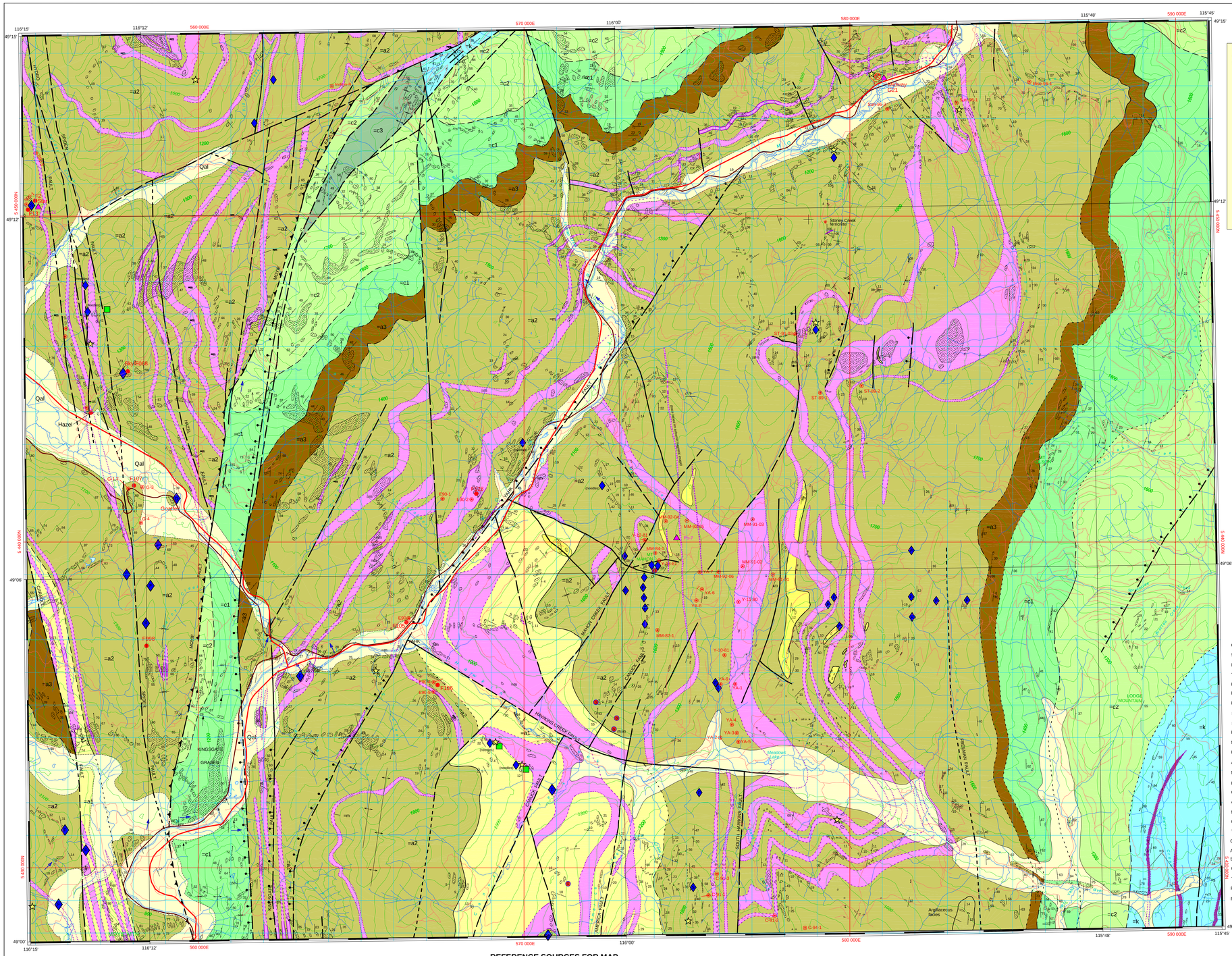


BRITISH COLUMBIA
Ministry of Energy and Mines
Minerals Division
Geological Survey Branch

Geological Survey Branch

Geoscience Map 1998-2

GEOLOGICAL COMPILATION OF THE YAHK (EAST HALF) AND YAHK RIVER (WEST HALF) MAP AREAS, SOUTHEASTERN BRITISH COLUMBIA

NTS 82F/1E, 82G/4W

Compilation by D.A. Brown

Geology by: D. Anderson, J.A. Bradford, D.A. Brown, L. Diakow, S. Coombes, T. H öy, C. Kennedy, P. Klewchuk, D.M. Melville, B. Nassichuk, P. Ransom, J. Reesor, J. Ryley, M. Smith,P. Stinson, P. Van Angeren, R.D. Woodfill and others

SCALE 1:50 000

0 1 2 3 4 5
Kilometres

[NOTE: This digital map was last updated on December 21, 1998]

LAYERED ROCKS

QUATERNARY

Qal — Unconsolidated outwash, alluvium, colluvium and till.

MIDDLE PROTEROZOIC (Helikian)

PURCELL SUPERGROUP

KITCHENER FORMATION

=k — Undivided sedimentary rocks. Thin bedded, brown weathering dolomitic siltstone and green argillite.

