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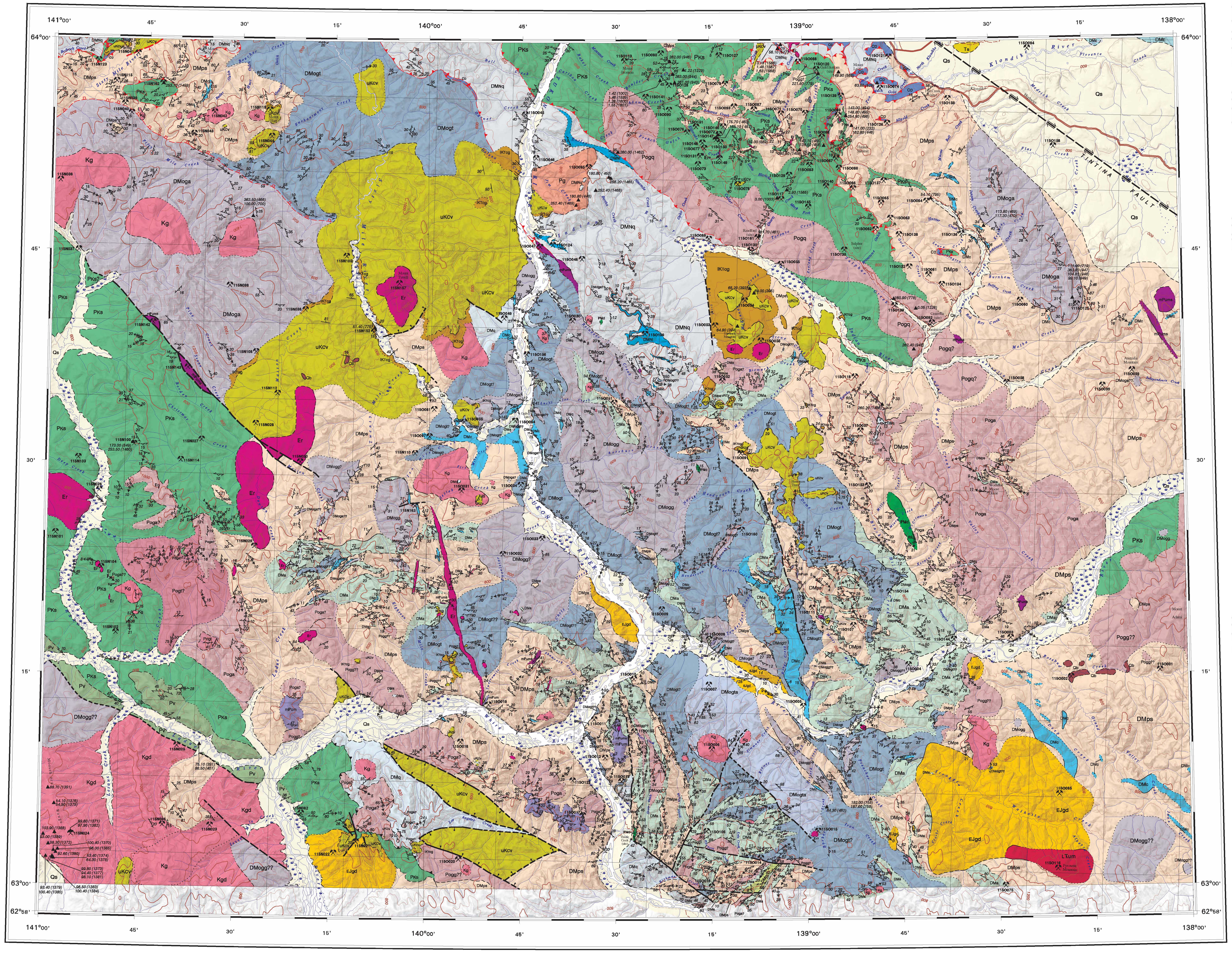
GEOLOGICAL SURVEY OF CANADA — COMMISSION GÉOLOGIQUE DU CANADA

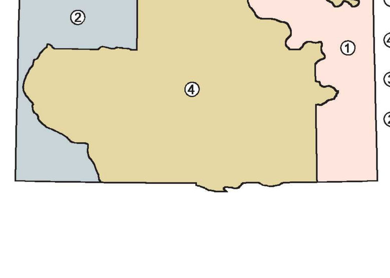
Ancient Pacific Margin NATMAP CARTNAT — Ancienne marge du Pacifique

MINERAL PROSPECTS (FROM YUKON MINFILE, 2004)

