro-Ordovician to Devonian strata is at least 50%, indicating that the paleogeographic width of the Selwyn Basin was twice as much as is currently represented. Folds and faults ultimately root in a basal detachment that extends beneath the region and across the entire deformed belt. Upper Paleozoic oceanic rocks of the Slide Mountain terrane (CPs), and metasediments of the Yukon-Tanana terrane (CŦY), were emplaced as thrust sheets during this deformation. Deformation is bracketed as younger than affected Early Cretaceous strata (KBT), and older than intrusion of the mid-Cretaceous Selwyn Plutonic Suite (KS) and eruption of dacitic pyroclastics of the coeval South Fork Volcanics (KSF). The plutons are regionally associated with tungsten-copper skarn (e.g. Mactung) and base metal vein occurrences. The volcanics are notably barren.

Cretaceous-Tertiary dextral slip along Tintina Fault zone, which transects the southwest part of the area, amounted to at least 430 km. Pull-apart basins along the fault zone accumulated fluvial clastics (Ts) and bimodal volcanic rocks (Tv) that host epithermal precious metal veins (e.g. Grew Creek).

ACKNOWLEDGMENTS

Excellent field assistance was provided by T. Frakes (1982), D. Thorkelson (1983), B. Thomas (1985, 1986), S. Gareau (1986), S. Irwin (1986), and D. Rhys (1987). During 1986 and 1987, a base camp was shared in Ross River with Lionel Jackson of the Geological Survey, who was mapping surficial geology in Tay River map area. Brian and Colleen Hemsley, proprietors of the Ross River Service Centre, are commended for excellent expediting. Helicopter pilot John Witham (Trans North Turbo Air), skillfully performed many difficult landings that were required in parts of the region. His knowledge of the terrain and of local history were invaluable. Northern Mountain Helicopters provided efficient charter service from Macmillan Pass in 1982, and Danny Perrault gave excellent fixed-wing service from Ross River in 1987. J. Morin, then Chief Geologist, Whitehorse office of Indian and Northern Affairs Canada, encouraged the project, and kindly made available office, mail, and warehouse facilities in Whitehorse. The mapping benefited greatly from friendly and open discussion on the geology of the Anvil Range, its deposits and environs with L. Pigage and G. Jilson (then of Curragh Resources Ltd.).

Charles Roots is thanked for his constructive review.