=k2 — Dolomitic siltstone, dolomitic argillite, dolomite, commonly buff-weathering; argillite, siltstone, quartzite; molar tooth texture; green tinged dolomictic siltstone near base.

=k1 — Green, beige siltstone, dark grey argillite; dolomitic siltstone.

CRESTON FORMATION

=c — Undivided sedimentary rocks. light grey, mauve, green siltstone and argillite; thin- to medium-bedded quartz arenite, quartz wacke. Lenticular bedding, ripples, cross-bedding and mudcracks.

=c3 — **Upper**: green siltstone; black or purple argillite and siltstone.

=c2 — **Middle**: light grey, mauve, purple, thin- to medium-bedded quartz arenite, quartz wacke, lesser grey siltite and argillite. White quartzite interbeds. Lenticular bedding, ripples, cross-bedding and mudcracks.

=c1 — **Lower**: waxy green to olive with tan weathering surfaces, thin- to thick-bedded to laminated argillite and siltite. Lesser fine grained quartz wacke. Wavy bedding and abundant mudcracks.

ALDRIDGE FORMATION

=a — Undivided sedimentary rocks.

=af — Sedimentary fragmental: stratiform to discordant; matrix-supported to framework-supported, angular to rounded, fine quartz wacke fragments. Fragment sizes vary greatly -- from < 2 mm to > 2 m. Interpreted to be synsedimentary debris flows, dewatering structures, mud volcanoes and hydrothermal breccias.

=a3 — **Upper**: rusty brown weathering, grey to dark grey, fissile to platy, laminated silty argillite, siltite.

=a2 — **Middle**: grey to rusty weathering, thick to thin-bedded, quartzofeldspathic wacke, intercalated argillite and siltite.

=a1 — **Lower**: light grey weathering, medium to thick bedded, medium to fine-grained, quartzite, quartz arenite and quartz wacke. Lenticular bedding and local cross-bedding.

=a1r — **Ramparts Facies**: light grey weathering, medium to thick bedded, medium to fine-grained, quartzite, quartz arenite and quartz wacke. Lenticular bedding and local crossbedding. Rare rusty brown wacke horizons towards base of the exposed section.

INTRUSIVE ROCKS

PROTEROZOIC

POST-MOYIE INTRUSIONS (Nicol Creek feeders?)

=s — Mafic sills and rare dikes hosted in Kitchener Formation. Olive green, massive to plagioclase porphyritic. Probable feeders to the Nicol Creek Formation. Zircon and baddeleyite U-Pb date of 1439.1 ± 2.4 Ma (Don Davis, Nov., 1997; in Brown and Woodfill, 1998).

MOYIE INTRUSIONS

=m — "Moyie Sills": Dark green to black, medium- to fine-grained gabbro and hornblende quartz diorite sills and minor dikes. Zircon U-Pb dates circa 1467 Ma (Anderson and Davis, 1995).

SYMBOLS

- Geological boundaries (defined, approximate, assumed)
- Sill or dike contact (defined, approximate, assumed)
- Normal fault (defined, approximate, assumed)
- Thrust (reverse) fault (defined, approximate, assumed)
- High angle fault (defined, approximate, assumed)
- Limit of Quaternary cover
- Limit of mapping
- Bedding with tops observed (inclined, overturned) — 14, 63
- Bedding with tops observed (inclined, vertical, horizontal) — 22
- Foliation: schistosity or fracture cleavage (inclined, vertical) — 35
- Minor fold (axial plane with plunge of axis) — 47, 30
- Fold axis of minor fold; based on bedding-cleavage intersection — 27, 48
- Anticline, syncline (trace of axial plane) — 68
- Measured fault plane (inclined, vertical)
- Paleocurrent direction
- Glacial striae
- Adit, trench, drill hole (approximate drill hole projection indicated by red line) — C-91-1
- MINFILE (F=082FNE, G=082GSE; mineral occurrence, past producer) — F105
- Outcrop (in area traversed by Brown or Smith)
- Tourmalinite (outcrop, S= stratiform, D=discordant; F=float)
- Garnetiferous beds (manganese-rich garnet)
- Albite alteration
- Sedimentary fragmental (S = stratiform; D = discordant) — S
- Galena Pb - isotope (Pb-Pb) — Pb-5
- Topographic contour (100m interval)
- Road (paved - primary, secondary; gravel - some impassable)
- Railway

True North
Grid North 0°41'
Magnetic North 17°30'

BASE MAP INFORMATION
North American Datum 1983, UTM Zone 11; Transverse Mercator Projection.
Topographic base modified from TRIM 1:20 000 digital data; Contour interval 100m.
Approximate Mean Declination 1994 for centre of 82F/020; Decreasing 7.4 annually.

ACKNOWLEDGMENTS: We have benefited from geological discussions with Doug Anderson, Bob Woodfill, Craig Kennedy, Peter Klewchuk and John Reesor. Previous mapping of parts of the area by John Reesor (1993), Trygve Höy (1993) and Cominco Ltd. was used extensively and incorporated in this map. Verna Vilkos' assistance in the final map production is gratefully acknowledged. Map reviewed by W.J. McMillan.