MINFILENO	NTS	NAME	STATUS	DEPOSIT TYPE	COMMODITY
115N021	115N/1	ARIES	SHOWING	PORPHYRY CU-MO-AU	
115N022	115N/1	LIBRA	UNKNOWN	UNKNOWN	
115N023	115N/2	ORION	ANOMALY	UNKNOWN	
115N024	115N/2	MOOSEHORN	OPEN PIT PAST PRODUCER	EPITHERMAL AU-AG-CU: HIGH SULPHIDATION	
115N025	115N/2	MILBURN	ANOMALY	UNKNOWN	
115N026	115N/7	LADUE	SHOWING	PORPHYRY CU-MO-AU	
115N027	115N/10	SANTA	SHOWING	POLYMETALLIC VEINS AG-PB-ZN±AU	
115N028	115N/9	SVENN	ANOMALY	COAL	
115N029	115N/8	PAX	ANOMALY	PORPHYRY CU-MO-AU	
115N030	115N/9	RION	UNKNOWN	UNKNOWN	
115N036	115N/9	HOYLE	UNKNOWN	UNKNOWN	Au, Ag, Zn, Cu
115N037	115N/15	MAG	UNKNOWN	UNKNOWN	
115N038	115N/15	CRAG	ANOMALY	UNKNOWN	Ag, Sb, Au
115N039	115N/15	LERNER	OPEN PIT PAST PRODUCER	POLYMETALLIC VEINS AG-PB-ZN±AU	Ag, Au, Pb
115N040	115N/15	CONNAUGHT	OPEN PIT PAST PRODUCER	POLYMETALLIC VEINS AG-PB-ZN±AU	
115N041	115N/15	PER	DRILLED PROSPECT	POLYMETALLIC VEINS AG-PB-ZN±AU	
115N042	115N/15	BUTLER	DRILLED PROSPECT	CU SKARN	
115N043	115N/15	FIFTY	ANOMALY	CU SKARN	
115N044	115N/16	ENCHANTMENT	SHOWING	PALEOPLACER	
115N082	115N/1	PROSPECT	ANOMALY	UNKNOWN	Cu, Mo
115N096	115N/2	STADNYK	UNKNOWN	AU-QUARTZ VEINS	Cu, Au
115N098	115N/10	JOVE	DRILLED PROSPECT	PORPHYRY U	
115N100	115N/10	BORED	ANOMALY	KUROKO MASSIVE SULPHIDE CU-PB-ZN	
115N101	115N/7	BLAKESTAD	UNKNOWN	UNKNOWN	Au, Ag, Cu, Zn, Pb
115N102	115N/7	RICE	UNKNOWN	UNKNOWN	
115N103	115N/10	DEEP	UNKNOWN	UNKNOWN	Mo, Cu
115N104	115N/7	BINGHAM	UNKNOWN	PLUTONIC RELATED AU	Ag, Pb, Sn
115N105	115N/9	HECTOR	UNKNOWN	UNKNOWN	Coal
115N108	115N/9	SON	ANOMALY	PORPHYRY U	Mo, Cu
115N110	115N/9	FLUME	PROSPECT	UNKNOWN	
115N112	115N/9	SAVAGE	UNKNOWN	UNKNOWN	
115N114	115N/10	LODE	UNKNOWN	UNKNOWN	Au, Ag
115N115	115N/15	THE	UNKNOWN	AU-QUARTZ VEINS	
115N119	115N/16	MT. HART	ANOMALY	UNKNOWN	
115N123	115N/15	BEDROCK	SHOWING	AU-QUARTZ VEINS	Au
115N142	115N/10	JILL	UNKNOWN	UNKNOWN	
115N143	115N/10	BORDEN	UNKNOWN	UNKNOWN	
115N152	115N/9	SIXTY MILE	SHOWING	COAL	
115N157	115N/9	TYR	UNKNOWN	UNKNOWN	Pb, Ag, Au
115N162	115N/15	PEAK	SHOWING	KUROKO MASSIVE SULPHIDE CU-PB-ZN	Pb, Ag, Au
115N163	115N/8	TR5	SHOWING	SKARN	Au, Zn, Pb, Ag, Hg
115O001	115O/8	PAIN	UNKNOWN	UNKNOWN	Mo, Ag, Cu, Au, Pb, Sb
115O002	115O/1	ADAMI	UNKNOWN	UNKNOWN	Cu
115O003	115O/8	PITTSBURGH	UNKNOWN	UNKNOWN	Au, Cu
115O004	115O/7	MAISY MAY	UNKNOWN	UNKNOWN	
115O005	115O/3	COOPER	UNKNOWN	AU-QUARTZ VEINS	Au
115O006	115O/3	SCOTCH	UNKNOWN	UNKNOWN	Asbestos
115O007	115O/3	THREE SISTERS	UNKNOWN	UNKNOWN	Au
115O008	115O/6	TENDERFOOT	UNKNOWN	UNKNOWN	Cu
115O009	115O/6	BURIAN	UNKNOWN	UNKNOWN	
115O010	115O/3	TREVA	UNKNOWN	AU-QUARTZ VEINS	Cu, Mo
115O011	115O/4	SHAMROCK	UNKNOWN	UNKNOWN	
115O012	115O/4	NORTHERN LIGHTS	UNKNOWN	AU-QUARTZ VEINS	Fixed Ca
115O013	115O/3	DONAHUE	UNKNOWN	UNKNOWN	Au
115O014	115O/3	BLACK FOX	SHOWING	POLYMETALLIC VEINS AG-PB-ZN±AU	Cu, Ag, Au
