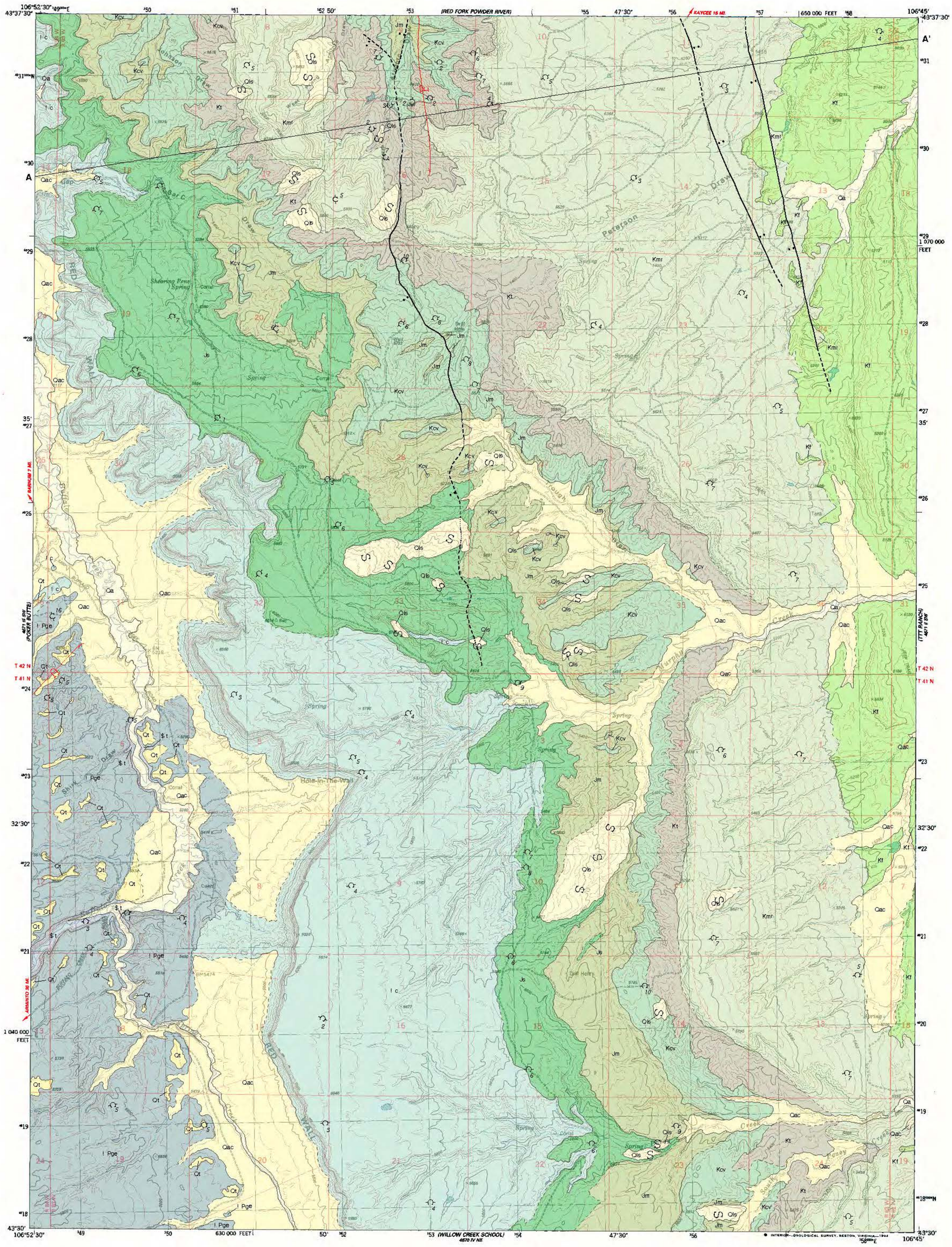
WYOMING STATE GEOLOGICAL SURVEY
Lance Cook, State Geologist
Laramie, Wyoming

Geology - Interpreting the past to provide for the future

USGS science for a changing world
Prepared in cooperation with the
U.S. GEOLOGICAL SURVEY

OPEN FILE REPORT 04-12
Hole In The Wall 1:24,000 - scale Geologic Map



Projection: Universal Transverse Mercator (UTM), zone 13
North American Datum of 1927 (NAD 27)
10,000-foot grid ticks:Wyoming State Plane Coordinate System, East zone

A digital version of this map is also available on CD-ROM.

