Base from U.S. Geological Survey
Wilborn 7.5' topographic quadrangle
Map date: 1968 Field Checked: 1968
Projection: Polyconic 1927 NAD
UTM grid declination 0°57' West
1968 Magnetic North Declination 19° East

N

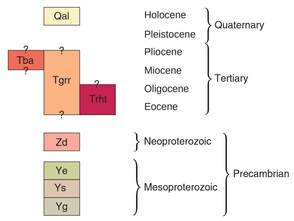
SCALE 1:24,000

1 MILE 1/2 0
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

Maps may be obtained from:
Publications Office
Montana Bureau of Mines and Geology
1300 West Park Street
Butte, Montana 59701-8997
Phone: (406) 496-4174 Fax: (406) 496-4451
http://mbmg.mtech.edu

CORRELATION DIAGRAM



MAP SYMBOLS

Contact: dashed where approximately located

Normal fault: dashed where approximately located; dotted where concealed, bar and ball on downthrown side

Reverse or thrust fault: teeth on upthrown block; dashed where approximately located; dotted where concealed

44 Strike and dip of inclined beds

UNIT DESCRIPTIONS

Qal **Alluvium (Holocene and Pleistocene)**—Cobbles, gravel, sand, silt, and clay; poorly to moderately sorted, unconsolidated; includes colluvium that has migrated down into stream valleys.

Tba **Basalt (Late Tertiary?)**—Black, occurs as a small plug associated with faulting in the southern part of the quadrangle.

Tgrr **Granite/rhyolite (Tertiary?)**—Granite to rhyolite: pink, phaneritic to aphanitic, in oval plugs in the southern part of the quadrangle. The largest plug, in the southwestern part of the quadrangle, is exposed as highly weathered, fine-grained granite boulders.

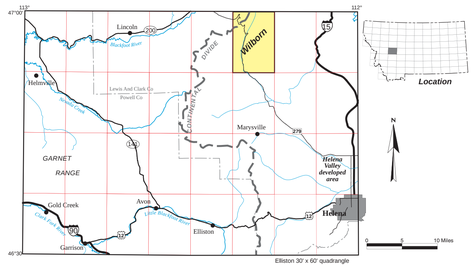
Trht **Rhyodacite tuff of Crater Mountain volcanics (Oligocene? and Eocene)**—Rhyodacite tuff: gray and pale pink, contains subhedral to euhedral crystals of quartz and sanidine. Occurs as plugs in the southwestern corner of the quadrangle. Largest plug appears to be a volcanic neck with relief of more than 213 m (700 ft), and a diameter of more than 762 m (2,500 ft).

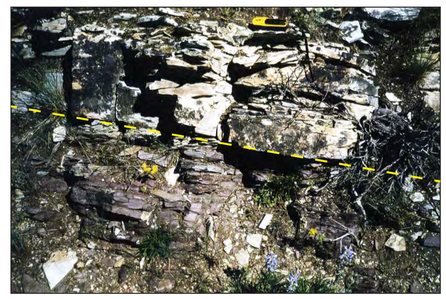
Zd **Diorite sills (Neoproterozoic)**—Diorite: dark gray to greenish black, medium-grained equigranular, composed of andesine-labradorite, augite, biotite, and magnetite. Weathers to characteristic light rusty brown soil. Sills commonly 60–137 m (200–450 ft) thick, and are found only within the Spokane Formation within the quadrangle.

Ye **Empire Formation, Belt Supergroup (Mesoproterozoic)**—Argillite and shale, grayish green and light green, laminated to thin bedded with a few individual beds thicker than 1 m (3 ft). Only lower part exposed in the quadrangle. Maximum exposed thickness approximately 244 m (800 ft) present in central-eastern part of the quadrangle.

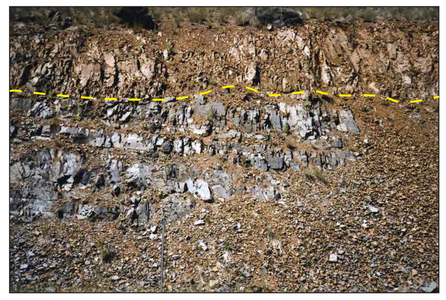
Ys **Spokane Formation, Belt Supergroup (Mesoproterozoic)**—Argillite and shale, primarily maroon with minor red fine-grained sandstone beds. The shale is ripple-marked on some layers, and displays mud cracks on others. Minor thin beds of dark green shale and siltstone are locally present throughout the formation. Where intruded by diorite sills, the Spokane becomes increasingly dark towards the sill on either side. The normally maroon argillite becomes light purple, then dark purple, then dark gray, then black just before the contact with the sill. Relict bedding is present in the dark zone. The color change begins approximately 30–60 m (100–200 ft) away from the upper and lower contact with the sill. Formation thickness approximately 305–610 m (1,000–2,000 ft) in the quadrangle; thicker in adjacent quadrangles.

Yg **Greyson Formation, Belt Supergroup (Mesoproterozoic)**—Argillite, shale, and sandstone; primarily interbedded dark greenish gray and blackish gray argillite and thin- to medium-bedded sandstone. The argillite beds normally weather to buff yellow, suggesting the presence of dolomitic beds. Only the top of formation exposed along the Scapegoat and Hoadley thrust faults. Maximum thickness about 91 m (300 ft).





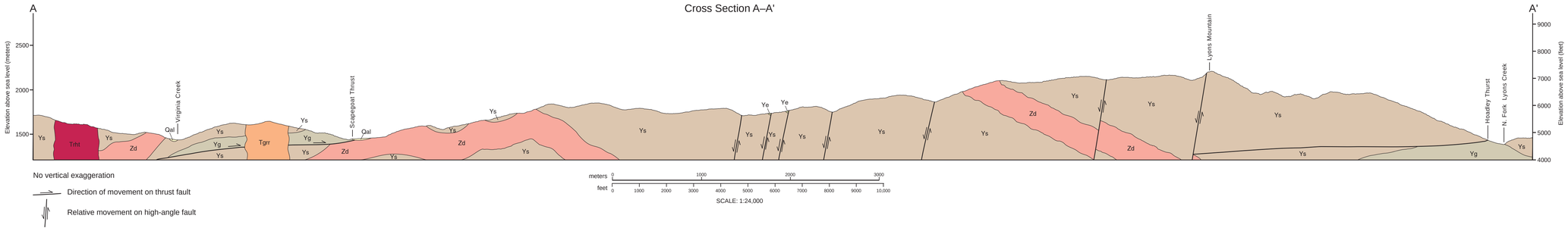
Contact between the green Empire Formation (above) and the underlying maroon Spokane Formation. Located on slope in NW¼ sec 31, T. 14 N., R. 5 W.



Contact between diorite sill above meta-argillite of the Spokane Formation. Located on the northern shoulder of US 279 in the SW¼ sec 23, T. 14 N., R. 6 W.

Shears in the Spokane Formation on the lower block of the Scapegoat Thrust (pencil shows shear planes).

Cross Section A–A'



No vertical exaggeration

Direction of movement on thrust fault

Relative movement on high-angle fault

meters 0 1000 2000 3000
feet 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000

SCALE: 1:24,000

GIS production: Yiwen Le and Paul Thale, MBMG. Map layout: Susan Smith, MBMG.

MBMG
Montana Bureau of Mines and Geology

MBMG Open-File Report 691

Geologic Map of the Wilborn 7.5' Quadrangle, West-Central Montana

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2017