115O015	115O/2	AGATE	ANOMALY	UNKNOWN	Au
115O016	115O/3	NONPAREIL	UNKNOWN	UNKNOWN	Au
115O017	115O/4	JACK	ANOMALY	UNKNOWN	
115O018	115O/4	PEARSON	UNKNOWN	UNKNOWN	
115O019	115O/4	WOLVERINE LEDGE	UNKNOWN	UNKNOWN	
115O020	115O/4	APOLLO	ANOMALY	PORPHYRY CU-MO-AU	Au
115O031	115O/5	CARDIFF	PROSPECT	AU-QUARTZ VEINS	
115O032	115O/5	EXCELSIOR	UNKNOWN	UNKNOWN	Au, Ag
115O033	115O/5	GOLDIKE	UNKNOWN	UNKNOWN	Au, Pb, Ag, Zn
115O034	115O/5	COMET	UNKNOWN	UNKNOWN	Au, Pb
115O035	115O/12	TENMILE	SHOWING	AU-QUARTZ VEINS	Au, Cu, Pb
115O045	115O/13	MONTE CHRISTO	UNKNOWN	UNKNOWN	Au, Ag
115O046	115O/13	PICKERING	PROSPECT	AU-QUARTZ VEINS	Ag, Pb, Au, Cu, Zn, Sb
115O047	115O/13	INDIAN	SHOWING	ASBESTOS	Au, Ag
115O048	115O/12	BISHOP	UNKNOWN	AU-QUARTZ VEINS	Cu, Ag
115O049	115O/12	WOOD	SHOWING	CU SKARN	Pb, Cu, Ag, Au, Zn
115O050	115O/12	RUDOLF	UNKNOWN	PLUTONIC RELATED AU	Au, Ag
115O051	115O/12	BURMEISTER	DRILLED PROSPECT	KUROKO MASSIVE SULPHIDE CU-PB-ZN	Au, Barite, Cu, Pb, Ag
115O052	115O/11	BISMARK	ANOMALY	AU-QUARTZ VEINS	Zn
115O053	115O/11	HAYSTACK	DRILLED PROSPECT	COAL	Au
115O054	115O/11	MCKINNON	DRILLED PROSPECT	PALEOPLACER	Au, Pb, Ag
115O055	115O/11	RAVEN	SHOWING	KUROKO MASSIVE SULPHIDE CU-PB-ZN	Au, Ag
115O056	115O/11	FOTHERGILL	ANOMALY	PALEOPLACER	Pb, Mo, Cu, Ag
115O057	115O/10	EUREKA	ANOMALY	UNKNOWN	As, Au
115O058	115O/9	AUSTRALIA	UNKNOWN	UNKNOWN	
115O059	115O/9	PIQUE	UNKNOWN	UNKNOWN	Fluorite
115O060	115O/9	BURNHAM	ANOMALY	UNKNOWN	Cu
115O061	115O/10	PAYNE	PROSPECT	AU-QUARTZ VEINS	Au
115O062	115O/15	BRIMSTONE	UNKNOWN	UNKNOWN	Coal
115O063	115O/15	GOLD RUN	PROSPECT	AU-QUARTZ VEINS	Cu
115O064	115O/15	PORTLAND	PROSPECT	AU-QUARTZ VEINS	
115O065	115O/15	DOMINION	SHOWING	AU-QUARTZ VEINS	Au
115O066	115O/15	LLOYD	PROSPECT	AU-QUARTZ VEINS	Au, Ag
115O067	115O/15	HUNKER DOME	PROSPECT	AU-QUARTZ VEINS	
115O068	115O/15	MITCHELL	DRILLED PROSPECT	AU-QUARTZ VEINS	Au, Pt
115O069	115O/15	FAWCETT	PROSPECT	AU-QUARTZ VEINS	
115O070	115O/15	BUM	SHOWING	CU±AG QUARTZ VEINS	Ag, Au
115O071	115O/14	BOX CAR	PROSPECT	POLYMETALLIC VEINS AG-PB-ZN±AU	
115O072	115O/14	LONE STAR	UNDERGROUND PAST PRODUCER	PLUTONIC RELATED AU	
115O073	115O/14	VIOLET	UNDERGROUND PAST PRODUCER	AU-QUARTZ VEINS	W
115O074	115O/15	LEOTTA	ANOMALY	POLYMETALLIC VEINS AG-PB-ZN±AU	Au
115O075	115O/1	MARIPOSA	ANOMALY	AU-QUARTZ VEINS	
115O076	115O/14	HILCHEY	DRILLED PROSPECT	AU-QUARTZ VEINS	Ag, Au, Pb
115O077	115O/14	BUCKLAND	DRILLED PROSPECT	AU-QUARTZ VEINS	
115O078	115O/14	JEN	ANOMALY	UNKNOWN	
115O079	115O/14	FORK	ANOMALY	POLYMETALLIC VEINS AG-PB-ZN±AU	
115O080	115O/14	HILKER	UNKNOWN	UNKNOWN	Cu, Pb
115O081	115O/12	SESTAK	SHOWING	BARITE-FLUORITE VEINS	Au, Pd, Pt, Cu, Ni, Cr
115O083	115O/15	GREENBACK	UNKNOWN	UNKNOWN	
115O084	115O/12	CRUIKSHANK	UNKNOWN	COAL	Ag, Au
115O085	115O/1	MCMICHAEL	SHOWING	PORPHYRY CU-MO-AU	
115O086	115O/15	GOLDEN ROD	UNKNOWN	UNKNOWN	Asbestos
