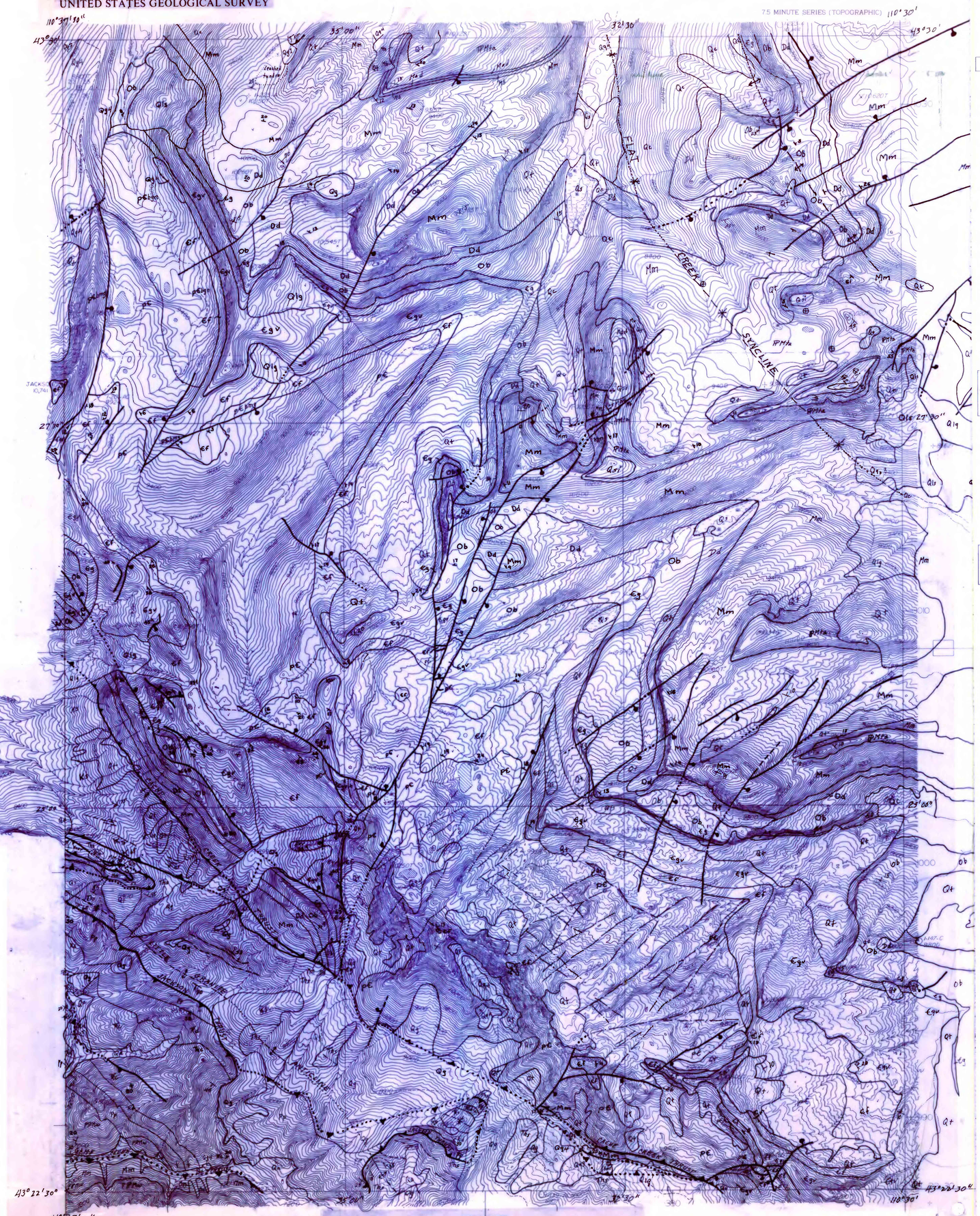
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
78-481
TURQUOISE LAKE QUAD., WYO.



