WYOMING STATE GEOLOGICAL SURVEY
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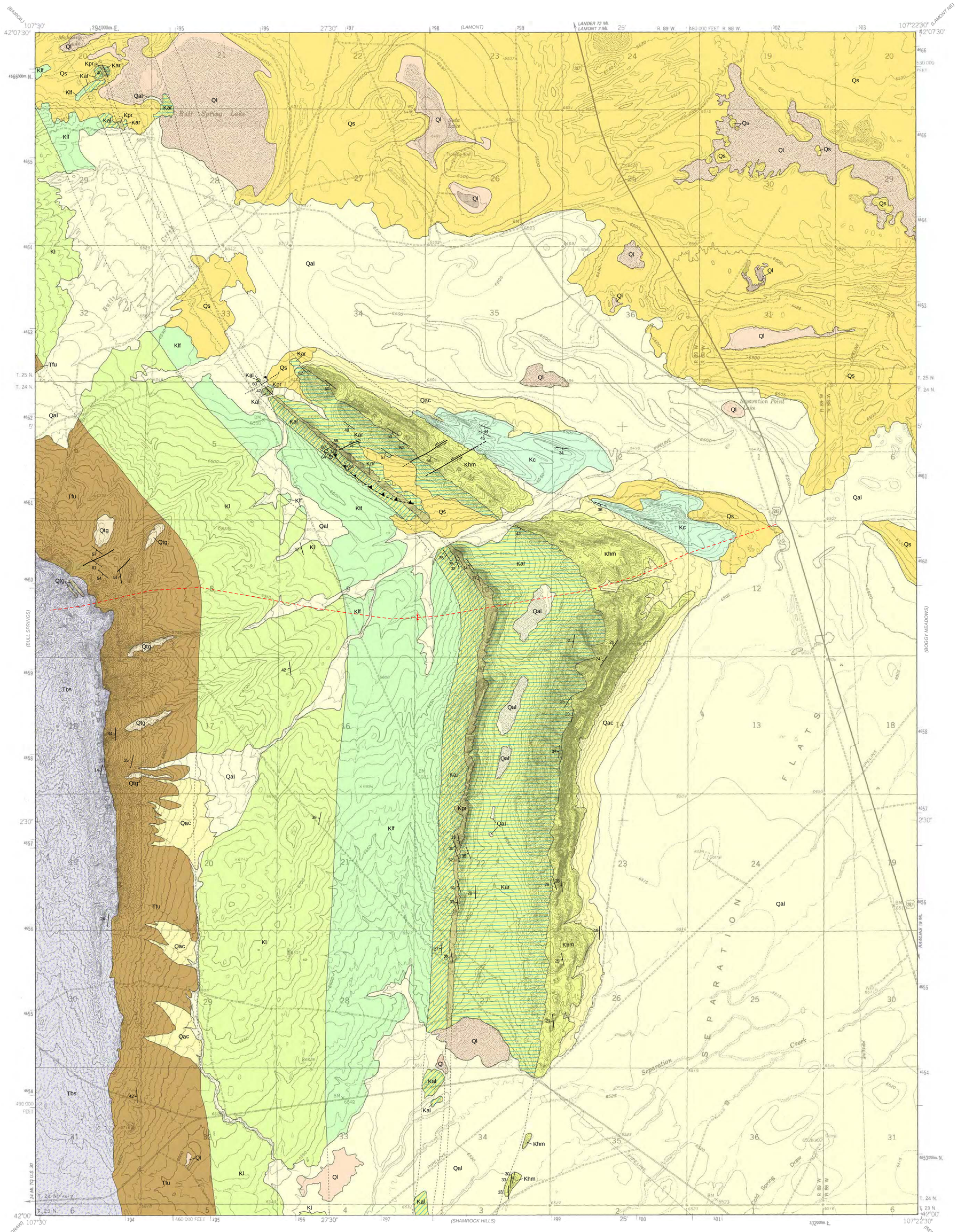
Geology - Interpreting the past - providing for the future