63° N
62° N
134° W
130° W

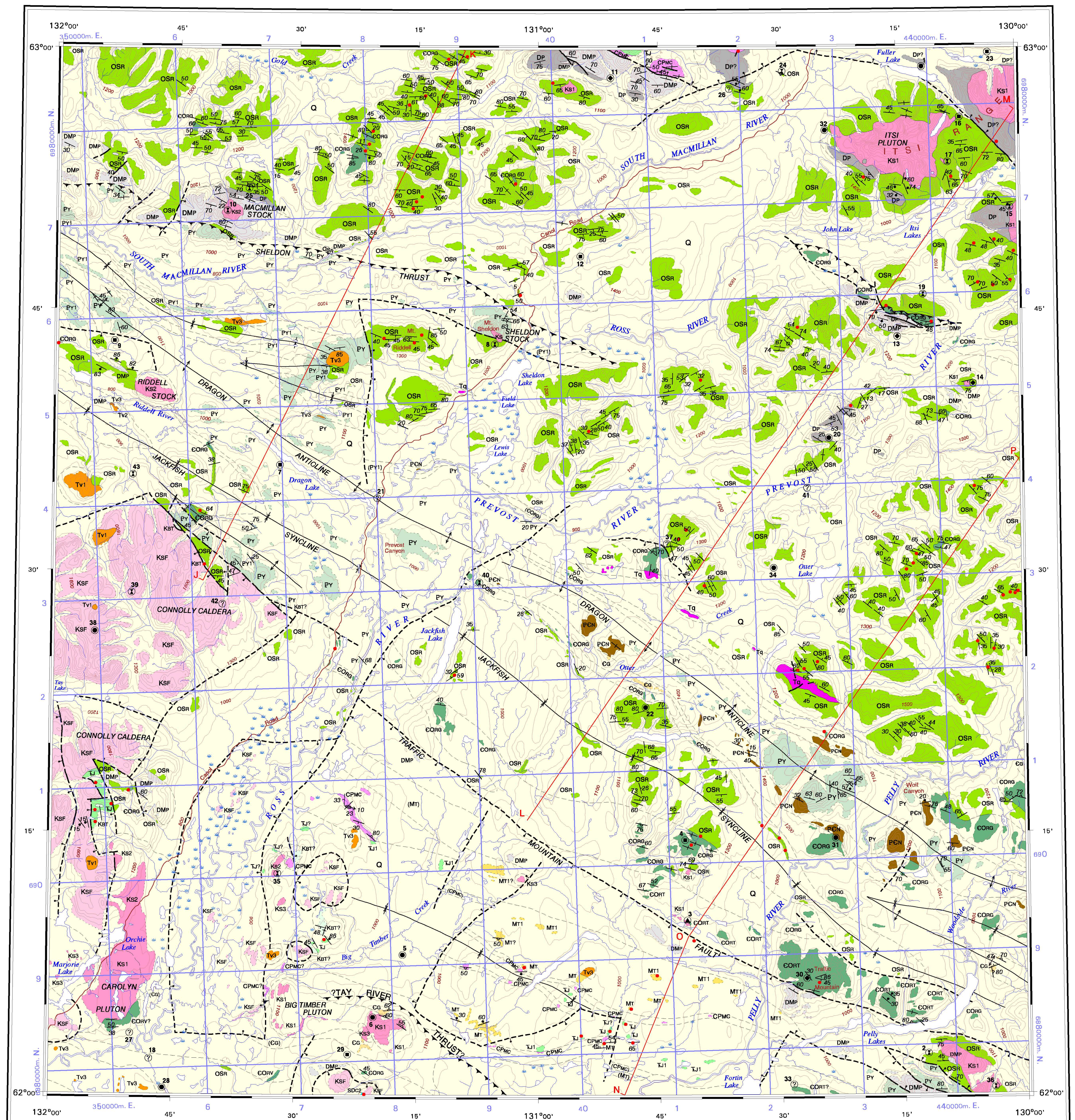
TAY RIVER 105K   **INDEX MAP** (Scale 1 : 1 000 000)   SHELDON LAKE 105J

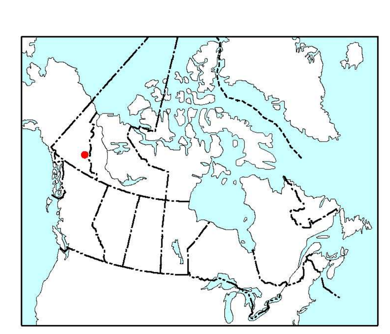
MINERAL PROSPECTS (FROM YUKON MINFILE[2], 2004)

