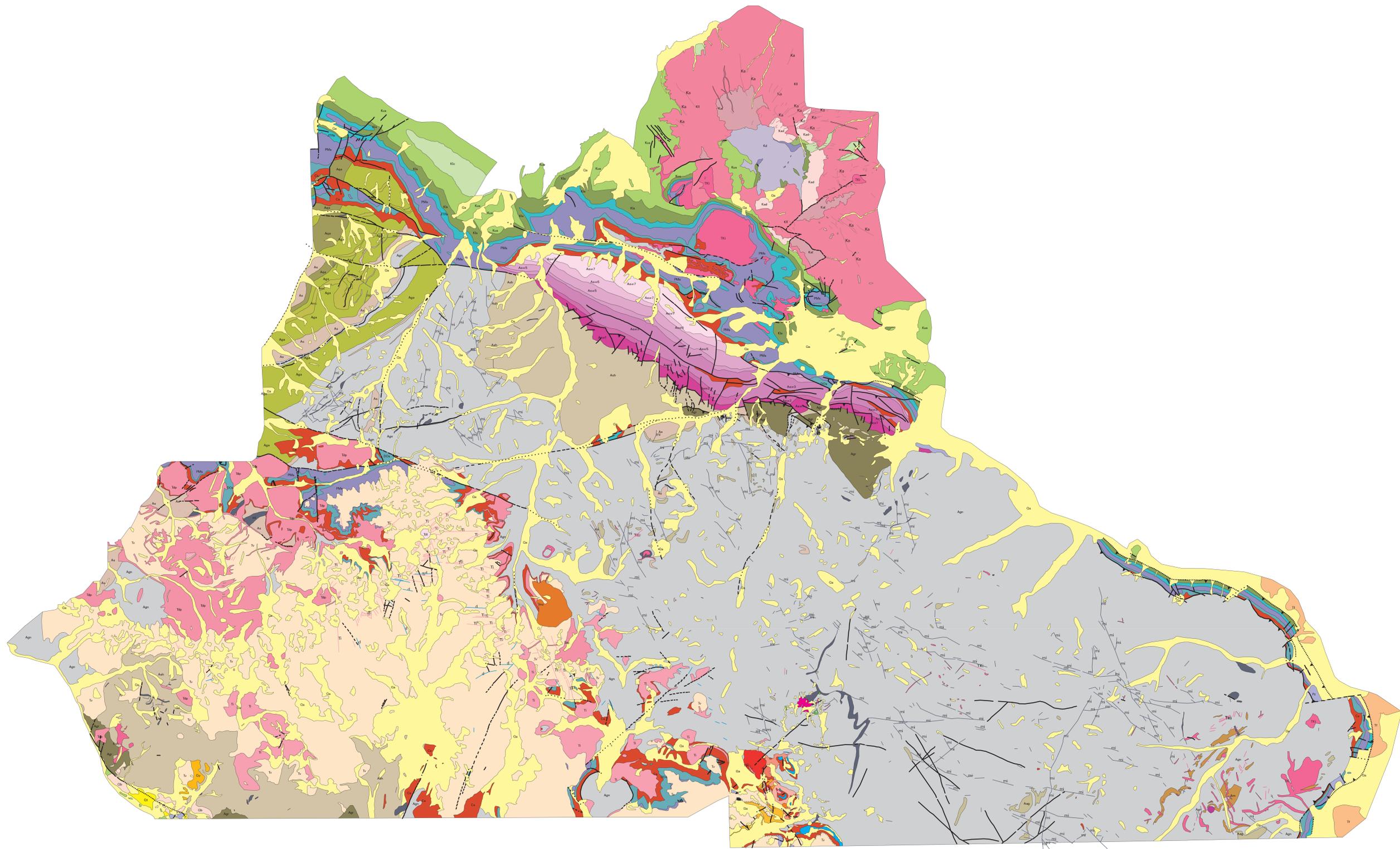


Generalized Geologic Map of the Absaroka-Beartooth Study Area, South-Central Montana