Prepared in cooperation with the U.S. GEOLOGICAL SURVEY

OPEN FILE REPORT 12-2
Separation Rim 1:24,000 - scale Bedrock Geologic Map



EXPLANATION

CORRELATION OF UNITS

Qal, Ql, Qac, Qs, Qtg	Holocene, Pleistocene	QUATERNARY		
Unconformity				
Tbs	Eocene	TERTIARY	CENOZOIC	
Unconformity				
Tfu	Paleocene			
Unconformity				
Kl	Upper Cretaceous	CRETACEOUS	MESOZOIC	
Klf				
Kal (Mesaverde Group)				
Kpr (Mesaverde Group)				
Unconformity				
Kar (Mesaverde Group)				
Khm (Mesaverde Group)				
Kc				

MAP SYMBOLS

Formation contact—Dotted where concealed or projected beneath younger units

Fault—Displacement unknown; dashed where inferred, dotted where concealed

Normal fault—Dotted where concealed, ball and bar on downthrown block

Thrust fault—Dashed where inferred; sawteeth on upper (tectonically higher) plate

Strike-slip fault—Dotted where concealed; arrows indicate relative motion

Syncline—Dashed where inferred

Strike and dip of inclined bedding

Strike and dip of overturned bedding

DESCRIPTION OF MAP UNITS

Quaternary

Qal **Alluvial deposits (Holocene)**—Gravel, sand, silt, and clay, largely unconsolidated and poorly sorted; variable in thickness up to approximately 25 feet (8 m), occurring in stream drainages, flood plains and low-lying terraces

Ql **Lake deposits (Holocene)**—Dry or wet playa lake beds, abundant thin alkaline evaporite minerals at surface, extensive desiccation cracks, sparse vegetation

Qac **Alluvium and Colluvium, undivided (Holocene and Pleistocene)**—Gravel, sand, silt, clay, weathered bedrock, and soil deposited along recent and older flood plains; includes slope wash and smaller alluvial fan deposits that coalesce with alluvium

Qs **Eolian sand, undifferentiated (Holocene and Pleistocene)**—Stable and active wind-blown dunes and dune forms; fine- to medium-grained with silt and scattered coarser material moderately well-sorted

Qtg **Terrace gravels (Holocene and Pleistocene)**—Cobbles, pebbles, sand, and silt of fluvial origin; unconsolidated, poorly sorted; forms broad, sub-horizontal surfaces between drainages

Tertiary

Tbs **Battle Spring Formation (Eocene)**—Light-gray, brown, yellowish-tan medium- to coarse-grained to pebbly arkosic sandstone and conglomerate with local greenish-gray sandy mudstone and claystone; numerous irregular and spheroidal iron-rich concretions; basal boulder beds containing mostly granite boulders averaging 1 to 2 feet (.5 to 1 m) in diameter and local diorite and granite boulders, 3 to 8 feet (1 to 2 m) in diameter respectively; approximately 1,200 feet (366 m) thick

Tfu **Fort Union Formation (Paleocene)**—Complexly interbedded, commonly lenticular or discontinuous sequence of beds. Sandstone, light-colored, argillaceous, fine- to medium-grained; commonly contains ferruginous concretions. Siltstone, light-brown to orange, commonly ferruginous, argillaceous. Shale, light- to dark-gray, locally maroon; locally contains numerous vertebrate, invertebrate, and plant fossils. Local thin coal beds, generally lenticular; thicknesses up to 3 feet (1 m) observed in mapped area. Formation ranges in thickness from 2,200 to 3,000 feet (671 to 914 m)

Cretaceous

Kl **Lance Formation (Upper Cretaceous)**—Interbedded sandstone, siltstone and mudstone. Sandstone is white to grayish-orange to light-brown; very fine to medium-grained, locally coarse; locally silty or lenticular. Siltstone is gray to brownish-gray to rusty brown; platy and locally carbonaceous; locally sandy. Mudstone is light-gray to grayish-black, locally light-olive-green to light-gray; locally carbonaceous. Formation ranges in thickness from 2,700 to 3,000 feet (823 to 914 m)

