UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Geologic Map of the Sagebrush Park Quadrangle, Fremont and Sweetwater Counties, Wyoming

By

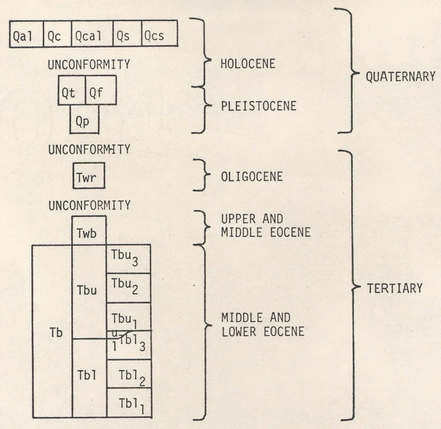
Leonard J. Schmitt, Jr.

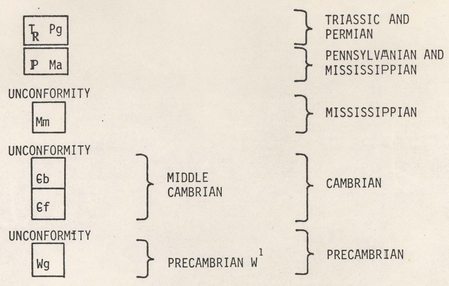
Open-File Report 76-676

1976

This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.

CORRELATION OF MAP UNITS





DESCRIPTION OF MAP UNITS

Qal ALLUVIUM (HOLOCENE)--Unconsolidated gravel, sand, silt and clay deposited in stream channels; locally contains woody vegetal matter. Locally includes some colluvium or windblown sand

Qc COLLUVIUM (HOLOCENE)--Unconsolidated boulders, cobbles, pebbles and sand deposited by gravity and sheet wash downslope from outcrops; grades into alluvium

Qcal COLLUVIUM AND ALLUVIUM (HOLOCENE)--Undifferentiated colluvial and alluvial deposits

Qs WINDBLOWN SAND (HOLOCENE)--Unconsolidated mostly fine to medium-grained eolian sand. Derived primarily from poorly indurated Tertiary sediments. Includes both stabilized and unstabilized dunes

Qcs COLLUVIUM AND WINDBLOWN SAND (HOLOCENE)--Undifferentiated colluvial and eolian deposits

Qt TERRACE DEPOSITS (HOLOCENE AND PLEISTOCENE)--Unconsolidated boulders, cobbles, pebbles, sand, and silt deposited on penehorizontal terrace surfaces

Qf ALLUVIAL FAN DEPOSITS (HOLOCENE AND PLEISTOCENE)--Unconsolidated boulders, cobbles, pebbles, sand, and silt deposited as alluvial fans on very gently sloping surfaces

Qp PEDIMENT DEPOSITS (PLEISTOCENE)--Unconsolidated boulders, cobbles, pebbles, and sand deposited on pediment surfaces. Holocene downcutting has destroyed most pediment deposits except those left capping some interstream ridges

Twr WHITE RIVER FORMATION (OLIGOCENE)--Greenish-gray and pale pinkish-gray tuffaceous siltstone, sandstone and conglomerate. Moderately well to poorly indurated and weakly to moderately calcareous. Siltstone characteristically breaks into conchoidally fractured flaggy slabs. Only an isolated erosional outlier of the formation remains in the southwestern part of the quadrangle. May include some material of Miocene or Pliocene age. Maximum thickness about 100 feet (30 m)

Twb WAGON BED FORMATION (UPPER AND MIDDLE EOCENE)--Only part of the formation is exposed in the southwestern part of the quadrangle. The following description was taken from exposures to the west in the adjoining Crooks Peak quadrangle where the formation is more completely exposed. Upper part is generally well indurated brownish-gray to pinkish-gray silica-cemented conglomeratic arkosic sandstone and conglomerate; weathers into broad hard pink or reddish-brown stained fluted strike ledges. Thickness 75 feet (23 m). Middle part consists of well to moderately indurated light and dark brownish-gray claystone, commonly with pellet structure; gray sandy mudstone; olive-gray bentonitic mudstone; and light-gray flaggy tuffaceous sandy siltstone.

Weathers to very light gray and yellowish-gray puffy-surfaced steep slopes. Thickness 55 feet (17 m). Lower part consists of well indurated, light-gray and yellowish-gray claystone and sandy claystone overlying light yellowish-gray arkosic claystone to grayish-white clayey conglomeratic arkose. Forms conspicuous sequence of ledges or benches. Commonly vuggy and gnarly weatherering; contains abundant burrow structures. Thickness 25-30 feet (8-9 m). Parts of the formation were not mapped separately; upper part probably correlates with the upper part of unit 5 of the Wagon Bed Formation of Van Houten (1964) and lower part probably correlates with unit 1 exposed west of the Conant Creek anticline in the Wind River Basin. Entire sequence is similar to that described by Van Houten (1964) along the Beaver Rim between the Conant Creek anticline and Muskrat Basin on the south side of the Wind River Basin. Love (1970) mapped this sequence as part of the Bridger Formation. Total thickness of unit 155-160 feet (47-49 m)