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DESCRIPTION OF MAP UNITS

SEDIIMENTARY AND VOLCANIC ROCKS

- Qc Surficial deposits (Quaternary)—Alluvium in stream channel, flood plain, and terrace; dunes, colluvium, and beach deposits; glacial deposits of till, sand, gravel, and silt; and glacial deposits of sand, gravel, and silt
- Qt Tertiary (Quaternary)
- Dy Lava flow of Yellowstone Group (Pliocene)—Rhyolite ash-flow tuff in Gardner area
- Ob Basalt (Pliocene)—Basalt flows in Gardner area
- Tr Absaroka Volcanic Subgroup (Eocene)—Volcanic and volcanoclastic rocks including tuffaceous sandstone, and dacite flow and flow breccia; basaltic andesite and andesite; and minor andesite and diorite intrusive bodies
- Ft Fort Union Formation (Pliocene and Late Cretaceous)—Conglomerate, sandstone, and shale
- Kal Andesite (Late Cretaceous)—Lava flows in Siderock Mountain area
- K3 Lava of Livingston Group (Late Cretaceous)—Lava breccia, mostly composed of minor andesite and andesite tuff, lava flows, and flow breccias and andesite conglomerate, sandstone, siltstone, and mudstone
- K2 Sedimentary rocks of Livingston Group (Late Cretaceous)—Epidioritic conglomerate, sandstone, siltstone, and mudstone
- K1 Andesite (Late Cretaceous)—Lava flows and flow breccia, at or near base of Livingston Group
- Rss Sedimentary rocks (Late Cretaceous)—Includes Eagle Sandstone, Highgate Creek Formation, Clay Shale, Frontier Formation, and Montana Formation sandstone and shale
- K5 Sedimentary rocks (Early Cretaceous)—Includes Murrey Shale, Thermopylae Shale, Soudan Formation, and Clifty Formation sandstone, siltstone, and conglomerate
- K4 Sedimentary rocks (Early and Late Cretaceous)—Sandstone, shale, breccia, and conglomerate
- J76a Sedimentary rocks (Jurassic and Triassic)—Includes Morrison Formation, Elk Group, and Chugwater Formation sandstone, shale, and breccia
- PMa Sedimentary rocks (Permian, Pennsylvanian, and Mississippian)—Includes Cheyenne, Quaternary, and Fremont Formations and Madison
- DCa Sedimentary rocks (Devonian and Ordovician)—Includes Siphon Dolomite, Onondaga, Quaternary, and Fremont Formations and Madison
- OCa Sedimentary rocks (Ordovician and Cambrian)—Includes Siphon Dolomite, Onondaga, Quaternary, and Fremont Formations and Madison
- Ca Sedimentary rocks (Cambrian)—Includes Green Creek Formation, Snowy Range Formation, Mazon Limestone, Park Shale, and Highgate Sandstone, siltstone, and shale
- Pr Unfossiliferous sedimentary rocks (Precambrian)

INTRUSIVE ROCKS AND BRECCIA (TERTIARY AND CRETACEOUS)

- Ti Intermediate and felsic rocks (Eocene)—Dikes, sills, and irregular bodies; contains abundant rounded, conchoidal, and angular quartzite pebbles
- Tp Rhyolite porphyry of Lulu Pass (Eocene)—Lacolith and dikes
- Tb Breccia of Horsetail mine area (Eocene)—Eruption-collapse breccia pipe composed of blocks of various sedimentary rocks, porphyritic rhyolite, andesite, and quartzite; contains abundant rounded, conchoidal, and angular quartzite pebbles and rounded, irregularly shaped, angular andesite and quartzite pebbles
- Tc Breccia of Hill area (Eocene)—Composed of breccia composed of blocks of various sedimentary rocks in patterned rock; four dikes of rhyolite and quartzite intrude
- Th Rhyolite porphyry of Henderson Mountain (Eocene)—Stock and dikes
- Td Rhyolite porphyry of Horsetail mine area (Eocene)—Stock, sills, dikes, and irregular bodies; contains abundant rounded, conchoidal, and angular quartzite pebbles; contains andesite and locally rhyolite
- Tf Complex of Fisher Mountain area (Eocene)—Stock of felsic rhyolite porphyry and andesite; contains abundant rounded, conchoidal, and angular quartzite pebbles; contains andesite and locally rhyolite
- Tg Dike of South River Mountain (Eocene)—Stock and irregular-shaped intrusions and dikes
- Ta Andesite and trachyandesite porphyry (Eocene)—Dike in Cooke City area
- Tp Granite porphyry of Emigrant area (Eocene)—Stock near head of Emigrant Creek
- Td Dike porphyry (Eocene)—Stock, lacoliths, sills, dikes, and irregular-shaped bodies; contains andesite and locally rhyolite
- Tf Dike porphyry and basaltic andesite (Eocene)—Small stock for a dike at head of Hill Creek and along northeast of Cooke City
- Tm Monzonite of Independence area (Eocene)—Stock composed of multiple phases of andesite, intrusive breccia, microdiorite, and quartzite; contains andesite and quartzite pebbles; cut by minor granite dikes
- TG Intermediate and felsic intrusive rocks (Eocene or Late Cretaceous)—Includes andesite, dacite, and quartzite; contains andesite and quartzite pebbles of fine-grained and porphyritic rhyolite, dacite, quartzite, andesite, and diorite
- Ks Andesite (Late Cretaceous)—Dikes in Siderock Mountain area
- K6 Dike of Siderock Mountain (Late Cretaceous)—Stock, variable grain size and textures may indicate multiple phases, locally altered
- K1 Rhyolite and quartzite porphyry (Late Cretaceous)—Sills, dikes, and irregular-shaped bodies in Glass Lake area
- K2 Dike of Glass Lake (Late Cretaceous)—Stock composed of multiple phases of quartzite and microcline of variable grain sizes and textures; locally altered and mineralized
- d Intermediate and mafic intrusive rocks (Eocene and Precambrian)—Dikes and sills of andesite and basalt

