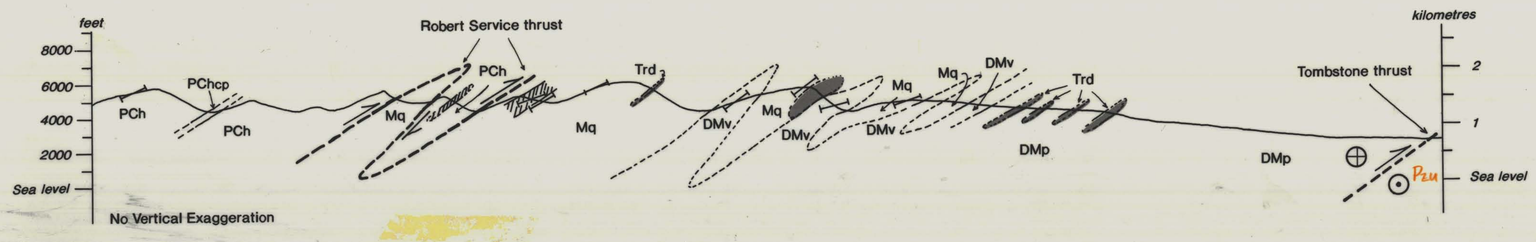
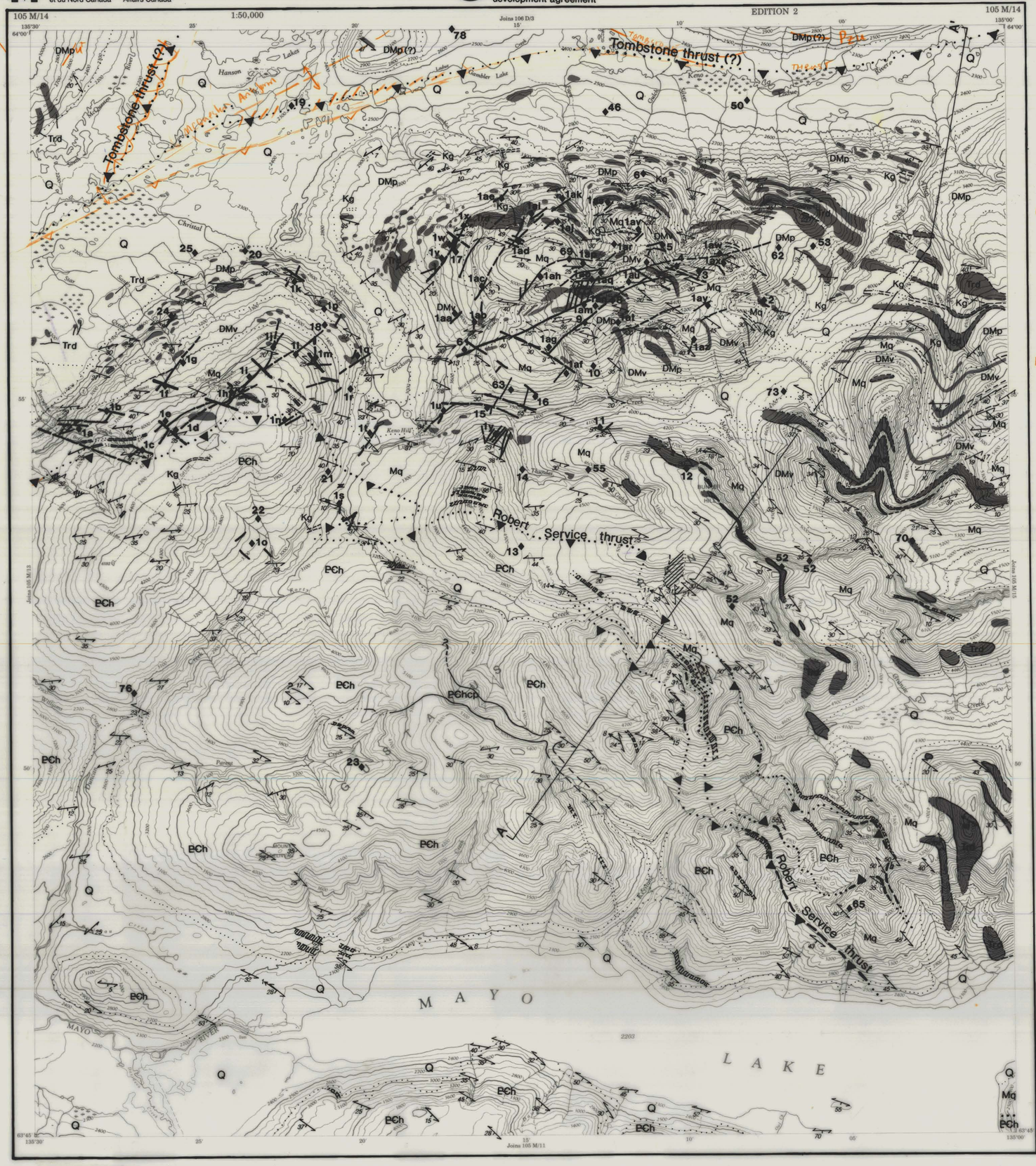