115O087	115O/14	CARMACKS	DRILLED PROSPECT	PLUTONIC RELATED AU	
115O088	115O/14	TRILBY	SHOWING	PLUTONIC RELATED AU	
115O089	115O/14	TORRANCE	UNKNOWN	UNKNOWN	U
115O090	115O/14	BALD EAGLE	DRILLED PROSPECT	GABBROID CU-NI	Cu, Pb, Zn
115O091	115O/11	HRKAC	UNKNOWN	UNKNOWN	
115O092	115O/10	GRANVILLE	UNKNOWN	UNKNOWN	
115O093	115O/14	FLANNERY	UNKNOWN	AU-QUARTZ VEINS	
115O094	115O/16	GOOSE	UNKNOWN	UNKNOWN	
115O095	115O/13	GLEESON	ANOMALY	W SKARN	
115O097	115O/12	THIRTEEN	ANOMALY	UNKNOWN	U
115O099	115O/9	ABNER	ANOMALY	UNKNOWN	
115O106	115O/3	HAKONSON	UNKNOWN	AU-QUARTZ VEINS	
115O107	115O/7	SUPERSTAR	UNKNOWN	UNKNOWN	
115O109	115O/11	RUBY	UNKNOWN	UNKNOWN	
115O111	115O/7	PILOT	UNKNOWN	UNKNOWN	Au
115O113	115O/14	BRONSON	ANOMALY	KUROKO MASSIVE SULPHIDE CU-PB-ZN	Ag, Au, Cu
115O116	115O/1	PYROXENE	ANOMALY	PODIFORM CHROMITE	Silica, Ca
115O117	115O/14	BLANCHE	UNKNOWN	UNKNOWN	
115O118	115O/10	ARMENIUS	SHOWING	AU-QUARTZ VEINS	
115O120	115O/15	ENVOLDSEN	UNKNOWN	GABBROID CU-NI	Au, Ag
115O121	115O/15	ASBESTOS BLUFF	SHOWING	ASBESTOS	Pb, Cu, Zn
115O122	115O/4	VANESSA	UNKNOWN	UNKNOWN	Au
115O124	115O/13	HOBBS	PROSPECT	LIMESTONE	Au
115O125	115O/9	MELBA	ANOMALY	UNKNOWN	Au
115O126	115O/15	ALL GOLD	SHOWING	AU-QUARTZ VEINS	Au, Cu, Ag
115O127	115O/14	LINDOW	SHOWING	AU-QUARTZ VEINS	Ag, Au
115O128	115O/14	ORO FINO	SHOWING	AU-QUARTZ VEINS	Ag, Au
115O129	115O/14	SCHRAMM	DRILLED PROSPECT	UNKNOWN	Au, Ag
115O130	115O/14	GRANT	DRILLED PROSPECT	AU-QUARTZ VEINS	
115O131	115O/14	CULLEN	SHOWING	AU-QUARTZ VEINS	Au, Ag
115O132	115O/10	DEVINE	PROSPECT	AU-QUARTZ VEINS	Au, Ag
115O133	115O/10	SULPHUR	DRILLED PROSPECT	UNKNOWN	Au, Ag
115O134	115O/10	CARON	DRILLED PROSPECT	AU-QUARTZ VEINS	Au
115O135	115O/15	SUL	DRILLED PROSPECT	UNKNOWN	Pb, Zn, Cu
115O136	115O/15	GATENBY	DRILLED PROSPECT	UNKNOWN	
115O137	115O/15	DOM	DRILLED PROSPECT	UNKNOWN	
115O138	115O/15	COWAN	DRILLED PROSPECT	UNKNOWN	
115O139	115O/15	HUN	DRILLED PROSPECT	AU-QUARTZ VEINS	
115O140	115O/15	BRADY	DRILLED PROSPECT	UNKNOWN	Au, Pb
115O141	115O/14	GONZALES	SHOWING	KUROKO MASSIVE SULPHIDE CU-PB-ZN	Au
115O144	115O/7	FLETCHER	UNKNOWN	UNKNOWN	Au
115O145	115O/15	BLUE SKY	UNKNOWN	UNKNOWN	Au
115O146	115O/14	VICTORIA	DRILLED PROSPECT	PLUTONIC RELATED AU	Au
115O147	115O/14	PARNELL	SHOWING	AU-QUARTZ VEINS	Au
115O148	115O/14	ROBIN EGG	DRILLED PROSPECT	AU-QUARTZ VEINS	Coal
115O149	115O/14	ROACH	SHOWING	AU-QUARTZ VEINS	
115O150	115O/14	PIONEER	DRILLED PROSPECT	AU-QUARTZ VEINS	
115O151	115O/14	AMANDA	SHOWING	CU±AG QUARTZ VEINS	
115O153	115O/7	DONNA	UNKNOWN	UNKNOWN	
115O154	115O/7	WHITE	UNKNOWN	UNKNOWN	
115O155	115O/3	FRISCO	UNKNOWN	UNKNOWN	Pb, Ag, Au
115O156	115O/12	STOCKADE	UNKNOWN	UNKNOWN	
115O158	115O/16	HOT	UNKNOWN	UNKNOWN	
115O159	115O/15	FLAT	UNKNOWN	UNKNOWN	
115O160	115O/6	HEN	UNKNOWN	UNKNOWN	
115O161	115O/14	READFORD	SHOWING	KUROKO MASSIVE SULPHIDE CU-PB-ZN	Au