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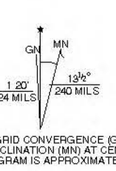
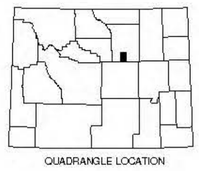


UTM GRID CONVERGENCE (GN)
1982 MAGNETIC DECLINATION (MN) AT CENTER OF SHEET
DIAGRAM IS APPROXIMATE

SCALE 1:24,000

1 0.5 0 1 Miles
1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet
1 0.5 0 1 Kilometers

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



QUADRANGLE LOCATION

Digital cartography by Justin M. Mulbay

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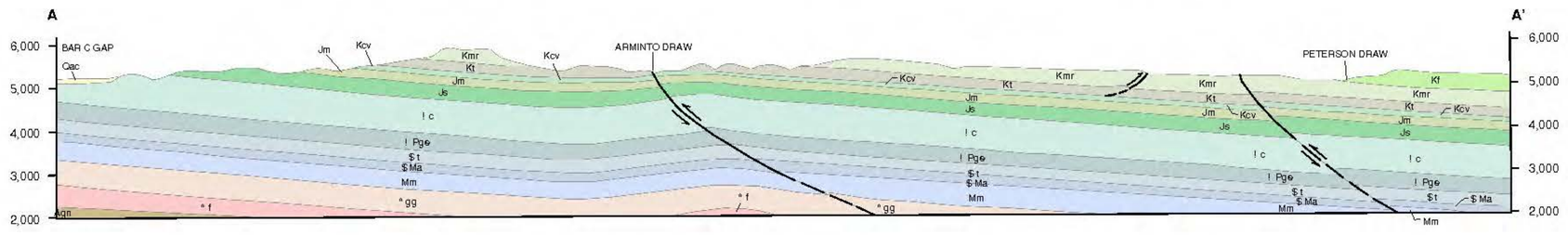
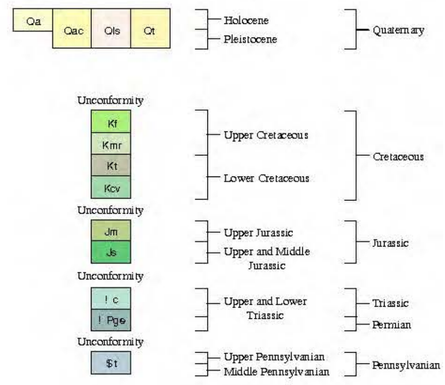


GEOLOGIC MAP OF THE HOLE IN THE WALL QUADRANGLE, JOHNSON COUNTY, WYOMING

by
Alan J. Ver Ploeg
2004

EXPLANATION

CORRELATION OF MAP UNITS



MAP SYMBOLS

Formation Contact

Fault Bar and ball on downthrown block; arrows indicate relative direction of oblique-slip movement. No indication on fault trace indicates undetermined motion. Dashed where approximately located and dotted where concealed.

Anticline Trace of axial plane and direction of plunge compiled from source mapping or determined by field dip measurements and by photo interpretation.

Monocline Trace of axial plane compiled from source mapping or determined by field dip measurements and by photo interpretation. Arrows point in direction of dip.

DESCRIPTION OF MAP UNITS

Qa **Alluvial deposits (Holocene)**--Unconsolidated and poorly consolidated clay, silt, sand, and gravel, mainly in floodplains and lowest Holocene stream terraces. Thickness 0 to 50 feet.

Qac **Mixed alluvium and colluvium (Holocene/Pleistocene)**--Sand, silt, clay, and gravel deposited mainly along intermittent streams; includes slope wash and smaller alluvial fan deposits that coalesce with alluvium. Thickness approximately 0 to 50 feet.

Qls **Landslide deposits (Holocene/Pleistocene)**--Blocks of bedrock or loose slope debris; arrows point in the inferred direction of movement. Occur in the Mowry, Thermopolis, Morrison, and Sundance shales.

Qt **Terrace deposits (Pleistocene)**--Beds of coarse sand and gravel with occasional boulders and lenses of silt and clay. Includes fragments of weathered sandstone and limestone cobbles, predominance varies depending on source of feeding stream. Occur along Buffalo Creek, 80 feet to over 350 feet above modern flood plain. Thickness approximately 0 to 10 feet.

UNCONFORMITY

Kf **Frontier Formation (Upper Cretaceous)**--Gray to black shale and siltstone, bentonite beds, and "salt and pepper" sandstones. First Wall Creek Sandstone Member forms top and Second Wall Creek Sandstone Member occurs lower in the section. Thickness is 800 to 850 feet.

