DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

GEOLOGIC QUADRANGLE MAP
KANAB QUADRANGLE, UTAH-ARIZONA
GQ-1603

Base from U.S. Geological Survey, 1957
Modified 1983
10,000-foot grid based on Utah coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue
Color generated by computer

TRUE NORTH
MAGNETIC NORTH
13½°
APPROXIMATE MEAN DECLINATION, 1985

SCALE 1:62 500
1 ½ 0 1 2 3 4 MILES
1 .5 0 1 2 3 4 KILOMETERS
CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

UTAH
QUADRANGLE LOCATION

Geology mapped 1978-83

CORRELATION OF MAP UNITS

Qay, Qe	Holocene	QUATERNARY
Qa, Qes, Qae		
Qp, Qt, Qb	Pleistocene	
Qlc		
Qg		
Tgr	Pliocene(?)	TERTIARY
Unconformity		
Ktd	Upper Cretaceous	CRETACEOUS
Unconformity		
Jcw, Jcg, Jcb, Jcl	Middle Jurassic	JURASSIC
Unconformity		
Jtc		
Unconformity		
J Ꞧnm		JURASSIC
Ꞧkt, Ꞧnl, Ꞧkm, Ꞧmo	Upper Triassic(?)	TRIASSIC(?)
Unconformity		
Ꞧc: Ꞧcp, Ꞧcs	Upper Triassic	TRIASSIC
Unconformity		
Ꞧmp	Middle(?) and Lower Triassic	

DESCRIPTION OF MAP UNITS

Qay YOUNGER ALLUVIUM (HOLOCENE)—Most recent unconsolidated deposits of clay, sand, gravel, and silt forming flood plains and filling channel of Kanab Creek in eastern part of quadrangle

Qe EOLIAN SAND (HOLOCENE)—Light-gray, yellowish-gray, and reddish-orange, fine- to medium grained, windblown sand composed mostly of quartz in currently active sand dunes. Navajo Sandstone is major source of unit

Qa ALLUVIUM (HOLOCENE)—Unconsolidated deposits of clay, sand, gravel, and silt as channel, flood-plain, lacustrine, and, locally, alluvial-fan deposits

Qes STABILIZED EOLIAN SAND (HOLOCENE)—Inactive windblown sand largely stabilized by vegetation but retaining dune forms

Qae ALLUVIUM AND EOLIAN SAND, UNDIVIDED (HOLOCENE)

Qp PEDIMENT ALLUVIUM (PLEISTOCENE)—Unconsolidated clay, silt, sand, and gravel forming mantle over eroded sloping bedrock. Includes poorly sorted alluvial-fan debris, slope wash, and minor talus. Generally slightly higher than adjacent alluvial surfaces. Deposits merge at their lower end with alluvium

Qt TRAVERTINE DEPOSIT (PLEISTOCENE)—Dense, finely crystalline, tan limestone formed by precipitation from hot springs. Weathers light gray. Upper part of deposit contains abundant subangular to subrounded, yellowish-brown sandstone clasts 6-8 in. (15-20 cm) in diameter and of probable Cretaceous age. Map unit is in northwestern part of quadrangle, just east of East Fork of Virgin River. Deposit forms mound about 30 ft (10 m) high that has been dissected by stream

Qb OLIVINE BASALT LAVA FLOWS (PLEISTOCENE)—Dense to vesicular, dark-gray olivine basalt in lava flows confined to paleo-stream channels. Locally consists of two flows, each 10-50 ft (3-15 m) thick, an underlying basaltic-flow breccia 1-2 ft (0.3-0.6 m) thick and a basal gravel as much as 3 ft (1 m) thick. Luedke and Smith (1978) suggest basalt is between 0.01 and 5.0 m.y. old. Map unit is in northeast quarter of quadrangle in and adjacent to Kanab Creek. Total thickness as much as 60 ft (18 m)

Qlc LIMESTONE COLLUVIUM (PLEISTOCENE)—Partly consolidated, unsorted, unstratified deposit of cobbles and boulders as much as 1 ft (0.3 m) in diameter. Consists of subangular clasts of limestone, derived from limestone member of Carmel Formation, in a sandstone matrix, derived principally from Navajo Sandstone; cemented with calcium carbonate. Occurs as resistant hills on main body of Navajo Sandstone, south of cliffs capped with limestone member of Carmel Formation. Unit believed to be remnant of colluvial deposit. Thickness as much as 30 ft (10 m)

Qg GRAVEL (PLEISTOCENE)—Poorly consolidated, tan to pale-reddish-brown, calcareous, unsorted, poorly stratified sand, cobbles, and boulders. Larger clasts consist of pink, white, and black quartzite; tan sandstone; gray limestone; sparse dark-brown ironstone concretions; and rare basalt. In general, deposits slope toward Long Valley and are probably ancient pediment gravels. Thickness locally more than 200 ft (60 m)

Tgr REMNANT GRAVEL (PLIOCENE?)—Partly consolidated, coarsely bedded fluvial deposits of well-rounded sand, pebbles, and cobbles of gray and red quartzite, and gray, silicified limestone containing Paleozoic (Permian?) fossils, primarily corals and bryozoans. Map unit is in northwest quarter of quadrangle. Correlates with remnant gravel of Cashion (1967)