SOURCES OF INFORMATION

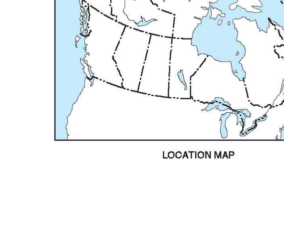


① Bostock, H.S. (1942)

④ Tempelman-Kluit, D.J. (1974)

③ Mortensen, J.K. (1996)

② Ryan, J J and Gordey, S P. (2004)



LOCATION MAP

Authors: S.P. Gordey and J.J. Ryan

Geology by J.J. Ryan and S.P. Gordey (2000-2003), P. Glombick and S. Piercey (2002), M. Colpron, C. Roots, S. Piercey and T. Ruks (2003), (incorporating previous field work by D.J. Tempelman-Kluit in 1970-1972, J.K. Mortensen in 1983-1984, 1986-1991, 1995-1996 and H.S. Bostock in 1935-1937)

Co-ordinated by S.P. Gordey through the auspices of the Ancient Pacific Margins NATMAP project

Digital cartography by R.B. Cocking, Earth Sciences Sector Information Division (ESS Info)

OPEN FILE 4970

GEOLOGY

STEWART RIVER AREA
(115 N, 115-O AND PART OF 115 J)

YUKON TERRITORY

Scale 1:250 000/Échelle 1/250 000

kilometres 5 0 5 10 15 20 kilomètres

Transverse Mercator Projection
Central meridian 139°30'W, Scale Factor 0.9996
North American Datum 1983

Projection transverse de Mercator
Méridien central 139° 30' W, facteur d'échelle 0.9996
Système de référence géodésique nord-américain, 1983

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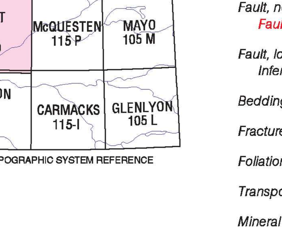
Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Digital base map from data compiled by Geomatics Canada, modified by ESS Info

Mean magnetic declination 2005, 25°30´E, decreasing 18.8´ annually. Readings vary from 26°6´E in the northeast corner to 24°52´ in the southwest corner of the map

Elevations in metres above mean sea level



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE

LEGEND

CENOZOIC

QUATERNARY

Qs — *Fluvial silt, sand and gravel*

Qb — *Basalt*

NORTHEAST OF TINTINA FAULT

CENOZOIC

TERTIARY

Ts — *Conglomerate, sandstone, shale*

PALEOZOIC

DEVONIAN TO MISSISSIPPIAN?

DMɛ — *EARN GROUP?: well bedded, black, grey and brown argillite, brown sandstone and pebble conglomerate*

SOUTHWEST OF TINTINA FAULT

CENOZOIC

TERTIARY

EOCENE

Er — *PORPHYRY: Smokey quartz and K-feldspar phyric rhyolite to rhyodacite stocks and dykes, and possible rare flows*

MESOZOIC

CRETACEOUS

UPPER CRETACEOUS

uKCv — *CARMACKS GROUP: rhyodacite and dacite, commonly biotite and hornblende phyric, dominated by lesser andesite and basalt; minor rhyolite*

MID?-CRETACEOUS

Kg | Kgd — *GRANITE/GRANODIORITE: Kg, pink to grey, locally porphyritic syenogranite to monzogranite plutons and dykes; Kgd, biotite-hornblende bearing granodiorite, locally foliated*

LOWER CRETACEOUS

lKTcg — *TANTALUS(?) FORMATION: clast-supported pebble to cobble conglomerate with clasts of vein quartz and foliated quartzite*

JURASSIC

EARLY JURASSIC

EJgd — *GRANODIORITE: chlorite-altered hornblende and biotite-bearing granodiorite, monzogranite, quartz monzonite and quartz monzodiorite*

TRIASSIC

LATE TRIASSIC

LTum — *PYROXENE MOUNTAIN BODY: medium to coarse-grained, massive, equigranular pyroxenite; minor hornblendite*

PALEOZOIC AND/OR MESOZOIC

PMd — *GABBRO: foliated to unfoliated metagabbro (locally garnet-bearing); diabase, metabasite*

PALEOZOIC

CARBONIFEROUS

CD — *DAWSON-CLINTON CREEK ASSEMBLAGE: greenstone, serpentinite, harzburgite*

MID(?)- TO LATE PALEOZOIC

mPum | mPums — *ULTRAMAFIC-GABBRO: foliated to unfoliated amphibolite facies metagabbro, metapyroxenite, serpentinite and talc-siderite schist; mPums, dominantly serpentinite*

PERMIAN

Pv — *FOLIATED VOLCANIC: chlorite-altered weakly foliated intermediate to mafic aphanitic volcanic flows and tuffs, locally with clastic textures preserved*

PKs — *KLONDIKE SCHIST: muscovite-chlorite-quartz-feldspar schist, chlorite schist, chlorite phyllonite; local cleaved lapilli tuff with preserved primary texture, probably derived from Pv*

Pg — *JIM CREEK PLUTON (circa 252.4 Ma): granite to quartz monzonite, coarse grained, biotite-bearing, commonly K-feldspar megacrystic; lacks superposed structural fabric as seen in Pog (and DMog)*

Pogg | Pogq | Poga | Pogt — *ORTHOGNEISS (YOUNGER, 264-259 Ma): Pog, undivided orthogneiss; Pogg, pink to orange K-feldspar rich, granitic orthogneiss, commonly includes or associated with Poga; Poga, mainly K-feldspar augen orthogneiss, exhibits various states of strain including porphyroclastic straight gneiss, commonly includes or associated with Pogg; Pogt, rare, mainly tonalitic orthogneiss; Pogq, orthogneiss derived from quartz monzonite; refers to highly strained, mafic poor, Sulphur Creek orthogneiss; ?-age assignment probable, ??-age assignment assumed (alternatively could be part of DMog).*

DEVONIAN TO MISSISSIPPIAN

DMNq | DMNl — *NASINA ASSEMBLAGE: DMNq, fine-grained, dark-grey to black carbonaceous quartzite and metapelite; DMNl, marble*

DMogg | DMoga | DMogt — *ORTHOGNEISS (OLDER, 363-343 Ma): DMog, undivided orthogneiss; DMogg, pink to orange K-feldspar rich, granitic orthogneiss, commonly with biotite, banded to layered, commonly includes or associated with DMoga; DMoga, mainly K-feldspar augen orthogneiss, commonly includes or associated with DMogg; DMogt, mainly tonalitic or intermediate to mafic orthogneiss, generally grey, banded to layered, commonly veined; commonly interlayered with amphibolite schist and gneiss, biotite and/or hornblende bearing; ?-age assignment probable, ??-age assignment assumed (alternatively could be part of Pog)*