COMMENTS OR CORRECTIONS:
Any improvements or comments concerning this map would be appreciated. Please contact Derek Brown at (250) 952-0432, FAX (250) 952-0381, Email derek.brown@gems.gov.bc.ca

Recommended citation: Brown, D.A. (1998): Geological Compilation of the Yahk (East Half) and Yahk River (West Half) Map Areas, Southeastern British Columbia (82F/1E, 82G/4W); *B.C. Ministry of Energy and Mines* , Geoscience Map 1998-2, 1:50 000 scale map.

Copies of this map may be obtained from Crown Publications Inc., Victoria, B.C.

REFERENCE SOURCES FOR MAP

Cominco Ltd. (unpub. maps) — Hoy (1993)
Van Anderen and Nassichuk (1997) — Brown et al. (1995)

82F029 82F030 82G021 82G022
82F019 82F020 82G011 82G012
82F009 82F010 82G001 82G002

STATION LOCALITY (this work)

- 1993: D.A. Barron, J.A. Bradford, J.M. Britton, D.A. Brown, G.K. Manson, D.M. Melville, P. Stinson
- 1994: D.A. Barron, J.A. Bradford, J.M. Britton, D.A. Brown, G.K. Manson, D.M. Melville, P. Stinson
- 1997: D.A. Brown, M. Smith

REFERENCES

Anderson, H.E. and Davis, D.W. (1995): U-Pb geochronology of the Moyie sills, Purcell Supergroup, southeastern British Columbia: implications for the Middle Proterozoic geologic history of the Purcell (Belt) basin. *Canadian Journal of Earth Sciences*, v. 32, p. 1180-1193.

Brown, D.A., Bradford, J.A., Melville, D.M., Legun, A.S. and Anderson, D. (1994): Geology and Mineral Deposits of Purcell Supergroup in Yahk Map Area, Southeastern British Columbia (82F/1E). *in* Geological Fieldwork 1993, Grant, B. and Newell, J.M., Editors. *B.C. Ministry of Energy, Mines, and Petroleum Resources* Paper 1994-1, p. 129-151.

Brown, D.A. and Stinson, P. (1995): Geological mapping of the Yahk map area, southeastern British Columbia: an update (82F/1E). *in* Geological Fieldwork 1994, Grant, B. and Newell, J.M., Editors. *B.C. Ministry of Energy, Mines and Petroleum Resources* Paper 1995-1, p. 111-125.

Brown, D.A., Bradford, J.A., Melville, D.M. and Stinson, P. (1995): Geology and Mineral Occurrences of the Yahk map area (82F/1E). *B.C. Ministry of Energy, Mines and Petroleum Resources* Open File 1995-14.

Brown, D.A. and Woodfill, R.D. (1998): The Moyie Industrial Partnership Project: Geology and Mineralization if the Yahk-Moyie Lake Area, Southeastern British Columbia (82F/01E, 82G/04W, 82F/09E, 82G/05W). *in* Geological Fieldwork 1997, *British Columbia Ministry of Employment and Investment* Paper 1998-1, pages 9-1 to 9-22.

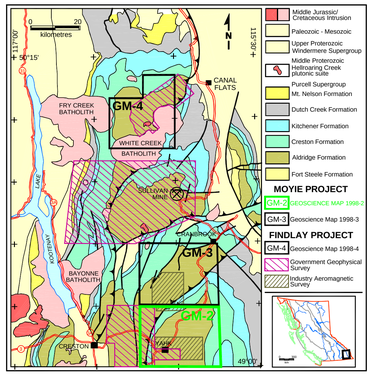
Brown, D.A., Bradford, J.A., Melville, D.M. and Stinson, P. (1995): Geology and Mineral Occurrences of the Yahk map area (82F/1E). *B.C. Ministry of Energy, Mines and Petroleum Resources* Open File 1995-14.

Cook, F.A. and Van der Velden (1995): Three-dimensional Crustal Structure of the Purcell anticlinorium in the Cordillera of Southwestern Canada; *Geological Society of America, Bulletin* v. 107, no. 6, p. 642-664.

Höy, T. (1993): Geology of the Purcell Supergroup in the Fernie West-half Map Area, Southeastern British Columbia. *B.C. Ministry of Energy, Mines and Petroleum Resources* Bulletin 84.

Lowe, C., Brown, D.A., Best, M.E., Woodfill, R., Kennedy, C. (1998): New geophysical data from the Yahk map area - part of the East Kootenay multiparameter geophysical survey. *in* Current Research, Part E *Geological Survey of Canada* Paper 98-1E.

Reesor, J. E. (1996): Geology of Kootenay Lake, B. C. *Geological Survey of Canada* Map 1864-A.

Van Andersen, P. and Nassichuk, B. (1997): Yahk Project Geology; Unpublished company map, Abitibi & Sedex Mining Corp.

REGIONAL SETTING OF MAP AREA