Ktd TROPIC SHALE AND DAKOTA SANDSTONE EQUIVALENT (UPPER CRETACEOUS)—Gray carbonaceous shale in upper part, underlain by coal-bearing shale and pale-brown and gray sandstone and conglomerate. Sandstone and conglomerate, below lowest coal, are probably equivalent to Dakota Sandstone. Exposed only in northwest quarter of quadrangle. Incomplete section; thickness more than 210 ft (64 m)

CARMEL FORMATION (MIDDLE JURASSIC)

Jcw Winsor Member—Fine-grained to very fine grained, friable sandstone: Upper part is light gray to yellowish gray; lower part is red and pink. Lower one-quarter contains thin beds of reddish-brown mudstone. Unit weathers to smooth slopes. Thickness 180-200 ft (55-61 m)

Jcg Gypsiferous member—Upper half is gray and green gypsiferous limestone, sandstone, and shale. Lower half is white to very light gray, massive, ledge-forming gypsum. Thin fossiliferous limestone bed marks top of member. Thickness 45-55 ft (14-17 m)

Jcb Banded member—Alternating bands of light-gray to very light gray and reddish-brown, very friable, very thin bedded to thin-bedded sandstone and siltstone. Weathers to gentle slopes. Contact with overlying gypsiferous member is placed at base of thick gypsum bed but is generally approximately located because of poor exposure. Thickness 150-160 ft (46-49 m)

Jcl Limestone member—Consists of an upper, main part 200 ft (61 m) thick consisting of thin-bedded, gray and tan, silty, dense limestone and a lower part 16 ft (5 m) thick consisting of thin-bedded mudstone and sandstone. In most of area, upper part is composed of two massive, cliff-forming oolitic units separated by unit of thin-bedded shaley limestone and calcareous mudstone that forms slopes. Lower part consists of light-gray to brownish-gray mudstone and very fine grained sandstone. Contact with overlying banded member is placed at top of highest thick limestone, but exposure of contact is generally poor. Total thickness of member is about 215 ft (66 m)

Jtc TEMPLE CAP SANDSTONE (MIDDLE JURASSIC)—White Throne Member at top is very light gray to tan, fine-grained, crossbedded sandstone that generally weathers bluish gray. Sinawava Member at base consists of interbedded sandstone, silty sandstone, and mudstone. Total thickness 65-150 ft (20-46 m); unit thins to east

NAVAJO SANDSTONE

J Ꞧnm Main body (Jurassic and Triassic?)—White, light-gray, yellowish-gray, and reddish-orange, thickly crossbedded, medium- to fine-grained, well-sorted eolian quartzose sandstone. Lower half of unit is generally reddish brown. Colors are not confined to lithostratigraphic boundaries. Locally contains thin lenses of reddish-brown to reddish-purple, silty sandstone and mudstone. Forms massive cliffs. Thickness of unit is 1,800-2,000 ft (550-610 m)

Ꞧnl Lamb Point Tongue (Upper Triassic?)—Grayish-white to grayish-orange, fine-grained to very fine grained, crossbedded sandstone of eolian origin. Top 10-15 ft (3-5 m) locally shows penecontemporaneously deformed beds that are beveled by overlying Tenney Canyon Member of Kayenta Formation. Lower contact is gradational. Unit interfingers with main body of Kayenta Formation. Thickness 275-365 ft (84-111 m); thins to west

KAYENTA FORMATION (UPPER TRIASSIC?)

Ꞧkt Tenney Canyon Tongue—Pale-reddish-brown siltstone, mudstone, and very fine grained, very thin bedded to laminated sandstone, all of fluvial origin. Contacts with overlying main body of Navajo Sandstone and underlying Lamb Point Tongue of Navajo Sandstone are sharp and even. Thickness 115-150 ft (35-46 m); thins eastward

Ꞧkm Main body—Medium-reddish-brown to pale-red calcareous siltstone and mudstone. Contains light-gray siltstone marker bed that occurs in most of the quadrangle; this bed is 20-30 ft (6-9 m) thick and occurs 75-85 ft (23-26 m) above base of formation. Total thickness of unit is 270-350 ft (82-107 m)

Ꞧmo MOENAVE FORMATION (UPPER TRIASSIC?)—Consists of three members:

Springdale Sandstone Member, at top, is a pale-reddish-brown sandstone that forms prominent cliffs. Beds in this member are 1-10 ft (0.3-3 m) thick and consist of sweeping, low-angle fluvial crossbeds characteristically containing scattered pebble-size chips of reddish-brown mudstone (Wilson and Stewart, 1967). Crossbedded strata commonly are overlain and underlain by beds of finely laminated, reddish-brown mudstone and pellet conglomerate that are 1-2 in. (2.5-5 cm) thick. Upper half of member is locally stained pale greenish yellow. Thickness 175-185 ft (53-56 m); thickens eastward.

Underlying Whitmore Point Member is a greenish-gray to grayish-red, thin-bedded siltstone and claystone that averages about 85 ft (26 m) thick.