DMogta — *Undivided DMogt (ORTHOGNEISS (OLDER)) and DMa (AMPHIBOLITE)*

DMa — *AMPHIBOLITE: amphibolite schist and gneiss; metabasite; probably derived from mafic to intermediate volcanic or volcaniclastic rocks; locally associated with psammite or interlayered with orthogneiss*

DMm — *MAFIC SCHIST: biotite-hornblende+/-plagioclase+/-quartz metabasite?; generally associated with amphibolite; main locality on Thistle Mountain*

DMc — *MARBLE: marble (metacarbonate) derived from pure to impure limestone; associated calc-silicate schist derived from calcareous metapelite*

DMps — *QUARTZ-MICA SCHIST: undivided metasedimentary rocks dominated by metapsammite, semipelite and metapelite; commonly quartz-garnet-biotite-muscovite schist possibly derived from siliceous siltstone; commonly finely interlayered with garnet metapelite; commonly contains members of micaceous quartzite; rare conglomerate; grades locally to paragneiss*

DMcg — *METACONGLOMERATE: pebble- to cobble-sized rounded clasts; mainly massive white vein quartz, but including some granitoid clasts (tonalite?); has an arkosic matrix; grades into quartzite; matrix supported*

DMq — *QUARTZITE: banded to massive, grey to white quartzite; apparently clastic in origin, or in part, possibly derived from metachert*

NOTE: Relative ages of many units are unknown; superimposed hillshade may darken colours on map from those shown on legend above

SYMBOLS

Geological contact (defined, approximate, assumed)

Fault, sense of movement uncertain (defined, approximate, assumed)

Fault, transcurrent, dextral (approximate)

Fault, thrust (teeth on upper plate) (defined, approximate, assumed)
Faults in red inferred by Mortensen, 1996

Fault, normal (teeth on upper plate) (defined, approximate, assumed)
Faults in red inferred by Mortensen, 1996

Fault, low-angle normal (teeth on upper plate) (approximate, assumed)
Inferred by Mortensen, 1996

Bedding — 40

Fracture cleavage, slaty cleavage — 23

Foliation (S2,S3) — 12, 24

Transposition foliation (ST) — 10

Mineral (elongation) lineation (L2) — 23

Minor fold axis (F1, u-fold) — 19

Minor fold axis (F2, u-fold, z-fold, s-fold) — 9, 19, 29

Minor fold axis (F3, u-fold, z-fold, s-fold) — 8, 18, 28

Minor fold axial plane (F2, F3) — 22, 44

Intersection lineation (IL3) — 10

Mineral Prospect (Yukon Minfile number (de Klerk, 2003); commodities, if known) — 115O999 Ag, Cu

Isotopic age determination (in Ma; (YUKONAGE number (Breitsprecher, et al, 2004)) — 96.50 (1383)

DESCRIPTIVE NOTES

INTRODUCTION

Access into the heart of the Stewart River area is afforded by boat along the Yukon and Stewart rivers and by truck on placer mining roads, many of which extend south from Dawson. Fieldwork in 2000-2003 included foot traverses from small camps mobilized along these routes and from helicopter or fixed-wing supported camps in more remote areas. All-terrain vehicles were used on placer mining access roads along Thistle, Kirkman, Henderson, Black Hills and Maisy Mae creeks and the Sixty Mile River. Helicopter spot checks were used to fill in widely separated outcrops in the southwest part of the map area where foot traverses or fly camps were impractical. Bedrock mapping is hampered by a deep (~1 m) soil veneer, thick gravel, and loess deposits in valley bottoms, and by dense cover of forest, moss, and lichen. Contacts between rock units are generally not exposed. Mapping was initiated as part of the Ancient Pacific Margin NATMAP project, whose aim was to understand the composition, relationships, and metallogeny of poorly understood pericratonic terranes lying between the ancestral North American margin and those known with more certainty to be tectonically accreted (Fig. 1). Concurrent surficial geological studies focused on the Quaternary history and setting of the numerous placer gold deposits in the region (e.g. Jackson et al., 2001, 2002; Rotheisler et al., 2003).

GEOLOGICAL FRAMEWORK

The Stewart River area is dominantly underlain by twice-transposed, amphibolite-facies gneiss and schist of mostly(?) Paleozoic age (Fig. 1, Yukon-Tanana terrane). These are intruded by younger plutonic or hypabyssal rocks (Late Triassic?, Jurassic, Cretaceous and Eocene;LTum, EJgd, Kg, Kgd, Er) and overlain by Upper Cretaceous volcanic rocks (uKCv), local Lower Cretaceous conglomerate (lKTcg) and rare Quaternary basalt (Qb). Scattered outcrops of unmetamorphosed Paleozoic strata of the ancestral North American margin (DMɛ) are juxtaposed across Tintina Fault to the northeast. Tertiary fluvial sediments (Ts) accumulated near the fault in pull-apart grabens. The reader is directed to Ryan and Gordey (2001a, b; 2002a, b; 2004), Gordey and Ryan (2003) and Ryan et al. (2003) for a more comprehensive description of the geology.