Base from U.S. Geological Survey unedited advance print

SCALE 1:24 000
1 ½ 0 1 MILE
1 .5 0 1 KILOMETER
CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

Geology by C. M. Love, 1967; 1969; J. D. Love, 1955-56, 1958, 1975; F. S. Simons, 1975; W. R. Keefer, 1975, and D. S. Harwood, 1975

GEOLOGIC MAP OF THE TURQUOISE LAKE QUADRANGLE, TETON COUNTY, WYOMING

By
Charles M. Love and J. D. Love

1978

CORRELATION OF MAP UNITS

Qa	Holocene			QUATERNARY
Qc	Holocene			QUATERNARY
Qs	Holocene			QUATERNARY
Qt	Holocene			QUATERNARY
Qls	Holocene			QUATERNARY
UNCONFORMITY				
Qg[4]	Pleistocene	Qlg		QUATERNARY
UNCONFORMITY				
Qg[3]	Pleistocene	Qlg		QUATERNARY
UNCONFORMITY				
Qg[2]	Pleistocene	Qlg		QUATERNARY
UNCONFORMITY				
Qg[1]	Pleistocene	Qlg		QUATERNARY
UNCONFORMITY				
Qsi	Pleistocene	Qlg		QUATERNARY
UNCONFORMITY				
Tsm	Miocene			TERTIARY
UNCONFORMITY				
Ths	Eocene or Paleocene			TERTIARY
UNCONFORMITY				
Ks	Upper Cretaceous			CRETACEOUS
Kmr	Lower Cretaceous			CRETACEOUS
Kcvt	Lower Cretaceous			CRETACEOUS
Ꞧc	Lower Triassic			TRIASSIC
Ꞧd	Lower Triassic			TRIASSIC
Pp				PERMIAN
UNCONFORMITY				
IPMw				PENNSYLVANIAN
IPMta				PENNSYLVANIAN
Mad	Upper Mississippian			MISSISSIPPIAN
Mb	Upper Mississippian			MISSISSIPPIAN
Mm	Lower Mississippian			MISSISSIPPIAN
Dd	Upper and Middle Devonian			DEVONIAN
UNCONFORMITY				
Ob	Upper Ordovician			ORDOVICIAN
UNCONFORMITY				
Ꞓg	Upper Cambrian			CAMBRIAN
Ꞓgv	Middle Cambrian			CAMBRIAN
Ꞓf	Middle Cambrian			CAMBRIAN
UNCONFORMITY				
pCbmg				PRECAMBRIAN
pCbgn				PRECAMBRIAN
pC				PRECAMBRIAN

DESCRIPTION OF MAP UNITS

HOLOCENE SURFICIAL DEPOSITS

Qa Alluvium--Valley and stream deposits of gravel with lesser amounts of sand, silt, and clay

Qc Colluvium--Slopewash of silt- to boulder-sized fragments derived from underlying and adjacent units

Qs Swamp deposits--Clay, silt, and fine sand, dark gray and brown; rich in vegetal debris

HOLOCENE AND PLEISTOCENE SURFICIAL DEPOSITS

Qt Talus deposits (including rock glaciers)--Locally derived coarse, angular rock fragments that accumulated on steep slopes and at the base of cliffs; merge in places with the youngest glacial moraines

Qls Landslide debris--Chaotically mixed boulders and finer rock debris emplaced by mass movement

Qlg Landslide and glacial debris intermixed

PLEISTOCENE DEPOSITS

Qg^4 Glacial debris of fourth (and youngest) major glaciation in this area--Morainal debris with sharp rough unmodified surface topography, little weathering of rock fragments, and sparse soil development

Qg^3 Glacial debris of third major glaciation in this area --Morainal debris with subdued surface topography; moderately weathered rock fragments; capped by loess and soil in many places

Qg^2 Glacial debris of second major glaciation in this area --Very old formless piles and lag deposits of large and small erratics, in places mixed with outwash gravel, sand, and silt; most erratics are not locally derived and the softer ones are deeply weathered; extensive soil development in some places

Qg^1 Glacial debris of first (oldest) major glaciation in this area--Tightly cemented (with gray lime cement) as well as unlithified formless unstratified gray deposits of unsized and unsorted rounded to angular fragments of Mesozoic, Paleozoic, and sparse Precambrian granitic rocks; most are not locally derived and some came long distances at a time when present drainage systems either were nonexistent or were buried by ice

Qg Glacial debris undivided

Qsi STRATA LIKE THOSE AT THE SHOOTING IRON RANCH (PLEISTOCENE)--These strata are informally called the formation at the Shooting Iron Ranch (Love and Albee, 1972). They are in part of lacustrine origin and unconformably overlap older rocks. The thickest section consists of 22 m (72 ft) of alternating locally derived nonvolcanic conglomerate, very soft volcanic sandstone, and pink, gray, green, and yellow bentonitic claystone

