

**CROSS SECTION NOTES** 

(These notes refer to circled numbers on the cross section)

Dotted form lines indicate orientation of foliation (S1). The foliation is folded by small and

Thin, solid form lines schematically indicate folded bedding. Observed folds have axial planes parallel with regional foliation. Inclined short, solid lines at surface of profile are true dips, where measured near line of section.

Bottom part of section is not to scale.

Keno Ladue R.

COMMISSION GÉOLOGIQUE DU CANADA

Leech et al. 1963

Nadaleen R.

Blusson, 1974

Lansing

105N

Tay River

Gordey and

Irwin, 1987

Blusson, 1974

Numbered squares indicate

1:50 000 geology maps:

1,2 - Poole, 1965

3,4,5 Green, 1971

6 - Abbott, 1990

8 - Kindle, 1962;

- Gordey, 1990

Murphy and Roots, 1992

89.0 ± 2.6 Stevens et al. 1982

97.1 ± 3.6 Stevens et al. 1981

90.1 ± 1.4 Hunt et al. 1987

Regional Bedrock Geology maps

. 1 8 3

105M

Bostock, 1947

Green, 1972

McQuesten

115P

Carmacks

Kluit, 1984

1151

Bostock, 1964

GEOLOGICAL SURVEY OF CANADA

Robert Service Thrust surface was deformed both during and after motion on the Tombstone thrust. This interpretation is based upon:

a. Rocks that appear to overlie the "Keno Hill quartzite" vary in composition and degree of deformation (Green, 1971, p. 55). Alternating layers of quartzite (Keno Hill) and schist (Hyland Group) near Sourdough Hill and Mount Hinton could be separated by tight folds or splays of the Robert Service Thrust (Roots and Murphy,

b. Small lenses of DMp within Hyland Group south of Tiny Island Lake (Gordey, 1990) are interpreted as structural inliers of the footwall of Robert Service Thrust.

c. Recognition of Keno Hill quartzite, in addition to DMv and DMp (Earn Group) in NW corner of map. This may be an inverted succession of footwall rocks, which implies that the overlying Robert Service fault surface is overturned.

d. All Hyland Group rocks in the central part of the map area, and as far south as Avalanche Creek, are highly strained but no higher than lower greenschist grade. These rocks appear to have been deformed after they were raised to shallow depth; perhaps by northward thrust motion (Robert Service Thrust) over a ramp which currently underlies the northern limit of unstrained Paleozoic strata.

Mayo Lake anticline, recognized by Bostock (1947) and Green (1971), plunges SE at 25°. It probably formed after the Tombstone Thrust, and may be structurally related to the

Isoclinal folds with both north- and south-vergence and 10-300 m amplitude are visible in outcrops along rapids of Stewart River.

Three granitic stocks and fine-grained felsic intrusions form a west-northwest trend across the map south of Stewart River.

A prominent break in slope in the Avalanche Creek area is here interpreted as a gently dipping thrust. The hanging wall consists of nearly flat-lying sandstone (cliffs 200 m high) but a topographic bench at their base exposes underlying steeply dipping, strongly deformed phyllite and schist. The contact has not been located. If it is a thrust, large klippen exist in Mayo map area. The contact might, however, be an angular unconformity, with implications for timing of deformation in the Hyland Group.

The metamorphic aureole (dark hornfels; may contain cordierite) obscures relations around McArthur pluton. The intrusive contact is vertical where observed in north-facing cirques.

10 These rocks have not been visited by the authors.

### REGIONAL SETTING

This new synthesis incorporates the early work of Bostock (1947) in addition to the larger scale mapping in the north quarter of the area (see diagram), combined with new field observations in 1990 and 1991.

Mayo map area contains the eastern ends of two laterally extensive structural sheets that moved northward, first on the Robert Service thrust (Green, 1972) and later on the Tombstone thrust (Roots, 1991; Roots and Murphy, 1992). The southern structural sheet is the hanging wall of the Robert Service Thrust. It includes Hyland Group clastic rocks (Gordey, in press) and middle Paleozoic basinal strata. These units can be traced from the Macmillan Pass area (180 km to the southeast) across Mayo map area and are truncated by the Tintina Fault west of the the McArthur Group mountains. The Hyland Group is increasingly foliated and recrystallized northward (toward Mayo Lake); this may indicate that the Robert Service Thrust is relatively shallow beneath the central part of the map-area.