Metasiliciclastic rocks are widespread, and dominated by psammite and quartzite, with lesser pelites and rare conglomerate (DMq, DMcg, DMps). These were thought to be as old as late Proterozoic (e.g. Tempelman-Kluit, 1974); however, preliminary detrital zircon geochronology and geochronology for plutonic rocks suggest a middle Paleozoic age (M. Villeneuve, in prep.). Intermediate to mafic composition amphibolite (DMa, DMm) interdigitates with, and lies stratigraphically above, the siliciclastic rocks. Although intensely tectonized, heterogeneous compositional layering and local vestiges of primary textures in the amphibolite, such as breccia clasts and pillow selvages, indicate derivation from volcanic and volcaniclastic rocks. Marble horizons (DMc) occur within the amphibolite, as well as the siliciclastic rocks. In turn, dark carbonaceous quartzite, metapelite and minor marble of the Nasina assemblage (DMNq, DMNl), markedly sparse in volcanic-derived material, lies structurally above and/or may be partly equivalent to the aforementioned metaclastic rocks. Abundant orthogneiss bodies with diorite, tonalite, granodiorite, monzogranite and granite protoliths, intrude the above assemblages. Some are Devono-Mississippian in age (DMogg, DMoga, DMogt), whereas others (Pogg, Pogq, Poga, Pogt) are known to be Permian. For many others, the age is probably one of these, yet remains undetermined (designated by "?" meaning "likely", or "??" meaning "possibly", on map). The origins of ultramafic and gabbroic bodies are diverse. Some are sheet-like and allochthonous (e.g. CD near 64°N), whereas others occur as narrow bodies (mPum, mPums) along unit contacts (faults?). The degree of allochthoneity of gently dipping ultramafics that straddle the Yukon and White rivers (mPum, mPums, at about 63° 5' N) remains unclear. At other localities, ultramafic boudins enclosed by other lithologies are common and originated as pre-tectonic dykes or sills. The large body of fresh pyroxenite that underlies Pyroxene Mountain (633995E, 6990795N) is possibly a Late Triassic intrusion (LTum) although a Permian age is also permitted by geochronological data (M. Villeneuve, in prep.). Small gabbro bodies (PMd) are variably foliated and of uncertain age.

An extensive area of Permian, low to medium grade muscovite-quartz and chlorite-quartz schist (PKs) in the western part of the map area, correlated by Tempelman-Kluit (1974) with the Klondike Schist (McConnell, 1905) as mapped in the Dawson area (Mortensen, 1996) is derived from a combination of volcanic, volcaniclastic and plutonic rocks. Southeast of the White River this succession may lie beneath a low-angle fault. To the northwest, contact relationships are uncertain. East of Ladue River these rocks are overlain by relatively unstrained, chlorite-altered intermediate to mafic volcanics (Pv), of unknown but possibly Permian(?) age.

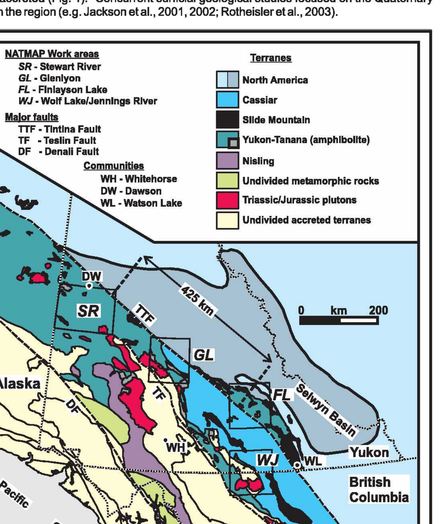


Fig. 1 Tectonic elements of the northern Cordillera

STRUCTURE

The Paleozoic rocks in the field area exhibit a regional foliation (ST), characterized by high-strain transposition of layering in the gneiss and schist, with abundant intrafolial isoclinal folds that are commonly rootless. The intensity of strain within the regional foliation locally grades to mylonite. Primary compositional layering (S0) in metasedimentary rocks and a pre-existing foliation (S1) can be traced around closures of the transposition folds, indicating that they are at least F2 structures (Fig. 2). F2 deformation appears to accompany the regional metamorphism, and preliminary geochronological results indicate that this happened during the mid-Permian (M. Villeneuve, in prep). The F2 folds are generally recumbent to shallowly inclined, close to isoclinal, long-wavelength structures. They commonly lack an axial planar foliation, and their axes parallel a regional extension lineation (L2). This relationship helps distinguish F2 and F3 folds, which can have very similar style. The latter are open, moderately inclined (but varying from shallow to steep), shallowly plunging structures, that have weak axial-planar fabric where developed in schistose layers, and have no associated extension lineation. The map area is also affected by faults of varying significance. Most of these could not be observed directly, but are interpreted from changes in rock type and/or structural grain; some are also well delineated by prominent physiographic and aeromagnetic lineaments. Locally, fault breccia and slickensides provide direct evidence of fault contacts.

TECTONIC SYNOPSIS

In summary, the extensive metaplutonic and metavolcanic rocks of the Stewart River area represent two periods of volcanic arc activity. An older arc, built upon a siliciclastic foundation (DMq, DMcg, DMps; DMNq?, DMNl?), largely comprises Devono-Mississippian amphibolite (DMa) associated with coeval widespread tonalitic orthogneiss (DMogg, DMoga, DMogt) that formed its subvolcanic intrusive complex. A Permian arc, built upon the previous, is represented by granitic orthogneiss (Pogg, Pogq, Poga, Pogt) and coeval metavolcanics (PKs and possibly Pv). Most rocks were deformed and metamorphosed in the mid-Permian, the Klondike Schist to greenschist grade and most of the remainder to amphibolite facies. The age of the undeformed Jim Creek pluton (Pg) at 252.4 Ma that cross-cuts the Nasina Assemblage (DMNq) provides an apparent younger age limit to Paleozoic deformation (age locality nos 1468, 1469; J.K. Mortensen in Breitsprecher et al, 2004). Episodic arc activity in the Jurassic (EJgd) and Cretaceous (Kg, Kgd) further built upon the deformed Paleozoic substrate.