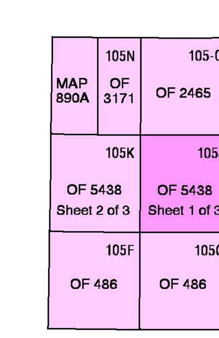
MINFILE[1]	NAME	STATUS	DEPOSIT TYPE	COMMODITY (MAJOR/MINOR/TRACE)
1	FULLER	ANOMALY	UNKNOWN	-/-/-
2	BILL	SHOWING	POLYMETALLIC VEINS AG-PB-ZNAU	Pb + Zn/Cu, Ag/-
3	PIKE	DEPOSIT	CUAG QUARTZ VEINS	Ag, Cu/Pb, Zn, Au/-
4	NORKEN	DRILLED PROSPECT	POLYMETALLIC VEINS AG-PB-ZNAU	Cu, Zn, Pb, Ag/-/-
5	BIG TIMBER	ANOMALY	UNKNOWN	-/-/-
6	TAC	ANOMALY	PORPHYRY MO (LOW F-TYPE)	Cu, Mo/-/-
7	DRAGON	DRILLED PROSPECT	W SKARN	Au, W, Cu, Ag/As, Pb, Ag, Au/-
8	MT SHELDON	SHOWING	UNKNOWN	Cu, W, Sn, Au/As, Bi, Ag, Te, W/-
9	RIDDELL	DRILLED PROSPECT	PB-ZN SKARN	Pb + Zn, Cu/Ag, Au/-
10	SPEARHEAD	SHOWING	POLYMETALLIC VEINS AG-PB-ZNAU	Cu/Au/-
11	IVOR	PROSPECT	SEDIMENTARY EXHALATIVE ZN-PB-AG (SEDEX)	Ag/Au, Cu, Zn/-
12	ROG	DRILLED PROSPECT	SEDIMENTARY EXHALATIVE ZN-PB-AG (SEDEX)	-/Zn/-
13	CLYDE	PROSPECT	SEDIMENTARY EXHALATIVE ZN-PB-AG (SEDEX)	Pb, Zn/Cu, W, Zn/-
14	PREVOST	PROSPECT	W SKARN	W/-/-
15	GUN	SHOWING	PB-ZN SKARN	Zn, Cu/Ba/-
16	ITSI	DRILLED PROSPECT	MANTOS & STOCKWORK SN	Ag, Sn, Zn, Pb/Cu, W, Au/-
17	COSTIN	SHOWING	POLYMETALLIC VEINS AG-PB-ZNAU	Pb, Ag, Zn/Au/-
18	CAROLYN	UNKNOWN	COAL	Coal/-/-
19	VARISCITE	SHOWING	CU SKARN	Cu/-/-
20	MACRAE	ANOMALY	UNKNOWN	-/-/-
21	SYNDICATE	UNKNOWN	UNKNOWN	-/-/-
22	RICH	ANOMALY	UNKNOWN	-/Zn, Pb, Cu, Ba/-
23	PETE	DRILLED PROSPECT	SEDIMENT-HOSTED BARITE	Ba/Pb + Zn/-
24	COCO	SHOWING	SEDIMENT-HOSTED BARITE	Ba/-/-
25	ST GODARD	SHOWING	SEDIMENTARY EXHALATIVE ZN-PB-AG (SEDEX)	Ba/-/-
26	PRISM	UNKNOWN	UNKNOWN	-/-/-
27	MARILYN	UNKNOWN	UNKNOWN	-/-/-
28	BOJO	ANOMALY	UNKNOWN	-/-/-
29	HENCH	DRILLED PROSPECT	PB-ZN SKARN	Pb, Ag, Zn/Cu/-
30	MARYLOU	PROSPECT	PB-ZN SKARN	Ag, Pb, Zn/W, Mo, Cu, Au/-
31	GREGGIE	ANOMALY	UNKNOWN	-/-/-
32	CANOL	ANOMALY	UNKNOWN	-/-/-
33	FORTIN	UNKNOWN	UNKNOWN	Au/-/-
34	DYAK	ANOMALY	SEDIMENTARY EXHALATIVE ZN-PB-AG (SEDEX)	-/-/-
35	SASK	SHOWING	MO SKARN	Mo, Cu/Au, Zn, Pb, Ag/-
36	GULF	SHOWING	W SKARN	W, Cu/-/-
37	RUDY	UNKNOWN	UNKNOWN	-/-/-
38	FLOOD	ANOMALY	EPITHERMAL AU-AG: LOW SULPHIDATION	-/Ag, Au/-
39	WENDY	SHOWING	AU-QUARTZ VEINS	Ag, Au/-/As
40	NARL	SHOWING	PB-ZN SKARN	-/Cu, Pb, Zn/-
41	LIBERAL	UNKNOWN	UNKNOWN	-/-/-
42	PANDORA	UNKNOWN	UNKNOWN	-/-/-
43	VG	SHOWING	AU-QUARTZ VEINS	Ag, Au/-/-

