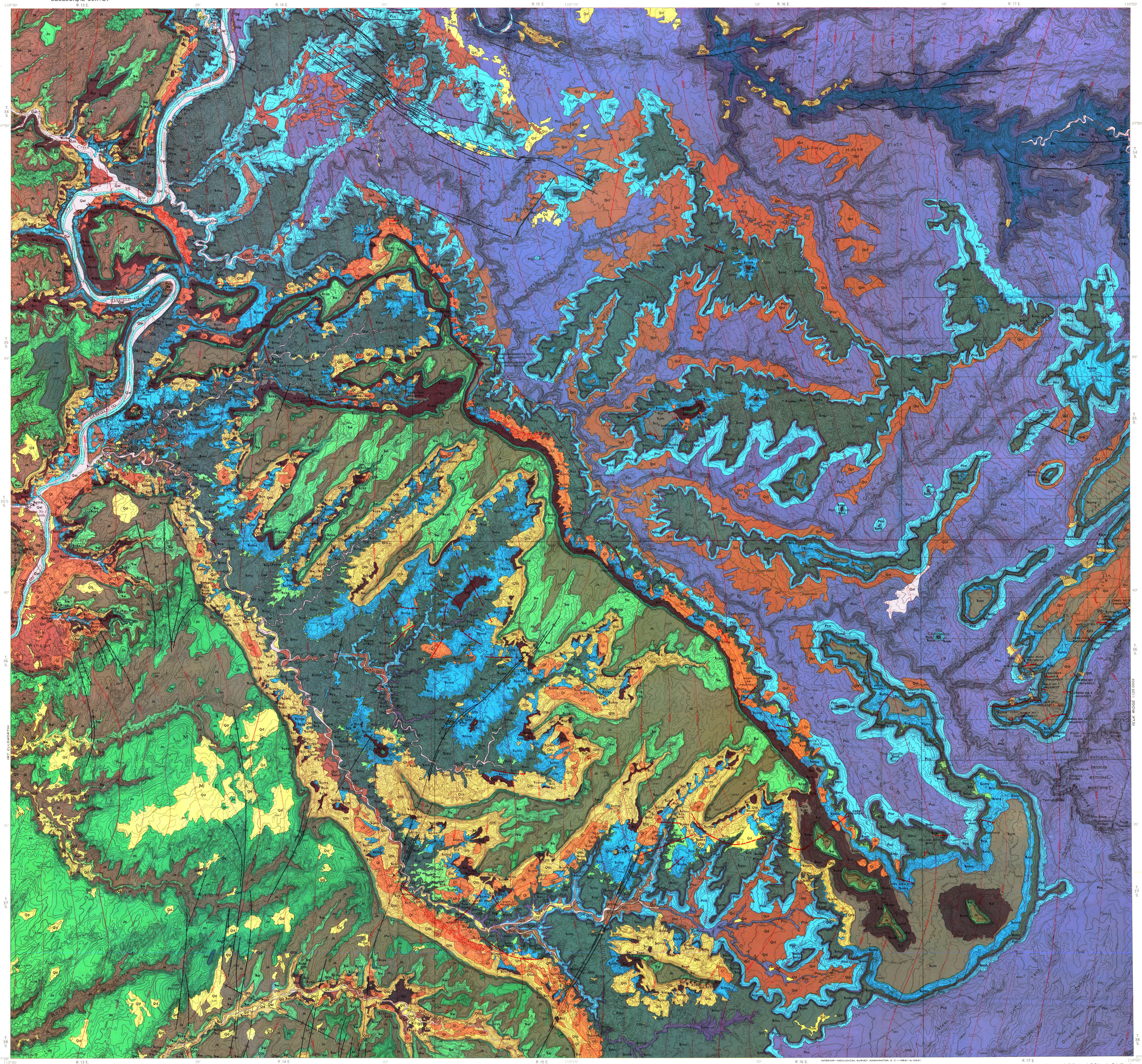



Base from U. S. Geological Survey topographic quadrangles, scale 1:62 500

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1964—G 10641

Geology by R. E. Thaden, A. F. Trites, Jr., T. L. Finnell, W. E. Benson, E. P. Beroni, H. A. Hubbard, C. F. Lough, J. C. Feeger, R. B. Morrison, L. C. Huff, J. D. Sears, and T. G. Fails, assisted by E. J. Ostling, G. A. Hadd, J. C. Simson, and G. E. Wales, 1951–54