INTRUSIVE ROCKS (PRECAMBRIAN)

- ni Mafic intrusive rocks (Gardiner and Precambrian)—Includes sills, dikes, and irregular-shaped bodies of andesite, basalt, and quartzite; contains andesite and quartzite pebbles and dikes of andesite or trachyandesite
- ahd Horsetail quartz diorite (Archaean)—Small bodies associated with quartz monzonite of Siderock area
- agp Granitic intrusion rocks (Archaean)—Includes stocks and irregular-shaped bodies of fine-grained, coarse-grained quartz monzonite and diorite of the Siderock area and of granite in the Gardner area

Siderock Igneous Complex (Archaean)—Stock forms nuclei to ultramafic rocks; dikes are seen only as follows:

- Aw7 Upper mixed, upper gabbro, and upper anorthosite zone
- Aw6 Middle anorthosite zone
- Aw5 Lower mixed, middle gabbro, and middle mixed zones
- Aw4 Lower anorthosite zone
- Aw3 Horle and lower gabbro zones
- Aw2 Bronzite zone
- Aw1 Peridotite zone
- Ar Metacrinite and metagabbro (Archaean)—Stock
- Agp Granitic gneiss (Archaean)—Predominantly granitic gneiss and migmatite; contains andesite and quartzite pebbles; contains andesite and quartzite pebbles; contains andesite and quartzite pebbles
- Au Ultramafic rocks (Archaean)—Irregular-shaped bodies and lenses of ultramafic rocks and serpentinite

METASEDIMENTARY AND METAMORPHIC ROCKS (PRECAMBRIAN)

- Ar Biotite schists (Archaean)—Includes minor quartzite, iron formation, and amphibolite
- Amg Amphibolite and hornblende gneiss (Archaean)—Tabular and banded bodies enclosed in granitic gneiss and migmatite
- Agp Amphibolite and gneiss (Archaean)—Includes hornblende gneiss, amphibolite, and quartzite; contains andesite and quartzite pebbles; contains andesite and quartzite pebbles
- Amc Nappe zone complex (Archaean)—Includes Barney Creek Amphibolite, George Lake Schist, and Grand Quartzite, amphibolite, siltstone, quartzite, and iron formation
- Amq Quartzite and amphibolite (Archaean)—Inclined quartzite and orthoamphibolite; minor schist
- Ash Schist and hornblende (Archaean)—Metasedimentary rocks consisting predominantly of schist and hornblende with minor quartzite, amphibolite, and iron formation; contains metamorphosed and mineralized bodies of andesite and quartzite; contains andesite and quartzite pebbles; contains andesite and quartzite pebbles
- An Unfossiliferous metamorphic rocks (Archaean)—Includes amphibolite, microcline quartzite, and some gneiss; also includes some small bodies of quartzite-bearing gneiss

This map was digitally compiled from base materials used to create the "Generalized geologic map of the Absaroka-Beartooth study area, south-central Montana" in plate 1 of U.S. Geological Survey Open-File Report 93-207.