[1] For full MINFILE number, add prefix "105J", or "105J0", or "105J00" as appropriate, e.g. MINFILE 34 - "105J034"

[2] Deklerk, R. and Traynor, S. (compilers), 2005. Yukon MINFILE 2005 - A database of mineral occurrences. Yukon Geological Survey, CD-ROM. (updated March, 2008 from Yukon Minfile online at http://www.geology.gov.yk.ca)




LOCATION MAP


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

OPEN FILE 5438

GEOLOGY

SELWYN BASIN (105J AND 105K) YUKON

SHELDON LAKE (105J)

Scale 1:250 000/Échelle 1/250 000

kilometres 5 0 5 10 15 20 kilomètres

Universal Transverse Mercator Projection
North American Datum 1983

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

Author: S.P. Gordey

Geology by S.P. Gordey, Geological Survey of Canada 1980, 1982-1983, 1985-1987, with contributions from previous work by J.A. Roddick and L.H. Green

Digital cartography by R. Cocking, R. Chan, and S.P. Williams Geological Survey of Canada

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

Digital base map from data compiled by Geomatics Canada, modified by GSC Pacific

Mean magnetic declination 2008, 24°36'E, decreasing 26.3' annually Readings vary from 24°20'E in the SW corner to 24°49'E in the NE corner of the map

Elevations in meters above mean sea level

LEGEND

NOTE: Units projected beneath appear in brackets e.g. (CPMC)

CENOZOIC

PLEISTOCENE AND RECENT

Q — *Unconsolidated glacial and alluvial deposits*

TERTIARY

Tv — *Bimodal Volcanic Unit: undivided* Tv; Tv1, *small stocks and necks of white weathering, flow-banded, rhyolitic, quartz-sanidine porphyry;* Tv2, *laminated rhyolitic ash-flow tuffs and flows;* Tv3, *dark grey weathering, locally amygdaloidal, dark grey-green basalt necks and flows*

TERTIARY?

Tq — *Vein Unit: white weathering, white vein quartz*

MESOZOIC

MID-CRETACEOUS

KSF — *SOUTH FORK VOLCANICS: dark brown weathering, locally columnar jointed, massive, densely welded, biotite-quartz-hornblende-feldspar crystal- and crystal-lithic tuff*

KS — *SELWYN PLUTONIC SUITE: grey weathering, resistant, medium- to coarse-grained, locally megacrystic (K-spar), biotite ± hornblende ± muscovite granite, quartz monzonite and granodiorite;* KS1, *plutons without hornblende;* KS2, *plutons with hornblende;* KS3, *porphyritic biotite-hornblende granite characterized by large smokey grey quartz phenocrysts and locally K-feldspar phenocrysts*

LOWER CRETACEOUS

KBT — *BIG TIMBER FORMATION: chert sandstone and chert- pebble conglomerate*

TRIASSIC

ŦJ — *JONES LAKE FORMATION: brown weathering, medium- to thick-bedded, calcareous siltstone, sandstone and shale; ripple cross-laminated;* ŦJ1, *massive light grey weathering, fine crystalline, dark grey limestone*

PALEOZOIC

CARBONIFEROUS TO PERMIAN

CPMC — *MOUNT CHRISTIE FORMATION: resistant, orange to buff weathering, thin- to medium-bedded, light grey-green to black chert*

LOWER MISSISSIPPIAN

MT — *TAY FORMATION: recessive, dark brown weathering, thin- to medium-bedded, calcareous, dark grey to brown siltstone, sandstone and shale; thin to thick interbeds of fine crystalline, dark grey limestone;* MT1, *light grey weathering, thick bedded to massive, dark grey limestone*