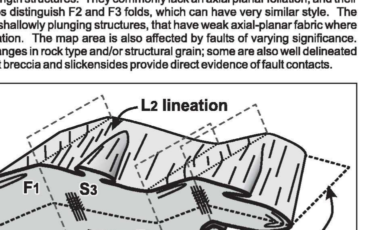


Fig. 2 Structural fabric elements

Rapid regional uplift in the Early Jurassic is indicated by widespread concordance of Ar/Ar mineral ages both in the Stewart River area (Villeneuve, in prep) and Alaska (Dusel-Bacon et al, 2002). Extensive rapid outpouring of shoshonitic basalt and dacite of the Carmacks Group (uKCv) in the Late Cretaceous may be mantle plume-related (e.g as described in Johnston et al, 1996). Finally, Eocene rhyolitic lavas (Er) resulted from tension or transtension that also led to dextral offset along Tintina fault (Fig. 1) displacing the Stewart River area 425 km from the Finlayson Lake area, to which it originally lay adjacent.

The above summary, particularly for the Paleozoic, inherently assumes depositional or intrusive contacts between rock units that is difficult to test given exposure in the Stewart River area. In the Dawson area Mortensen (1988, 1990, 1996) has mapped faults involving relatively unmetamorphosed Triassic strata which indicate Mesozoic, large-scale thrust imbrication between elements of Yukon-Tanana terrane. For example, both the Nasina and Klondike Schist assemblages are interpreted as bounded by faults which trend into the northern Stewart River area (Mortensen, 1996). Similarly, Permian relatively unmetamorphosed volcanic and ultramafic rocks near Dawson (CD) are interpreted as thrust bounded slivers of ophiolite, in places juxtaposed above Nasina assemblage. The implications of these relations (faults shown as red on this map) for the rest of Stewart River area will be re-evaluated as geochronological and pressure-temperature data are acquired.

ECONOMIC GEOLOGY

One of the more significant findings is that parts of the area are dominated by a mid-Paleozoic volcano-plutonic arc(?) complex with implied potential for VMS type mineralization. In the Finlayson Lake area (Fig. 1), correlative mid-Paleozoic strata host massive sulphide mineralization in both felsic (e.g., Kudz Ze Kayah and Wolverine Lake deposits; Murphy (1998, and references therein), Piercey et al, 2001) and mafic (Fyre Lake deposit; Foreman (1998)) metavolcanic sequences. Although abundant in mafic metavolcanics, the Stewart River area is unfortunately lacking in felsic counterparts. It should be noted that primary geochemical (e.g., alteration), structural and lithological signatures may be strongly modified by the amphibolite facies metamorphism and high state of strain in the Stewart River area.

The Lucky Joe occurrence was explored in 2003 by Kennecott Exploration and is currently being drilled (summer 2005). Two large strong parallel geochemical trends defined by high soil values of Cu and Au, with associated Mo and Ag, have been identified (press release: www.copper-ridge.com). The origin of the occurrence is obscured by complex structure and metamorphism. Cu-Au porphyry, Fe-oxide Cu-Au, or sediment-hosted Cu deposit models have all been suggested. A Mississippian (circa 350 Ma) rhenium-osmium age from molybenite coincident with a zircon age (Villeneuve, in prep.) from nearby metaplutonic rocks supports the first possibility. The Lucky Joe represents a new type of potentially large occurrence within Yukon-Tanana terrane.

In Yukon and Alaska, mid-Cretaceous (105-90 Ma) and Late Cretaceous (70-65 Ma) plutons and their country rock are prospective targets for intrusion-related gold deposits (e.g., Hart et al., 2000), in the Stewart River area typified by auriferous gold veins in the Moosehorn Range (Yukon Minfile 115N024, Moosehorn/Longline property). Other, undeformed granite-syenite stocks, such as near Mt. Stewart (Kg), possibly of Cretaceous or Tertiary age, could be prospective. Although perhaps of less significance, Early Jurassic plutons (EJgd) are known to host Au ±Cu rich shear zones, stockworks and skarns in Alaska (Newberry, 2000) as well as central Yukon (e.g. Minto deposit, Tafti and Mortensen, 2004). Other plutonic bodies show evidence of significant strain, as all pre-Early Jurassic (Paleozoic) in age, and regionally unproductive. The source of gold leading to significant placer deposits in many drainages (e.g. Thistle, Kirkman, Barker, Scroggie, Black Hills, Maisy Mae and Henderson creeks) remains enigmatic. For example, Dumula and Mortensen (2002) suggest undiscovered intrusion-related gold as a placer source within the Thistle basin on the basis of placer gold composition. However, Mesozoic plutonic rocks are rare within this drainage. They also indicate that as yet undiscovered sources for placer gold in the Eureka Dome (608693E, 7046842N) or Henderson Dome (597651E, 7040596N) area are of epithermal origin. Rotheisler et al suggest two separate, as yet unidentified lode gold occurrences sourced placer deposits in the Scroggie Creek basin.

COMPILATION NOTES

Incorporation of previous work (Tempelman-Kluit (1972), Mortensen (1996), Bostock (1942)) was relatively straight forward. Most contacts could be matched and rock units re-assigned to the legend used for this open file. An exception is in northern Stewart River area where a subunit of the Klondike Schist of Mortensen (1996, unit Psq) is re-assigned to unit DMps on the present map. There is little doubt that the schist and quartzite of unit DMps trend into and are in part, or largely, correlative. The nature of contacts in northern Stewart River area remain as depicted by Mortensen (1996), with the exception of the augen orthogneiss of Mount Burnham (634336E, 7065638N) for which our preference is an intrusive rather than low-angle, normal-fault boundary.

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