# GEOLOGIC MAP OF THE WHITE CANYON AREA, SAN JUAN AND GARFIELD COUNTIES, UTAH

APPROXIMATE MEAN DECLINATION, 1964

SCALE 1:48 000

1 ½ 0 1 2 3 4 5 MILES

1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

## EXPLANATION

**QUATERNARY**

**Qt** — Tufa
*Limy cellular deposits derived from springs. Cements talus breccia, colluvium, and other surficial deposits. Adheres to canyon walls and caps small mesas*

**Ql** — Landslides
*Integral blocks of rock as much as 1.5 miles long that have slid to lower topographic and stratigraphic levels. Most blocks have rotated so as to dip toward the nearby cliff. Confined largely to rocks of the Kayenta, Wingate, and Chinle formations*

**Qld** — Lacustrine deposits
*Thinly laminated poorly consolidated silt and very fine sand*

**Qal** — Alluvium
*Stream-deposited silt, sand, and gravel*

**Qg** — Gravel
*Stream-deposited pebbles, cobbles, and boulders, composed largely of igneous material, on cut terraces along present and former courses of the Colorado River. Deposits are as much as 300 feet above the present river level*

**Qtb** — Talus breccia
*Gravity-deposited sand to boulder-size rock fragments that form veneers on steep slopes. Original bedding has been destroyed except in individual fragments. Locally well consolidated*

**Qcl** — Colluvium
*Fine to coarse debris, transported partly by gravity. Includes much slope wash and fan material. Mantles pediment surfaces and the lower slopes below cliffs*

**Qd** — Dune sand
*Windblown sand deposits derived from the weathering of sedimentary rocks*

**JURASSIC**

*Middle and Upper Jurassic*

**Jsr** — San Rafael group, undifferentiated
*Upper part is basal part of Entrada sandstone; thin to thick cross-stratified white to reddish-brown silty sandstone. Beds are lenticular. Maximum of 83 feet exposed. Lower part is Carmel formation; thin-bedded fine-grained reddish-brown and grayish-orange sandstone interstratified with reddish-brown siltstone. Forms flats and gentle ledgy slopes; about 107 feet thick*

*Glen Canyon group*

**Jn** — Navajo sandstone
*Cross-stratified yellowish-gray to reddish-orange very fine grained to fine-grained sandstone. Horizontally stratified at top and bottom. Few thin lenses of sandy limestone. Forms massive cliff; top surface weathers to rounded knobs; 631 feet thick*

**Jk** — Kayenta formation
*Lenticular even-bedded to cross-stratified fine- to medium-grained pale-red to purplish-red sandstone. Few thin conglomeratic lenses and seams of claystone and siltstone. Weathers to alternating cliffs and steep slopes; 185 to about 300 feet thick*

**JURASSIC(?)**

**Jw** — Wingate sandstone
*Cross-stratified reddish-brown fine-grained sandstone with lenses of silty sandstone. Forms vertical cliff; 280 to 320 feet thick*