Tb BATTLE SPRING FORMATION (MIDDLE AND LOWER EOCENE)--Mostly poorly indurated yellowish-gray and grayish-white conglomeratic arkose and conglomerate interbedded with lenticular red and greenish-gray arkosic mudstone or gray carbonaceous mudstone. Divided into upper and lower parts separated by angular unconformity. Generally weathers to white, gray, yellowish-gray, and pale reddish- to orangish-gray elongate low rounded interstream ridges. Only locally well indurated with calcite, limonite, or clay mineral cement; widely scattered iron-oxide concretions and calcite-cemented arkose concretions. Formation named by Pipiringos (1955, 1961) who correlated it with all subdivisions of the Wasatch and Green River Formations in the central part of the Great Divide Basin. Approximate thickness 5,000-5,800 feet (1525-1770 m)

Tbu Upper part of the Battle Spring Formation--The upper part of the Battle Spring Formation (Tbu) is unconformable with the lower part of the formation (Tbl). Stephens (1964) first reported the intraformational unconformity but did not separate upper and lower parts of the formation on his geologic maps. Love (1970) has named most of the upper sequence the Crooks Gap Conglomerate and has tentatively correlated it with the Cathedral Bluffs Tongue of the Wasatch Formation. Where the upper part of the Battle Spring Formation was not separated into individual units (i.e. Tbu_3, Tbu_2, Tbu_1), it includes strata that were mapped elsewhere as the uppermost part of Tbl_3 (see description of Tbl_3). Approximate thickness 1,000-1,500 feet (305-460 m)

Tbu_3 Upper unit of the upper part of the Battle Spring Formation--Light-green, greenish-gray and light yellowish-gray conglomeratic arkose and giant boulder conglomerate (boulders greater than 3 ft or 1 m in diameter); unit caps Green Mountain. Boulders of granite, gneissic granite, quartzo-feldspathic rock (silicified granite?) and diabase. Thickness 100-200 feet (30-60 m)

Tbu_2 Middle unit of the upper part of the Battle Spring Formation--Mostly yellowish-gray, light gray and grayish-white arkose, conglomeratic arkose and conglomerate; forms steep slopes in the upper parts of Green Mountain. Commonly poorly exposed and covered by debris eroded from overlying unit. Appears to be gradational with underlying unit. Approximate thickness 300-600 feet (90-185 m)

Tbu_1 Lower unit of the upper part of the Battle Spring Formation--Yellowish-gray arkose and conglomeratic arkose interbedded with giant boulder conglomerate; commonly stained orange or red-brown in lower part. Forms conspicuous sequence of erosional benches on south side of Green Mountain. Boulders composed of granite, gneissic granite, quartzo-feldspathic rock (silicified granite?), quartzite of the Flathead Sandstone and diabase. Approximate thickness 600-700 feet (185-215 m)

Tbl Lower part of the Battle Spring Formation--Correlates, at least in part, with the main body of the Wasatch Formation. Approximate thickness 4,000-4,300 feet (1,220-1,310 m)

Tbl_3 Upper unit of the lower part of the Battle Spring Formation--The uppermost part of Tbl_3, as mapped, contains 0-400 feet (0-120 m) of strata that probably should be assigned to the upper part of the Battle Spring Formation Tbu). These strata are nearly flat-lying and rest with apparent angular unconformity on the older Tbl_3 sediments. They are composed of fine-grained clastics to conglomerates, locally banded in red and gray colors, and on the south side of Green Mountain are noticeably finer grained than the overlying Tbu_1 sediments. The base of the nearly flat-lying strata could be mapped only locally (u/l contact); therefore, the base of the more readily mappable giant-boulder conglomerate of Tbu_1 was chosen as a mapping horizon.

The older Tbl_3 sediments are mostly gently dipping yellowish-gray arkose and pebble to cobble conglomerate, lenticular purple and gray to greenish-gray arkosic mudstone, and lenticular gray carbonaceous arkosic mudstone. Well exposed in the upper parts of Stratton Hollow in the southeastern part of the quadrangle. Locally contains well indurated outcrops and hoodoos of conglomeratic arkose. Limonite and hematite concretions

common and locally very abundant; locally contains conspicuous oblate spheroidal concretions and ledges or lenses of calcite-cemented arkose. Anomalously radioactive locally and contains economically significant uranium deposits at Crooks Gap in the southern part of the Jeffrey City quadrangle, which joins the northwest corner of the Sagebrush Park quadrangle. Contact with underlying unit gradational or transitional in most places. Approximate total thickness 1,200-1,300 feet (365-395 m)

Tbl_2 Middle unit of the lower part of the Battle Spring Formation--Mostly conspicuously white or grayish-white, locally yellowish-gray, arkose and pebble to boulder conglomerate, and lenticular purple to red and gray to greenish-gray arkosic mudstone; basal part of unit is prominently variegated sequence of lenticular red and green arkosic mudstone interbedded with gray arkose and conglomeratic arkose. Mostly well exposed in the lower parts of Stratton Hollow. Commonly weathers to low, rounded herringbone ridges. Iron oxide concretions and carbonaceous material sparse to absent. Only locally well indurated outcrops of calcite-cemented arkose. May be unconformable with the underlying unit. Approximate thickness 1,200 feet (365 m)