Tsm SLUMP MASS (MIOCENE)--Brecciated and recemented slump mass of Mississippian Madison Limestone extending northward across the quadrangle boundary where it is incorporated in the Miocene Teewinot Formation

HOBACK FORMATION

Ths Skyline Trail Conglomerate Member of Dorr, Spearing, and Steidtmann, 1977 (Lowest Eocene or Paleocene)--Tightly cemented red conglomerate of angular to subrounded clasts of Paleozoic and Mesozoic rocks derived from the Gros Ventre Range. Basal exposed part has more gray than red and the lowest conglomerate contains broken and subrounded Precambrian clasts as much as 36 cm (1 ft) in diameter similar to those in the Paleocene and Upper Cretaceous Pinyon Conglomerate, apparently reworked from quartzite conglomerates in the Upper Cretaceous Harebell Formation to the north before the Gros Ventre Range rose enough to be a complete barrier to southward-flowing streams. Only a partial section of about 900 m (2,950 ft) is present, with top and bottom cut off by faults

Ks LENTICULAR SANDSTONE AND SHALE SEQUENCE AND COALY SEQUENCE (UPPER CRETACEOUS)--Gray and tan lenticular fine-grained sandstone, gray shale and shaly sandstone, carbonaceous shale, marlstone, and some beds of coal of minable thickness, chiefly in middle. Upper part cut off by faults. Thickness at least 1,525 m (5,000 ft)

Kmr MOWRY SHALE (LOWER CRETACEOUS)--Dark-gray to black siliceous shale, dense hard silicified speckled sandstone, and thin bentonites; many shales weather silvery gray and are characterized by abundant fish scales. Thickness uncertain because top and bottom are cut off by faults. Normal section is probably 150 to 215 m (500-700 ft) thick

Kcvt CLOVERLY FORMATION (LOWER CRETACEOUS)--Only the "rusty beds member" is present; it is exposed in a fault slice. It consists of olive-green, gray, and buff thin-bedded sandstones that weather with a conspicuous rusty color. The remnant is probably about 30 m (100 ft) thick

Ꞧc CHUGWATER FORMATION (TRIASSIC)--Only a partial section about 300 m (1,000 ft) thick is present. It consists of red gypsiferous siltstone and very fine grained red silty sandstone containing some red shale partings. A few beds of gray silty limestone and gray quartzitic sandstone are present

Ꞧd DINWOODY FORMATION (LOWER TRIASSIC)--Siltstone, brownish gray to olive drab, hard, slabby, thin bedded, dolomitic; contains thin partings of fine-grained dolomitic sandstone and silty limestone. Thickness 61-140 m (200-450 ft)

Pp PHOSPHORIA FORMATION (PERMIAN)--Dolomite, chert, phosphorite, and black shale. Dolomite and chert are dark gray to brown, sandy, chiefly in upper part; phosphorite and black shale at top and in lower part. Thickness 55-72 m (180-235 ft)

IPMw WELLS FORMATION AND ASSOCIATED ROCKS UNDIVIDED (PERMIAN, PENNSYLVANIAN, AND MISSISSIPPIAN)--The upper part of the Wells Formation is light-gray hard fine-grained sandstone, with chalky white brittle very fine grained dolomite and gray chert at very top. Gray limestones are more abundant in middle of lower parts of the sequence and are interbedded with red and green shale and tan to white sandstone. Carnelian red and mustard yellow chert nodules and lenses are conspicuous. Thickness about 280 m (920 ft)

IPMta TENSLEEP AND AMSDEN FORMATIONS, UNDIVIDED (PENNSYLVANIAN AND MISSISSIPPIAN)--The upper part is the Tensleep Sandstone, light gray, weathering yellowish brown, fine grained, hard, brittle, quartzitic in part. Gray hard limestone and dolomite are more abundant in the middle and lower parts. The Amsden Formation consists of brick-red, brown, and green shale and siltstone interbedded with white dolomite and limestone. Several zones contain ocher-colored and carnelian-red chert nodules. Thickness about 275 m (900 ft), exclusive of Darwin Sandstone Member (Mad)

Mad Darwin Sandstone Member (Upper Mississippian)--Gray to brownish-pink fine- to medium-grained sandstone containing some large rounded frosted quartz grains; crossbedded, moderately soft and porous; red shale partings near top. Mapped separately only in the northern part of the quadrangle. Thickness 23-30 m (75-100 ft)