Affaires indiennes et du Nord Canada — Indian and Northern Affairs Canada

canada/yukon economic development agreement

Énergie, Mines et Ressources Canada — Energy, Mines and Resources Canada

105 M/14 — 1:50,000 — EDITION 2 — 105 M/14



KENO HILL
YUKON TERRITORY

Scale 1:50,000 Échelle

Miles 1 0 1 2 3 Miles
Metres 1000 0 1000 2000 3000 4000 Mètres
Yards 1000 0 1000 2000 3000 4000 Yards

CONVERSION SCALE FOR ELEVATIONS
Metres / Feet

This Provisional Map is equivalent to a standard map in accuracy of content.

Some names on this map are not yet official. Corrections or additions are invited by the Surveys and Mapping Branch.

CONTOUR INTERVAL 100 FEET
Elevations in feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

T.N. 67°13' 4 Mils — 34°11' 600 Mils — GRID NORTH — MAGNETIC NORTH

Use diagram only to obtain numerical values. APPROXIMATE MEAN DECLINATION 1970 FOR CENTRE OF MAP. Annual change decreasing 4.4'

Canada

LEGEND

QUATERNARY

Q — *undifferentiated unconsolidated gravels, sands, and clays*

CRETACEOUS

Kg — *dykes and sills of fine-grained, locally porphyritic, locally altered aplite and granite*

TRIASSIC

Trd — *foliation-concordant boudins of fine- to coarse-grained greenstone (actinolite-chlorite-plagioclase meta-diorite or metagabbro)*[1]

MISSISSIPPIAN

KENO HILL QUARTZITE

Mq — *finely to coarsely foliated and lineated, light to dark grey, vitreous quartzite; subordinate carbonaceous phyllite; rare limestone (diagonal ruling)*[2]

DEVONO-MISSISSIPPIAN

EARN GROUP(?)

DMv — *uggxy green, chloritic, locally porphyritic (quartz and feldspar) felsic metavolcanic phyllite*[3]

DMp — *carbonaceous phyllite, siliceous carbonaceous meta-siltstone, rare calcareous greywacke*

PRECAMBRIAN-LOWER CAMBRIAN

HYLAND GROUP

PCh — *medium brown, foliated and lineated phyllite and psammite; quartz- and feldspar-pebble psammite; diagonal rule: calc-phyllite and light grey marble; cp: carbonaceous phyllite*

Age Constraints

[1] U-Pb zircon and baddeleyite date from diorite sill in the Tombstone Mountains: 232 +1.5\-1.2 Ma (Mortensen and Thompson, 1990).

[2] Age assignment based on mid-Mississippian (Visean) conodonts recovered from Keno Hill quartzite in Ogilvie Mountains (determination by M.J. Orchard, reported in Mortensen and Thompson, 1990).