Dinosaur Canyon Member underlies Whitmore Point Member; it consists of pale- to medium-reddish-orange, thick-bedded to laminated calcareous sandstone and siltstone. Contact with underlying Chinle Formation is placed at top of highest prominent reddish-purple shale bed. Although obvious elsewhere, disconformity between Chinle and Moenave is very difficult to locate in Kanab quadrangle. Thickness of Dinosaur Canyon Member averages about 135-145 ft (41-44 m)

Ꞧc CHINLE FORMATION (UPPER TRIASSIC)—Shown only on cross section.

Ꞧcp Petrified Forest Member—Variegated light-gray, grayish-red, and purple claystone, clayey siltstone, clayey sandstone, and sandstone. Montmorillonitic throughout; weathers to frothy surface. Small fragments of petrified wood are locally common. Contact with underlying Shinarump Member is transitional. Complete section is not exposed in quadrangle, but thickness is calculated to be 700-800 ft (213-244 m)

Ꞧcs Shinarump Member—Cliff-forming unit of yellowish-brown conglomerate and conglomeratic sandstone. Conglomerate composed of rounded to subrounded quartz, quartzite, and chert pebbles in light-gray sandstone matrix. Conglomerate is underlain by as much as 5 ft (1.5 m) of light-gray, fine- to coarse-grained, wavy-bedded sandstone. Overlies and fills channels in Moenkopi Formation. White to light-gray petrified wood fragments as much as 3 ft (1 m) long are common. Thickness 25-50 ft (7.5-15 m). Not shown in cross section

Ꞧmp MOENKOPI FORMATION (MIDDLE? AND LOWER TRIASSIC)

Upper red member—Reddish-brown, laminated to thin-bedded, locally gypsiferous, calcareous mudstone, siltstone, and fine-grained sandstone; sandstone beds are resistant and form ledges. Exposed only south of Kanab, near Utah-Arizona state line, where incomplete section is about 30 ft (10 m) thick. Outside area of quadrangle, formation may be as much 1,000 ft (300 m) thick

CONTACT—Dotted where concealed; all contacts of Quaternary unconsolidated rock units are approximately located

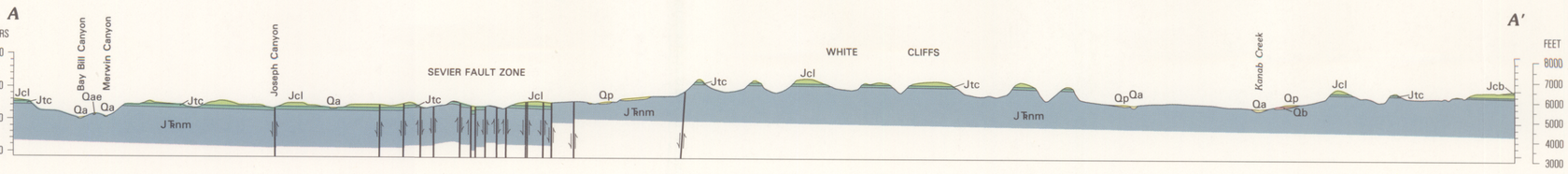
FAULT—Dashed where approximately located; dotted where concealed. Bar and ball on downthrown side

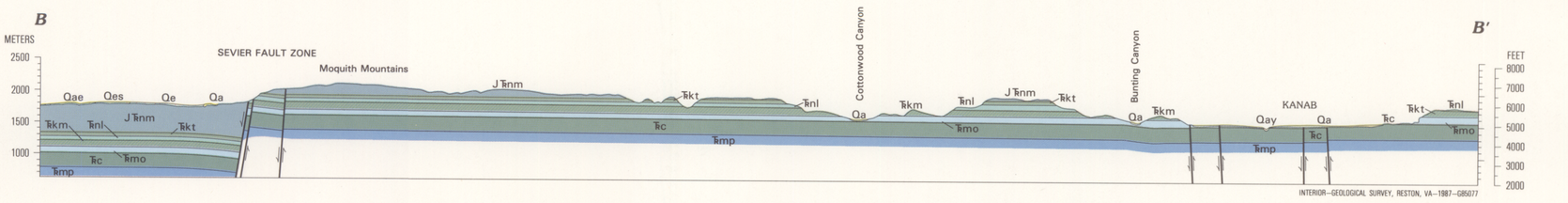
PROMINENT FRACTURE—Probable joint or possible fault. Most are very steeply dipping. Dashed where approximately located; dotted where concealed

STRIKE AND DIP OF BEDS
Inclined
Vertical
Horizontal

ADIT—Dug for quartz sand

GRAVEL PIT





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GEOLOGIC MAP OF THE KANAB QUADRANGLE, KANE COUNTY, UTAH, AND MOHAVE AND COCONINO COUNTIES, ARIZONA

By
K.A. Sargent and B.C. Philpott
1987

REFERENCES CITED

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Wilson, R. F., and Stewart, J. H., 1967, Correlation of Upper Triassic and Triassic (?) formations between southwestern Utah and southern Nevada: U.S. Geological Survey Bulletin 1244-D, 20 p.

For sale by Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225