Kmr **Mowry Shale (Upper Cretaceous)**--Hard, dark gray, siliceous shale with numerous fish scales and interbedded bentonite beds. Weathers to a characteristic silver-gray color. Black, hard shale in lower portion of the section. Contact with overlying Frontier Formation is at the base of the persistent "Clay Spur Bentonite". Thickness approximately 350 feet.

Kt **Thermopolis Shale and Muddy Sandstone (Lower Cretaceous) undivided**--Gray to black, soft, fissile shale. Lower dark gray shale contains numerous dahlite concretions. Muddy Sandstone, a fine- to medium-grained brown to gray sandstone, occurs at the top of this sequence and is mapped with it. Thickness 160 to 200 feet.

Kcv **Cloverly Formation (Lower Cretaceous)**--"Rusty Beds" at top are tan to black shale interbedded with siltstone and fine-grained sandstone. Lower portion is white to gray sandstone; variegated, brightly colored claystone, and locally, a chert pebble conglomerate at the base. Thickness is 100 to 140 feet.

UNCONFORMITY

Jm **Morrison Formation (Upper Jurassic)**--Upper portion composed of variegated light green and pink claystone, siltstone, and siliceous channel sandstones. Dinosaur bones and bone fragments are common in the upper portion of the section. Lower portion includes calcareous sandstone, shale, and mudstone. Thickness is 170 to 220 feet.

Js **Sundance Formation (Upper and Middle Jurassic)**--Olive green, glauconitic, silty shale with minor sand lenses in upper portion. Locally, a thin gray coquinal limestone occurs at the top of the sequence. Lower portion primarily yellowish gray, fine-grained sandstone. Middle portion can contain a thin fossiliferous limestone. Total thickness up to 350 feet.

UNCONFORMITY

I c **Chugwater Formation (Triassic)**--Members included from top to bottom are Crow Mountain Sandstone-reddish orange fine-grained, calcareous sandstone; Alcova Limestone-prominent 5 to 10 foot thick purplish gray limestone; and Red Peak Shale-red shale and siltstone with some fine-grained sandstone. Forms the prominent features known as the Red Wall and the famous Hole-in-the-Wall. Thickness is 750 to 850 feet.

I Pge **Goose Egg Formation (Lower Triassic and Permian)**--Dark red to reddish orange shale and siltstone with interbedded gypsum, limestone, and dolomite, mainly in the lower portion. Formation thickness is 300 to 350 feet.

UNCONFORMITY

$ t **Tensleep Sandstone (Pennsylvanian)**--White to buff, medium- to very fine-grained, massive sandstone; interbedded with thin limestone and dolomite beds, especially toward the base. Upper and middle sandstones are usually characterized by large-scale crossbeds. Thickness is 350 to 400 feet.

UNCONFORMITY

O° gg **Gallatin Limestone (Lower Ordovician and Upper Cambrian) and Gros Ventre Formation (Upper and Middle Cambrian) undivided** Uppermost unit (Gallatin Limestone) contains resistant grayish red limestone and thin beds of flat-pebble conglomerate underlain by olive green to yellowish brown, glauconic shale and siltstone. The middle unit (Gros Ventre Formation) includes light gray limestone, and silty and glauconitic, interbedded with soft gray shale and beds of flat-pebble conglomerate. The basal unit (Gros Ventre Formation) consists of yellowish brown to reddish brown medium- to coarse-grained glauconitic sandstone. The two formations are not distinguishable for mapping purposes in this area, occurring only at the upper reaches of the Middle Fork of the Powder River, on the west side of the map. Thickness up to 580 feet (only shown on cross-section, unit does not crop out on map).

° f **FLATHEAD SANDSTONE (MIDDLE CAMBIAN)** Reddish gray, tan, and light brown medium to coarse-grained quartz sandstone in beds as much as 3 feet thick; locally conglomeratic and crossbedded. Thin interbeds of green, maroon, and tan siltstone, mainly in the upper portion; arkosic conglomerate in the lower part. Abundant inarticulate brachiopods and less numerous specimens of the trilobite *Elrathia sp.* are found within the top 2 to 3 feet of the formation. Thickness 300 to 400 feet (only shown on cross-section, unit does not crop out on map).

UNCONFORMITY

ARCHEAN ROCKS

Agn **GRANITIC GNEISS (ARCHEAN)** Composed of quartz, plagioclase, biotite, and microcline. Intruded with quartz diorite and amphibolite dikes (only shown on cross-section, unit does not crop out on map). This unit is Archean-3,000+ Ma in age.

DISCLAIMERS

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