[3] This unit is correlated with felsic metavolcanic rocks of the MARG deposit from which a preliminary Early Mississippian date has been obtained (determination by J. Mortensen, reported in Turner and Abbott, 1990).

GEOLOGICAL SURVEY OF CANADA — COMMISSION GÉOLOGIQUE DU CANADA

SYMBOLS

- Geological contact (defined, approximate, projected through cover)
- Thrust fault (defined, approximate, projected through cover; teeth on upper plate)
- Fault or vein-fault, displacement unknown (defined, approximate, projected through cover)
- Prominent foliation (S_n, strike and dip) and lineation (L_n, trend and plunge); inferred to lie associated with displacement on the Tombstone thrust
- Mineral occurrence (Yukon MINFILE reference number)
- A — A' Line of cross-section
- Measured orientation of foliation (in cross-section)

NOTES

This map is based on 1991 mapping and compilation of previous Geological Survey of Canada mapping, namely McTaggart (1960), Kindle (1962), and Boyle (1965). The geology of the Keno Hill district is discussed more fully in Roots and Murphy (1992).

Keno Hill map area is underlain primarily by highly deformed rocks of four map units, the Upper Proterozoic to Lower Cambrian Hyland Group, the Devono-Mississippian Earn Group, the Mississippian Keno Hill quartzite, and Triassic diorite. These units occur in two thrust sheets, the Robert Service thrust sheet (upper) composed of the Hyland Group, and the Tombstone thrust sheet (lower), composed of the remaining units. The Robert Service thrust crosses the map area from northwest to southeast with an irregular surface trace. Folding/imbrication of the thrust during Tombstone thrust-age and younger deformation is responsible for the irregular trace of the thrust. The Tombstone thrust is inferred to lie in the northern part of the map area; presumed middle to upper Paleozoic rocks of the underlying sheet are exposed in the northernmost part of the map area.

All bedrock map units in the Keno Hill map-area (except Cretaceous intrusive rocks) are intensely foliated and lineated. Regional mapping has shown that the intensity of deformation increases from south to north towards the Tombstone thrust. Rocks north of the Tombstone thrust are only weakly deformed (Abbott, 1990; Gordey, 1990). This pattern suggests that the fabric formed during displacement on the Tombstone thrust.

Foliation and lineation are deformed by open folds with north and northwest trends. All folds and fabrics are cut by north- to northeast- and northwest-trending faults. Keno Hill vein-fault mineralization appears to have occurred primarily during north- to northeast-trending faulting (Boyle, 1965 and references therein).

MINERAL OCCURRENCES[1]

1. United Keno Hill:
   - 1a. Elsa
   - 1b. Dixie
   - 1c. Coral and Wigwam
   - 1d. Arctic and Mastiff
   - 1e. Ruby
   - 1f. No Cash
   - 1g. Betty
   - 1h. Hector
   - 1i. Calumet
   - 1j. Dragon
   - 1k. Formo
   - 1l. Galkeno-McLeod
   - 1m. Galkeno-Sime/Sugiyama
   - 1n. Eagle
   - 1o. Fisher Creek
   - 1p. Bluebird
   - 1q. Tin Can
   - 1r. Rico
   - 1s. Duncan Creek
   - 1t. Moth
   - 1u. Onek
   - 1v. Klondyke-Keno
   - 1w. Sadie-Friendship
   - 1x. Ladue
   - 1y. Bellekeno
   - 1aa. Kijo
   - 1ab. Croesus No. 1
   - 1ac. Black Cap and Shepherd
   - 1ad. Lucky Queen
   - 1ae. Lake
   - 1af. Vanguard
   - 1ag. Apex
   - 1ah. Shamrock
   - 1ai. Highlander
   - 1aj. Cub and Bunny
   - 1ak. Stone
   - 1am. No. 6
   - 1an. Porcupine-Kinman
   - 1ao. No. 9
   - 1ap. No. 1
   - 1aq. Main fault and Nabob
   - 1ar. Lake View
   - 1aa. Nabob No. 2
   - 1at. Helen Fraction
   - 1au. Gold Hill No. 2
   - 1av. Fox
   - 1aw. Alice
   - 1ax. Caribou
   - 1ay. Divide
   - 1az. Devon
2. Faith
3. Duncan
4. Gold Queen
5. Silver Basin
6. Nabob
7. Monument
8. Comstock
9. Apex
10. Vanguard
11. Homestake
12. Christine
13. Mo
14. Maybrun
15. Hogan
16. Runer
17. Wernecke
18. Formo (different from 1k)
19. Nomad
20. Paddy
21. Eagle
22. Fisher
23. Parent
24. Cream and Jean
25. Nord
46. Moon
50. Nero
52. Mt. Hinton
53. Avenue
55. Yono
61. Christal
62. Segsworth
63. Ironclad
65. Nadar
69. Gambler
70. Havrenak
73. Bema
76. Goldrock
78. Feed