**TRIASSIC**

*Upper Triassic*

**Ꞧcss, Ꞧcl, Ꞧcm, Ꞧcms, Ꞧcs** — Chinle formation
*Ꞧcss, siltstone-sandstone unit, irregularly laminated pale-reddish-brown siltstone with interstratified fluvial cross-stratified fine- to coarse-grained sandstone. In the southwestern part of the area, the unit is capped by a 30- to 50-foot-thick bed of coarse conglomeratic and arkosic purplish-red sandstone—the Hite bed of Stewart and others (1959). Weathers to alternating steep slopes and cliffs; 83 to 204 feet thick*
*Ꞧcl, limy unit, upper part dominantly pale-red and pale-green claystone and limestone. Contains some limestone breccia. Lower part dominantly variegated bentonitic claystone. Contains some siltstone and sandstone beds. Weathers to a steep slope; 279 to 523 feet thick*
*Ꞧcm, Moss Back member, lenticular cross-stratified gray to pale-orange fine- to medium-grained sandstone and thin lenses and beds of siltstone and conglomerate. Forms cliff; from 0 to 190 feet thick; averages about 50 feet thick*
*Ꞧcms, mudstone-sandstone unit, variegated mudstone with many lenticular cross-stratified gray, red, and yellowish-gray sandstone and conglomeratic sandstone beds. Forms steep slope with small cliffs; 180 to 250 feet thick*
*Ꞧcs, Shinarump member, lenticular cross-stratified gray to yellowish-gray fine-grained to conglomeratic sandstone. Has lenses and beds of mudstone. Locally contains uranium and copper deposits where it fills channels cut in the top of the Moenkopi formation. Forms cliff; 0 to 80 feet thick; averages about 30 feet thick*

*UNCONFORMITY*

*Triassic(?) and Lower and Middle(?) Triassic*

**Ꞧmu, Ꞧmh** — Moenkopi formation
*Ꞧmu, upper member, lower and upper units are dominantly reddish-brown siltstone and sandstone. Middle unit is series of lenticular pale-orange very fine grained sandstone beds interstratified with reddish-brown siltstone and calcareous sandstone. Contains few thin limestone beds. Weathers to cliffs and ledge slopes; 175 to about 285 feet thick*
*Ꞧmh, Hoskinnini member, pale- to moderate-reddish-brown very fine grained to coarse-grained sandstone interbedded with grayish-orange sandstone. Forms a knobby cliff; 0 to about 110 feet thick*

*UNCONFORMITY*

**PERMIAN**

**Pcw, Pco, Pcc** — Cutler formation
*Pcw, White Rim sandstone member, cross-stratified yellowish-orange very fine grained silty sandstone. Forms a cliff; 0 to about 30 feet thick*
*Pco, Organ Rock tongue, horizontally stratified reddish-brown and grayish-red siltstone beds alternating with sandstone beds. In the northern part of the area a middle unit consists of a series of reddish-brown siltstone beds interbedded with, and grading laterally into, trough cross-stratified light-brownish-pink medium-grained sandstone beds. Forms steep ledgy slopes and cliffs; 210 to 350 feet thick*
*Pcc, Cedar Mesa sandstone member, cross-stratified light-grayish-orange fine-grained sandstone interbedded with lenses of red, gray, green, and brown sandy siltstone near the top. Weathers to vertical cliffs; about 980 feet thick*

**PENNSYLVANIAN AND PERMIAN(?)**

**PPr** — Rico formation
*Thin- to thick-bedded lenticular pale-pinkish-orange to pale-yellowish-gray fine- to coarse-grained sandstone. Forms a slope; about 375 to 460 feet thick*

**CARBONIFEROUS**

**IPh** — Hermosa formation
*Upper part of formation is thick-bedded dark-gray to brown limestone interstratified with thin beds of sandstone and limy sandstone. Weathers to cliffs separated by short slopes; maximum of about 600 feet thick exposed*

Contact
*Dashed where approximately located; dotted where concealed*

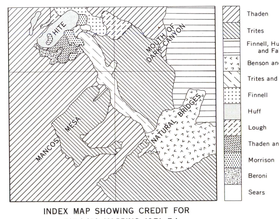
Fault, showing dip
*Dashed where approximately located; dotted where concealed; U, upthrown side; D, downthrown side; number shows displacement in feet*

Channel filled with sediments of the Shinarump member of the Chinle formation
*Dashed where inferred. Geologic data given in text table on "Data on channels"*

Structure contour
*Drawn on the top of the Wingate sandstone and Hoskinnini member. Dashed where approximately located. Contour interval 100 feet*

Prospect

Mine




INDEX MAP SHOWING CREDIT FOR GEOLOGIC MAPPING, 1951–54