U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
NATIONAL PARK SERVICE
and the KAIBAB-PAIUTE INDIAN TRIBE

SCIENTIFIC INVESTIGATIONS MAP 2863
Pamphlet accompanies map

Geologic Map of Pipe Spring National Monument and the Western Kaibab-Paiute Indian Reservation, Mohave County, Arizona

By

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2004

CORRELATION OF MAP UNITS

SURFICIAL DEPOSITS

Qaf, Qs, Qfp, Qps, Qes, Qd, Qae, Qv, Qtr, Qg1, Qa1, Ql	Holocene	QUATERNARY
Qg2, Qa2, Ql	Pleistocene	QUATERNARY
Qg3, Qa3	Pleistocene	QUATERNARY
QTg4	Pliocene(?)	TERTIARY

SEDIMENTARY ROCKS

Unconformity		
Jn, Jkt, Jnl, Jk	Lower Jurassic	JURASSIC
Unconformity		
Jms, Jmw, Jmd	Lower Jurassic	JURASSIC
Unconformity		
Tcp, Tcs	Upper Triassic	TRIASSIC
Unconformity		
Tmu, Tms, Tmm, Tmv	Middle (?) Triassic	TRIASSIC
Tmv, Tml	Lower Triassic	TRIASSIC
Unconformity		
Tml	Lower Triassic	TRIASSIC
Unconformity		
Pkh, Pkf	Lower Permian	PERMIAN

UNITS SHOWN ONLY IN CROSS SECTION

Unconformity		
Ptw, Ptb, Pts	Lower Permian	PERMIAN

LIST OF MAP UNITS

SURFICIAL DEPOSITS

- Qaf — Artificial fill and quarries (Holocene)
- Qs — Stream-channel alluvium (Holocene)
- Qfp — Floodplain deposits (Holocene)
- Qps — Ponded sediments (Holocene)
- Qes — Eolian sand sheet deposits (Holocene)
- Qd — Eolian sand dune deposits (Holocene)
- Qae — Mixed eolian and fluvial deposits (Holocene)
- Qv — Valley-fill alluvial deposits (Holocene)
- Qtr — Talus and rock fall deposits (Holocene)
- Qg1 — Young alluvial terrace-gravel deposits (Holocene)
- Qa1 — Young alluvial fan deposits (Holocene)
- Qg2 — Intermediate alluvial terrace-gravel deposits (Holocene and Pleistocene(?))
- Qa2 — Intermediate alluvial fan deposits (Holocene and Pleistocene(?))
- Ql — Landslide debris deposits (Holocene and Pleistocene)
- Qg3 — Old alluvial terrace-gravel deposits (Pleistocene)
- Qa3 — Old alluvial fan deposits (Pleistocene)
- QTg4 — Oldest alluvial terrace-gravel deposits (Pleistocene and Pliocene(?))

SEDIMENTARY ROCKS

- Jn — Navajo Sandstone (Lower Jurassic)
- Jkt — Tenney Canyon Tongue of the Kayenta Formation (Lower Jurassic)
- Jnl — Lamb Point Tongue of the Navajo Sandstone (Lower Jurassic)
- Jk — Kayenta Formation (Lower Jurassic)

Moenave Formation (Lower Jurassic)
- Jms — Springdale Sandstone Member
- Jmw — Whitmore Point Member
- Jmd — Dinosaur Canyon Member

Chinle Formation (Upper Triassic)
- Tcp — Owl Rock and Petrified Forest Members, undivided
- Tcs — Shinarump Member

Moenkopi Formation (Middle(?) and Lower Triassic)
- Tmu — Upper red member (Middle(?) and Lower Triassic)
- Tms — Shnabkaib Member (Lower Triassic)
- Tmm — Middle red member (Lower Triassic)
- Tmv — Virgin Limestone Member (Lower Triassic)
- Tml — Lower red member and Timpoweap Member, undivided (Lower Triassic)

Kaibab Formation (Lower Permian)
- Pkh — Harrisburg Member
- Pkf — Fossil Mountain Member

UNITS SHOWN ONLY IN CROSS SECTION

Toroweap Formation (Lower Permian)
- Ptw — Woods Ranch Member
- Ptb — Brady Canyon Member
- Pts — Seligman Member

EXPLANATION

- **Contact**—Dashed where Jkt becomes Jk; approximate contact for alluvial units only
- **Fault**—Dashed where inferred or approximately located; dotted where concealed; bar and ball on downthrown side. Faults shown as bounding alluvium do not offset alluvium. Number is estimated separation displacement in feet (76)
- **Folds**—Showing trace of axial surface and direction of plunge; dotted where concealed
  - **Syncline**
  - **Monocline**
- **Strike and dip of beds**
  - **Inclined**—Measured in the field (14)
  - **Implied**—Interpreted from aerial photographs; dip amount not determined
- **Strike of vertical and subvertical joints**
- **Collapse structure**—Circular collapse structures characterized by strata dipping inward toward central point. On Kaibab Formation surface (Pkh), may reflect collapse of deep-seated breccia pipe that originated in Redwall Limestone (C)
- **Kaibab-Paiute Indian Reservation Boundary**

Base from U.S. Geological Survey, 1:24,000, Moccasin, Kaibab, Pipe Valley, and Pipe Spring, 1988

Universal Transverse Mercator Projection
1927 North American Datum
Clark 1866 Ellipsoid, Zone 12

DECLINATION, 2003
13°
TRUE NORTH
GRID NORTH
APPROXIMATE MEAN

SCALE 1:31,680
1 1/2 0 1 MILE
1 .5 0 1 KILOMETER
CONTOUR INTERVAL 20 AND 40 FEET

ARIZONA
MAP LOCATION

Geology mapped in 2002 and 2003 by G.H. Billingsley
Digital database by Susan S. Priest and Tracey Felger
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