[1] Numbered with Yukon MINFILE reference numbers. Letters following the numbers are informal and are used to locate individual occurrences within the United Keno Hill Mines holdings. Names and locations of UKHM holdings are from Boyle (1965).

REFERENCES

Abbott, J.G. 1990: Geological map of Mt. Westman map area (106D/1), Yukon; Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1990-1.

Boyle, R.W. 1965: Geology, geochemistry, and origin of the lead-zinc-silver deposits of the Keno Hill-Galena Hill area, Yukon Territory; Geological Survey of Canada, Bulletin 111.

Gordey, S.G. 1990: Geology of Tiny Island Lake map area (105M/16), Yukon; Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1990-2.

Green, L.H. 1971: Geology of Mayo Lake, Scougale Creek and McQuesten Lake map areas, Yukon Territory (105M/15, 106D/2, 106D/3); Geological Survey of Canada, Memoir 357.

Kindle, E.D. 1962: Geology, Keno Hill, Yukon Territory; Geological Survey of Canada, Map 1105A.

McTaggart, K.C. 1960: The geology of Keno and Galena hills, Yukon Territory (105M); Geological Survey of Canada, Bulletin 58.

Mortensen, J.K. and Thompson, R.I. 1990: A U-Pb zircon-baddeleyite age for a differentiated mafic sill in the Ogilvie Mountains, west-central Yukon Territory; *in* Radiogenic Age and Isotopic Studies: Report 3, Geological Survey of Canada, Paper 89-2, p. 23-28.

Roots, C.F. 1990: Geology of 106D/8 and 106D/7 (east-half) map areas; Exploration and Geological Services Division, Yukon, Indian and Northern Affairs, Canada, Open File 1990-3.

Roots, C.F. and Murphy, D.C. 1992: New developments in the geology of Mayo map area, Yukon Territory; *in* Current Research, Part A, Geological Survey of Canada, Paper 92-1A, p. 163-171.

Turner, R.J.W. and Abbott, J.G. 1990: Regional setting, structure, and zonation of the Marg volcanogenic massive sulphide deposit, Yukon; *in* Current Research, Part E, Geological Survey of Canada, Paper 90-1E, p. 31-41.

ACKNOWLEDGEMENTS

This project was funded by the 1991-1996 Canada-Yukon Economic Development Agreement. Discussions with Grant Abbott of Northern Affairs Canada and Steve Gordey of the Geological Survey of Canada were helpful in forming our interpretation of this region. The authors are grateful to Lasha Reid, Archer Cathro and Associates, and Trans North Air.

106D/6	106D/7	106D/8 *Roots (1990)*
106D/3 *Green (1971)*	106D/2 *Green (1971)*	106D/1 *Abbott (1990)*
105M/14 *This Study*	105M/15 *Green (1971)*	105M/16 *Gordey (1990)*
105M/11	105M/10	105M/9

Indian and Northern Affairs Canada
Exploration and Geological Services Division
Yukon Region

Open File 1992-3

GEOLOGY OF KENO HILL MAP AREA (105M/14)

by

Donald C. Murphy and Charlie F. Roots
Geological Survey of Canada