Klf **Fox Hills Sandstone and Lewis Shale, undivided (Upper Cretaceous)**—These two units occur between the Lance Formation and the underlying Almond Formation and make up a large area in a broad lowland between Coyote Springs Rim and the prominent Pine Ridge hogbacks due west of Separation Rim. Thickness ranges from approximately 1,800 to 2,000 feet (549 to 610 m)

Fox Hills Sandstone (Upper Cretaceous)—Sandstone, pale-gray to pale-orange, very fine to fine-grained, mostly calcareous, well-sorted. Locally interbedded with light-olive-gray, thinly bedded shale

Lewis Shale (Upper Cretaceous)—Marine shale, gray to olive-gray, laminated, silty; locally interbedded with light-gray, fine-grained sandstone; numerous concretions. Base is light- to medium-gray very fine to fine-grained, silty sandstone, grading upward to medium-gray sandy siltstone and medium- to dark-gray silty shale

Mesaverde Group (Upper Cretaceous)—The Mesaverde Group is a sequence of mostly non-marine gray, tan, and brown, fine- to medium-grained, crossbedded sandstone interbedded with shale, carbonaceous shale, and thin lignites; total thickness up to 3,000 feet (914 m). Includes the following four units:

Kal **Almond Formation**—Interbedded shale and sandstone. Shale, gray, carbonaceous, locally silty and/or interbedded with light-gray, very fine grained sandstone. Sandstone, gray to light-gray, very fine grained, ripple beds common, locally salt-and-pepper and silty. Approximately 300 feet (91 m) thick

Kpr **Pine Ridge Sandstone**—Interbedded sandstone and shale. Sandstone, white to gray, commonly weathers rusty orange, salt-and-pepper, very fine- to medium-grained, locally coarse-grained and cherty; commonly crossbedded. Shale, light- to dark-gray, silty to sandy, carbonaceous to lignitic. Approximately 100 to 125 feet (31 to 38 m) thick

Kar **Allen Ridge Formation**—Shale, gray to black, partly silty and carbonaceous; siltstone, light- to dark-gray, partly argillaceous and sandy; sandstone, gray, very fine to fine-grained; local thin coal beds. Ranges in thickness from 1,200 to 1,400 feet (366 to 427 m)

Khm **Haystack Mountains Formation**—Interbedded shale, siltstone, and sandstone. Shale, medium- to dark-gray, soft, partly silty, local carbonaceous, sparsely interlaminated with thin sandstone lenses; local concretions. Siltstone, light- to dark-gray, brownish-gray, partly sandy, locally glauconitic, local fossils consisting of plant material. Sandstone, light- to medium-gray, tan to brown, many beds weather rusty brown, very fine to medium-grained, commonly silty, locally carbonaceous, fossil-bearing, or glauconitic; local bentonite beds. Approximately 1,200 feet (366 m) thick

Kc **Cody Shale (Upper Cretaceous)**—Marine shale, soft, dark-gray to olive-gray, numerous bentonitic shales, sandy; upper part contains thin calcareous siltstone beds and irregular sandy and limey concretions; common marine fossils; lower part is limey, less sandy. Approximately 1,300 feet (396 m) thick

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Base map from U.S. Geological Survey 1:24,000 - scale topographic map of the Separation Rim, Wyoming Quadrangle, 1960, Photorevised 1981

Projection: Universal Transverse Mercator (UTM), zone 13
North American Datum of 1927 (NAD 27)
1,000-meter grid ticks: UTM, zone 13
10,000-foot grid ticks: Wyoming State Plane Coordinate System, east central zone

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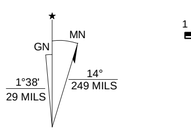


UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

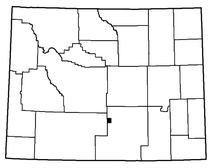
SCALE 1:24,000

1 0.5 0 1 Mile

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 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929



WYOMING QUADRANGLE LOCATION

Digital cartography by Kristen C. Klaphake
Map edited by Suzanne C. Luhr

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PRELIMINARY GEOLOGIC MAP OF THE SEPARATION RIM QUADRANGLE, CARBON COUNTY, WYOMING

by

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2012