MADISON LIMESTONE

Mb Bull Ridge Member (Upper Mississippian)--Shale and siltstone, red, interbedded with orange-red to tan sandstone, tan to pink dolomite breccia, and blue-gray ledge-forming limestone containing highly distinctive red and "zebra-striped" gray and black chert nodules. Not mapped separately on cliff faces or in areas of intense deformation. Thickness 15-30 m (50-100 ft)

Mm Main part (Upper and Lower Mississippian)--Limestone, light- to dark-gray, thick-bedded to massive in upper part, thin-bedded and dolomitic in lower part; vuggy brown dolomite near base; many layers and lenses of black chert. Thickness is about 335-460 m (1,100-1,500 ft), with thickest section in the southwest corner of the quadrangle

Dd DARBY FORMATION (UPPER AND MIDDLE DEVONIAN)--Upper part is dolomitic siltstone and shale, dull-yellow, thin-bedded; lower part is brown fetid vuggy siliceous brittle dolomite containing sparse thin limestone beds. Thickness is about 100 m (300 ft)

Ob BIGHORN DOLOMITE (UPPER ORDOVICIAN)--Dolomite, mottled light and dark gray, siliceous, cliff forming. Leigh Dolomite Member at top of cliffs (not mapped separately), about 15 m (50 ft) thick, forms slope and consists of chalky-white very fine grained brittle dolomite. Thickness is about 61 m (200 ft)

-Ꞓg GALLATIN LIMESTONE (UPPER CAMBRIAN)--Limestone, bluish gray, mottled, with irregular granular yellow patches; irregularly bedded, hard; forms ragged cliffs. Thickness 55-73 m (180-240 ft)

-Ꞓgv GROS VENTRE FORMATION (UPPER AND MIDDLE CAMBRIAN)--Sequence consists of three members, from youngest to oldest, the Park Shale, Death Canyon Limestone and Wolsey Shale. The Park (Upper and Middle Cambrian) consists of 45-105 m (150-350 ft) of green to gray highly fissile micaceous shale with numerous algal heads at base. The Death Canyon (Middle Cambrian) is a conspicuous cliff-former of hard blue-gray to dark-gray fine-grained thin-bedded limestone, mottled with brown and tan irregular limestone blotches. At the base is a distinctive bed of brown-weathering dolomite. The thickness is 90-115 m (300-370 ft). The Wolsey (Middle Cambrian) is a green to gray-green highly fissile micaceous shale about 30 m (100 ft) thick

-Ꞓf FLATHEAD SANDSTONE (MIDDLE CAMBRIAN)--Sandstone, white, tan, brown, and maroon, crossbedded, locally conglomeratic near base; locally quartzitic. Thin partings of green micaceous shale are in upper part and contact with overlying Wolsey Shale Member is transitional. Thickness 60-90 m (200-300 ft)

pC PRECAMBRIAN ROCKS UNDIVIDED--All rocks are gneisses or granites except for dikes and shear zones

pCbmg BIOTITE-MUSCOVITE GRANITE (PRECAMBRIAN)--Gray medium-grained equigranular to porphyritic rock composed of quartz, plagioclase, microcline, biotite, and muscovite

pCbgn BIOTITE GNEISS (PRECAMBRIAN)--Layered rock composed of plagioclase, bluish-white quartz, and biotite. Some layers contain muscovite and andalusite

CONTACT

NORMAL FAULT--Dotted where concealed or inferred. Bar and ball on downthrown side

THRUST OR REVERSE FAULT--Dotted where concealed or inferred. Sawteeth are on upper plate

ANTICLINE--Showing crestline. Dotted where concealed or inferred

SYNCLINE--Showing troughline. Dotted where concealed or inferred

LINEAR--Line on aerial photographs, generally marking fault or fracture

STRIKE AND DIP OF BEDS

15 Inclined--Where no figure is given, amount is indeterminate

Vertical

75 Overturned

Horizontal

Generalized direction of dip without strike

OTHER FEATURES

Mappable bed

REFERENCES

Dorr, J. A., Jr., Spearing, D. R., and Steidtmann, J. R., 1977, Deformation and deposition between a foreland uplift and an impinging thrust belt; Hoback Basin, Wyoming: Geol. Soc. America Special Paper 177, 82 p.

Love, J. D., and Albee, H. F., 1972, Geologic map of the Jackson quadrangle, Teton County, Wyoming: U.S. Geol. Survey Map I-769-A.