The northern third of the map-area is the hanging wall of the Tombstone Thrust (Mortensen and Thompson, 1990). It includes the Keno Hill quartzite and older Earn Group schist and phyllite that were mobilized northwest, then northeast (Roots and Murphy, 1992). Abundant Triassic mafic intrusions lie within this structural sheet, and all rocks are highly strained. The Tombstone Thrust may intersect the surface near the north edge of the map-area because rocks to the north (in the footwall) are only weakly deformed (Abbott, 1990).

Several quartz monzonite stocks intrude the structural sheets. In age and composition the stocks are similar to the Selwyn Plutonic Suite (Anderson, 1987), but metallic mineralization is less common. Ag-Pb-Zn vein mineralization in the Keno Hill camp is derived from a mesothermal system driven by the Roop Lakes pluton (Lynch, 1986, 1989) along faults and fractures of a northeast-trending sinistral brittle shear zone (Roots and Murphy, 1992).

## SYMBOLS

| Geological contact (defined, approximate, assumed)                |               |  |
|---|---------------|--|
| Bedding (tops unknown, known, vertical, overturned)               |               |  |
| Foliation (inclined, vertical)                                    |               |  |
| Lineation (mineral streaking)                                     | 1             |  |
| Antiform or anticline (trace of axial plane; upright, overturned) |               |  |
| Synform or syncline (trace of axial plane; upright, overturned)   | X             |  |
| Fault, displacement unknown (exposed, inferred)                   |               |  |
| Thrust fault (approximate, assumed, overturned)                   | <b>*-*</b> *- |  |
| Mineral occurrence (Yukon Minfile number)                         | •40           |  |

## MINERAL OCCURRENCES1

|  | MINTERIAL  | COCONNENCES  |
|--|--|--|
| 3.<br>4.<br>5.<br>6.<br>7.<br>8.<br>9.<br>10<br>111<br>122<br>13<br>144<br>15<br>16<br>17<br>18<br>19<br>20<br>21<br>21<br>22<br>23<br>24<br>25<br>26.<br>27<br>28.<br>30<br>31.<br>32.<br>33.<br>34.<br>35.<br>36.<br>37.<br>38.<br>39.<br>39.<br>39.<br>39.<br>39.<br>39.<br>39.<br>39.<br>39.<br>39 | UNITED KENO HILL (Ag,Pb,Zn veins; Ho<br>FAITH (Ag,Pb - Vein)<br>DUNCAN (Ag,Pb - Vein)<br>GOLD QUEEN (Ag,Pb - Vein)<br>SILVER BASIN (Pb,Ag,Au - Vein)<br>NAROB (Ag,Pb - Vein) | 46. MOON (Ag,Pb - Vein) 47. MT. ALBERT (Ag,Pb - Vein) 48. McKIM (Ag,Pb - Vein) 49. VACA 50. NERO (Ag,Pb - Vein) 51. FRIESEN (Cu,W - Skn0 52. MT. HINTON (Au,Ag - Vein) 53. AVENUE (Ag,Pb - Vein) 54. CHANCE (Sb - Vein) 55. YONO (Ag,Pb - Vein) 56. SUNDOWN (Ag,Pb - Vein) 57. GUSTAVUS (Ag,Pb - Vein) 58. HALFWAY 59. RANKIN 60. NEWRY 61. CHRISTAL (Ag,Pb,Zn - Vein) 62. SEGSWORTH (Ag,Pb,Zn - Vein) 63. IRONCLAD (Ag,Pb,Zn - Vein) 64. WALLINGHAM 65. NADAR 66. KALZAS (W,Sn - Vein) 67. CORKERY 68. WEASEL 69. GAMBLER (Ag,Pb - Vein) 70. HAVRENAK (Au,Ag - Vein) 71. DRILL (W - Vein) 72. BELEY (Zn - Vein) 73. BEMA (Au,Ag - Vein) 74. BIRGIT 75. WHITEMAN 76. GOLDROCK 77. T-BIRD 78. FEED 79. TINY ISLAND (Ba - Form) 80. GORDEY (Ba - Form) |
| 43.  | LOST WERNECKE COPPER (Cu - Un)   | <sup>1</sup> Numbered with Yukon MINFILE reference nun<br>(105M)   |

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# **GEOLOGY OF MAYO MAP AREA (105M)**

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This Open File map and Open File 1992-3 (Geology of Keno Hill) by D.C. Murphy and C. Roots are products of the Canada-Yukon Cooperation Agreement on Mineral Resources 1991-1996, administered by:

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