DEVONIAN AND MISSISSIPPIAN
EARN GROUP (DP, DMP)
UPPER DEVONIAN TO MID-MISSISSIPPIAN

DMP — *PREVOST FORMATION: recessive, brown weathering, thin bedded, laminated, dark blue-grey to black slate and thin to thickly interbedded fine- to medium-grained chert-quartz arenite and wacke, and chert-pebble conglomerate;* DMP1, *resistant, coarse grained quartz sandstone*

LOWER DEVONIAN TO UPPER DEVONIAN

DP — *PORTRAIT LAKE FORMATION: black, gun-blue or silvery white weathering, thin bedded, siliceous, black siltstone, slate and chert*

ORDOVICIAN AND SILURIAN

OSR — *ROAD RIVER GROUP: undivided Duo Lake and Steel formations (may include infolds of* ЄOR *and* DP*) STEEL FORMATION (Upper Silurian): orange weathering, thin bedded, burrowed, dolomitic, grey-green mudstone, siltstone and chert; thin bedded, black chert; rare black graptolitic shale; DUO LAKE FORMATION (Lower Ordovician to Lower Silurian): resistant, grey weathering, thin- to medium-bedded, green, grey and black chert; recessive, gunsteel weathering, black graptolitic shale*

CAMBRIAN AND ORDOVICIAN
UPPER CAMBRIAN AND LOWER ORDOVICIAN
RABBITKETTLE FORMATION

ЄORG — *GOLD CREEK FACIES: grey-buff weathering, laminated to thin bedded, locally nodular limestone and shaly limestone; limestone conglomerate; light grey weathering, dark grey, thin bedded limestone separating members of dark brown weathering, black shale; medium green weathering, green shale*

ЄORT — *TWOPETE FACIES: resistant, dark grey weathering, massive to laminated, blocky, white to light grey quartzose siltstone and chert, and rare black slate; strikingly laminated, very fine grained, tuffaceous siltstone and chert; minor grey phyllitic limestone, calcareous phyllite, and greenstone*

ЄORV — *VANGORDA FACIES: silver-grey weathering, laminated to thin bedded, dark grey, shaly limestone to calcareous phyllite*

LOWER AND MIDDLE(?) CAMBRIAN

ЄG — *GULL LAKE FORMATION: recessive, brown weathering, non-calcareous, dark grey to black slate and siltstone; metamorphosed equivalents near Big Timber Pluton include quartz-muscovite-biotite schist*

PRECAMBRIAN

PROTEROZOIC AND LOWER CAMBRIAN
HYLAND GROUP (PY, PЄN)
PROTEROZOIC AND LOWER CAMBRIAN

PЄN — *NARCHILLA FORMATION: recessive, maroon weathering, interbedded maroon and apple-green slate; rare grey-brown weathering, medium- to thick-bedded quartz sandstone and quartz-pebble conglomerate*

PY — *YUSEZYU FORMATION: grey brown weathering, thin- to thick-bedded, interbedded, quartz sandstone, local quartz pebble conglomerate, and grey-green to dark grey slate;* PY1, *grey weathering, dark grey, fine crystalline limestone*

SYMBOLS

Geological boundary (defined, approximate, assumed or extrapolated beneath overburden, outcrop boundary) . . . . .

Fault, steeply dipping (defined, approximate, assumed or extrapolated beneath overburden; solid circle indicates downthrown side) . . . . .

Fault, thrust (defined, approximate, assumed or extrapolated beneath overburden; teeth indicate upthrust side) . . . . .

Anticline (approximate or extrapolated beneath overburden) . . . . .

Syncline (approximate or extrapolated beneath overburden) . . . . .

Cross-section lines . . . . .

Bedding, top known (inclined, overturned) 30

Bedding, top unknown (inclined, vertical) 15

Cleavage, foliation (inclined, vertical) 20

Minfile status (Anomaly, Deposit, Drilled Prospect, Open Pit) . . . . .

Minfile status (Prospect, Showing, Unknown) . . . . .

Fossil locality . . . . .

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5438
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
2008
SHEET 1 OF 3
FEUILLET 1 DE 3

Sheet 1 of 3: Sheldon Lake (105J)

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Canada