Tbl_1 Lower unit of the lower part of the Battle Spring Formation--Mostly yellowish-gray to yellowish-brown arkose and conglomeratic arkose, and interbedded gray mudstone, arkosic mudstone and carbonaceous mudstone. Resembles upper unit of the lower part of the formation (Tbl_3) but generally contains more fine-grained clastic material. Abundant limonite concretions, calcite-cemented arkose lenses and oblate spheroidal concretions of calcite-cemented arkose. Well exposed near Laundry Draw in the southeastern part of the quadrangle and in the southwestern part of adjoining Whiskey Peak quadrangle. Unit may be an arkosic facies of the Fort Union Formation of Paleocene age. Reynolds (1968, 1971) mapped this unit as part of the Fort Union Formation in the Whiskey Peak quadrangle to the east and in the Bairoil quadrangle to the southeast. Approximate thickness 1,600-1,800 feet (490-550 m)

$T_R P_g$ GOOSE EGG FORMATION (TRIASSIC AND PERMIAN)--Reddish- to orangish-brown sandy siltstone with some dark-gray shale, pinkish-gray dolomite and orange-stained white chert. Exposed only in a small thrust plate resting on the lower part of the Battle Spring Formation in the northeastern corner of the quadrangle

$\mathbb{P}$ Ma AMSDEN FORMATION (PENNSYLVANIAN AND MISSISSIPPIAN)--Reddish-gray to light pinkish-brown shale and siltstone with thin beds of gray limestone. Exposures generally poor; exposed only in a thrust plate resting on the Goose Egg Formation or the lower part of the Battle Spring Formation in the northeastern corner of the quadrangle

Mm MADISON LIMESTONE (MISSISSIPPIAN)--Gray to yellowish-gray highly fractured locally brecciated limestone; bedding generally not evident; locally cherty and sandy. Exposed only in the aforementioned thrust plate

Cb BUCK SPRING FORMATION (MIDDLE CAMBRIAN)--Purplish-brown, reddish-brown, yellowish-brown, and gray to greenish-gray fine-grained silty sandstone and siltstone; laminated and splits platey. Commonly highly glauconitic. Siltstone contains burrow structures. Exposed as steeply dipping to overturned and faulted beds in the previously mentioned thrust

Cf FLATHEAD SANDSTONE (MIDDLE CAMBRIAN)--Reddish-brown, brown to yellowish-brown, and gray to pinkish-gray ~~ortho~~quartzite and conglomeratic ~~ortho~~quartzite; laminated, thin-bedded and crossbedded. Highly brecciated and variably silicified near basal contact with Precambrian granite. Exposed as steeply dipping overturned beds in fault contact with Precambrian granite in the extreme northeastern corner of the quadrangle

Wg GRANITE (PRECAMBRIAN W^1_x)--Gray, pinkish-gray and yellowish-gray mostly coarse grained and locally pegmatitic granite. Highly fractured locally and stained yellowish-brown. Exposed in a rugged mass comprising the Owl Hills. Thrust over or reverse-faulted against the Battle Spring Formation and Flathead Sandstone in the northeastern part of the quadrangle

CONTACT--Approximately located; dotted where concealed. Solid triangle indicates selected locality where contact was well exposed at time of mapping

NORMAL FAULT, SHOWING DIP--Dashed where approximately located; short dashed where inferred; dotted where concealed; queried where probable. U, upthrown side; D, downthrown side. Parallel arrows show direction of relative horizontal movement

THRUST FAULT--Dashed where approximately located; dotted where concealed. Sawteeth on upper plate

STRIKE AND DIP OF BEDS

Inclined

Overturned

APPARENT DIP DIRECTION OF BEDS--Dot marks point of observation

PROSPECT PIT--Validation pit or trench for uranium claims

ADIT--Approximately horizontal passage to explore for or mine uranium

Oil & Gas Futures, Inc, 450'Tb, 460'T.D.

DRY HOLE--Oil test; shows operator and lease names, thickness of the Battle Spring Formation penetrated in the hole and total depth

Shell Oil Co. Timber Mountain 1 2813'T.D.

CORE HOLE--Shows operator, lease names, and total depth

ALTERATION BOUNDARY--Approximate lowest stratigraphic limit of red supergene oxidative alteration (probably hematite); dotted where concealed. Letter r on side of boundary with indicated alteration

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[1]An interim scheme for subdivision of Precambrian time recently adopted by the U.S. Geological Survey:
Precambrian Z - base of Cambrian to 800 m.y.
Precambrian Y - 800 m.y. to 1,600 m.y.
Precambrian X - 1,600 m.y. to 2,500 m.y.
Precambrian W - older than 2,500 m.y.

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~~Wyoming (Sagebrush Park quad.). Dist. 1:24,000.~~
~~Sheet 2~~
~~Copy 1~~