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U.S. GEOLOGICAL SURVEY
JUL 14 1953
GEOLOGIC DIVISION

TRACE ELEMENTS REPORT 1062
MEMORANDUM

1957 OCT 20 AM 8 50
T. G. ...
on 10/22

EXPLANATION

Gal

Alluvium

Water-deposited gravel and finer material in stream valleys; alluvial fans, generally composed of boulders and finer material.

Qcal

Windblown sand

Light-brown to light-gray fine-grained sand, generally occurs as small dunes and thin sheets on relatively flat areas underlain by the Navajo sandstone or the Kayenta formation. In part reworked by water.

Qp

Deposits veneering pediment

Rounded volcanic boulders in a matrix of finer sediment; locally underlain by orange pebbly sand. Deposits form gently sloping surfaces.

Qb

Bouldery deposits

Coarse, very poorly sorted debris, generally composed of rounded basalt boulders and finer material derived from both lava beds and sediments. Deposits are limited to the northwest part of the area; in part may be moraine and outwash; much of the material has been reworked by water.

Q11 Q12

Landslide deposits

Landslide debris and talus creep deposits, Q11, generally consists of boulders of the Wingate sandstone mixed with claystone from the Chinle formation. Most features mapped include scattered blocks of sandstone at the base of cliffs. Slump blocks, Q12, large blocks, primarily of Wingate sandstone, that have slumped and moved downward en masse.

Qt

Talus

Cones of rock rubble at the base of cliffs of Wingate sandstone.

Jc

Carsel formation

Thick-bedded sandstone, thin-bedded red calcareous siltstone, and gray silty limestone. Sandstone, probably reworked Navajo sandstone, is most prevalent in the lowest 100 feet of the formation. Red siltstone and limestone comprise the bulk of the remaining 175 to 200 feet exposed in the quadrangle. Top not exposed. Crops out as steep slopes broken by a series of ledges.

Jn

Navajo sandstone

White to gray to pink sandstone, crossbedded on a large scale. Contains local thin beds of gray sandy limestone that generally show desiccation cracks. Beds in lower 50 to 75 feet of the formation are generally planar bedded and have pink to orange cast. About 1,100 feet thick in this area. Crops out as rounded knobs and on bare slopes.

Jk

Kayenta formation

Red and purplish-red thin- to thick-bedded sandstone, and a few interbeds of shale, limestone, and conglomerate; as much as 30 feet of reworked Wingate sandstone at base; 20 to 40 feet of white to pink sandstone showing large-scale crossbedding occurs 25 to 50 feet below top; contact with overlying Navajo sandstone is placed at top of uppermost red silty bed; 350 to 360 feet thick; crops out on slopes broken by a series of ledges.

Rw

Wingate sandstone

Massive, orange-red to reddish-brown, fine-grained well-sorted sandstone, crossbedded on large scale; local thin sandy calcareous beds in lower half of unit; coarser sand grains (berries) occur along bedding planes locally. Lower part of unit is white and yellowish-gray in the eastern part of the quadrangle. The upper surface of the formation is characterized by gentle swales and hills which have up to 50 feet of relief locally. The contact with underlying Chinle formation is generally sharp, and is marked by a thin zone of poorly sorted sand and local scour and fill features. Crops out as vertical cliffs. Wingate is 300 to 350 feet thick.

Rcu Rcs

Chinle formation

Chinle undifferentiated, Rcu, includes three unmapped members: 1) Owl Rock member, composed of structureless, nonbentonitic mudstones and green and gray silty limestone; 2) Petrified Forest member, variegated bentonitic mudstone; sandstone near top contains fossil trees replaced by silica; 3) Monitor Butte member, green and gray bentonitic mudstone, limestone-pebble conglomerate lentils, and ripple-laminated gray to dark-gray micaceous sandstone. Shinarump member, Rcs, light-gray to light-yellow medium- to fine-grained crossbedded sandstone with minor conglomerate beds. Base not exposed. Outcrops marked Rcs(?) may be sandstone lenses in the lower part of the Monitor Butte member. The Shinarump member is a host rock for uranium minerals in the Circle Cliffs area. The Chinle formation including the Shinarump member is about 575 feet thick.

Contact

(Dashed where approximately located; short dashes where inferred, indefinite, or gradational; dotted where concealed)

Fault

(Dashed where approximately located; dotted where concealed; U, upthrown side; D, downthrown side)

Probable fault

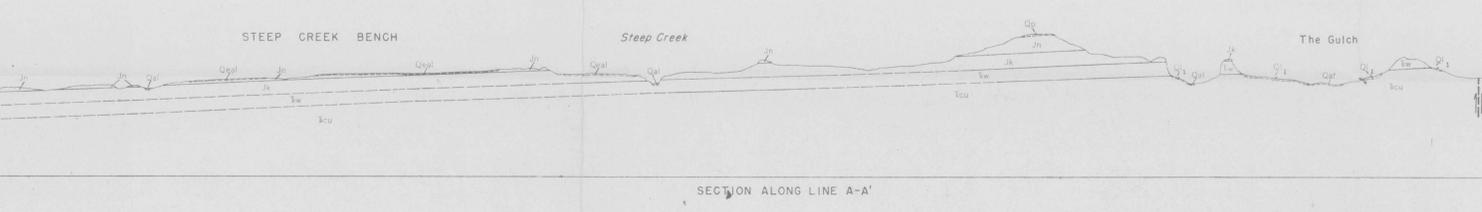
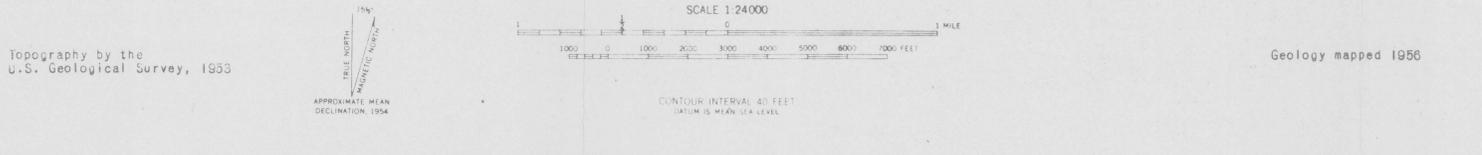
(U, upthrown side; D, downthrown side)

Strike and dip of beds

Structure contours

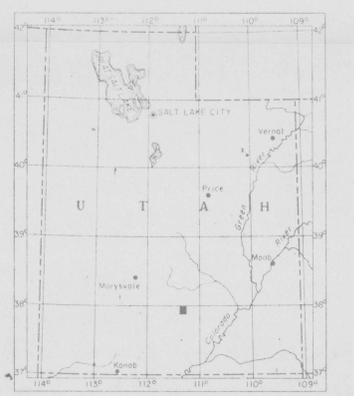
Drawn on base of Wingate sandstone. Dashed where approximately located; short dashes where projected above surface; and queried where control is poor. Contours absent in areas of no control. Contour interval 100 feet. Datum is mean sea level.

(Note: U. S. Geological Survey MF series geologic maps of the adjacent Circle Cliffs quadrangles have structure contours drawn on the base of the Kaibab Formation of Permian age. Contours on this map may be approximately adjusted to this horizon by subtracting 1,200 feet.)



PRELIMINARY GEOLOGIC MAP OF THE CIRCLE CLIFFS 2NE QUADRANGLE, GARFIELD COUNTY, UTAH

by
GLEN A. MILLER AND ROBERT A. CADIGAN



INDEX MAP OF UTAH SHOWING AREA OF THIS REPORT