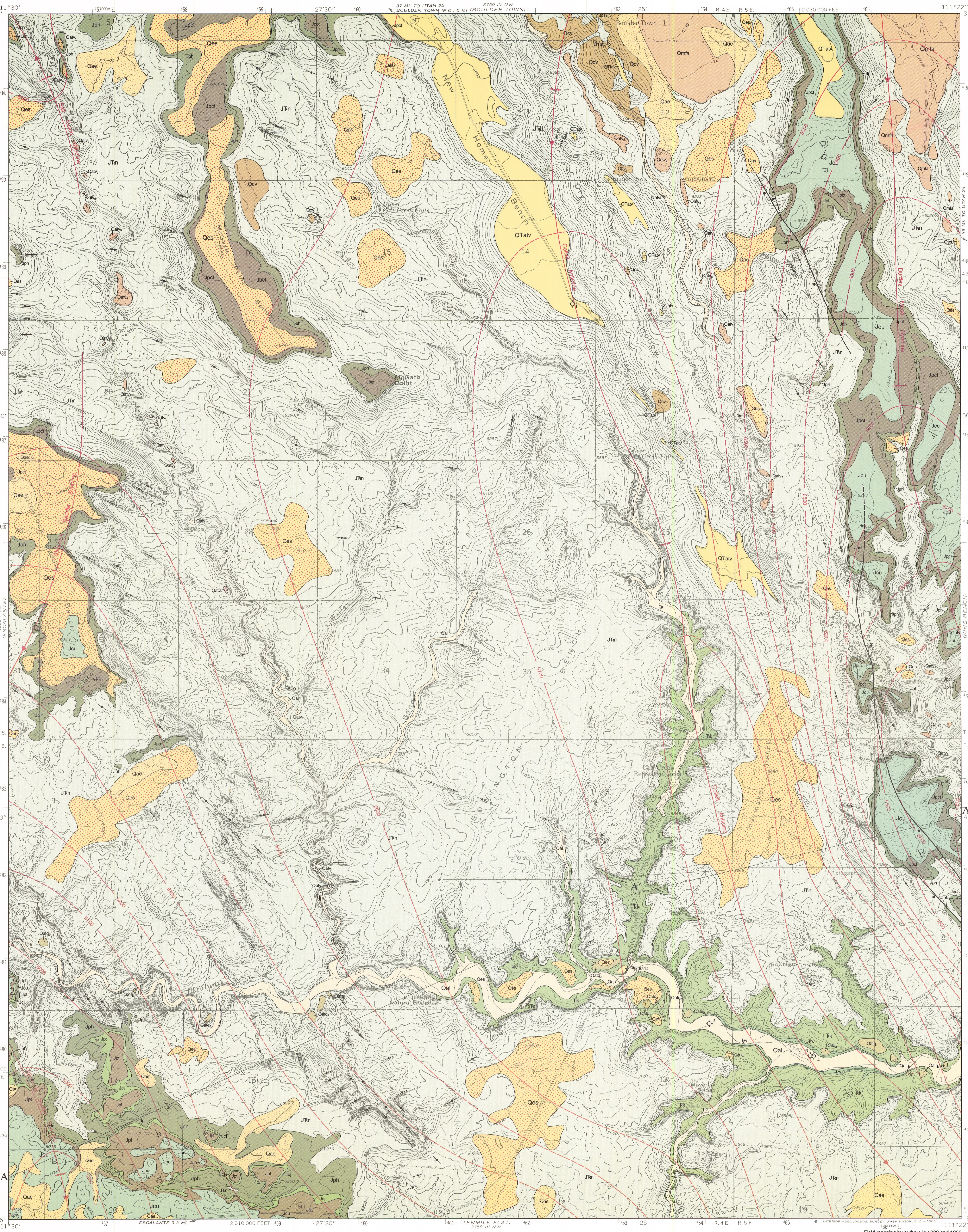
UTAH GEOLOGICAL AND MINERAL SURVEY
UTAH DEPARTMENT OF NATURAL RESOURCES
in cooperation with
THE UNITED STATES GEOLOGICAL SURVEY

Plate 1
Utah Geological and Mineral Survey Map 120
Geologic Map of the Calf Creek Quadrangle



Base map from U.S. Geological Survey, Calf Creek Quadrangle 1964

Field mapping by authors in 1980 and 1986
Kent D. Brown, Cartographer

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 20-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1989 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION

GEOLOGIC MAP OF THE CALF CREEK QUADRANGLE, GARFIELD COUNTY, UTAH

by
Gordon W. Weir and L. Sue Beard
U.S. Geological Survey

1990

CONTACT — Boundaries of surficial deposits approximately located.

FAULT — Dashed where inferred; dotted where concealed; bar and ball on downthrown side. Arrows on cross section indicate direction of relative movement.

ANTICLINE — Showing trace of axial plane and plunge of axis; dashed where approximately located.

SYNCLINE — Showing trace of axial plane and plunge of axis; dashed where approximately located.

STRIKE AND DIP OF BEDS

6 Inclined

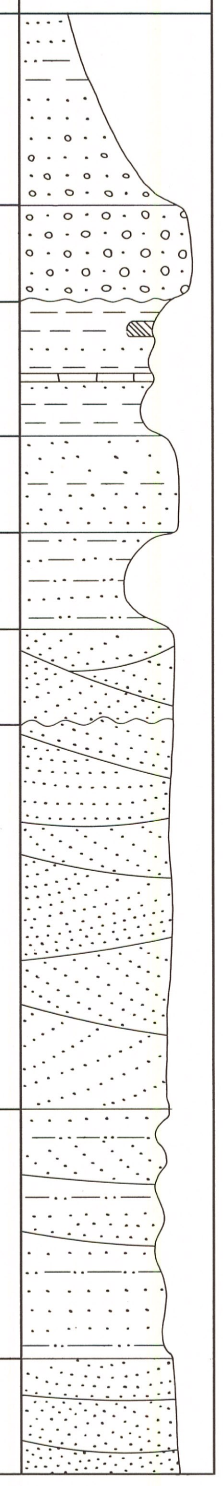
STRIKE OF VERTICAL AND NEAR-VERTICAL JOINTS

BORROW PIT

OIL WELL — Dry hole, showing name of well.

STRUCTURE CONTOURS — Drawn on top of Navajo Sandstone. Long dashed where control less accurate. Short dashed where datum above land surface. Contour interval 100 ft.

FORMATION	SYMBOL	THICKNESS (feet)	LITHOLOGY
Surficial deposits	Q	0-50	
Highest volcanic-gravel terrace alluvium	QTatv	0-50	
Upper member of the Carmel Formation	Jcu	120+	
Thousand Pockets Tongue of the Page Sandstone	Jpt	40-80	
Judd Hollow Tongue of the Carmel Formation	Jcj	10-40	
Harris Wash Tongue of the Page Sandstone	Jph	60-120	
Navajo Sandstone	JTRn	1300-1500	
Kayenta Formation	TRk	280-320	
Wingate Sandstone	TRw	100+	



DESCRIPTION OF MAP UNITS

Qal — Floodplain alluvium — *Fine sand and silt and local admixtures of gravel.*

Qes — Eolian sand — *Fine to very fine sand and silt.*

Qae — Sheetwash alluvium and eolium — *Silt, sand, and small rock fragments.*

Qatq$_1$ — Low quartzite-gravel terrace alluvium — *Chiefly well-rounded cobbles of quartzite and lesser amounts of basaltic andesite and other resistant rocks on benches 10-20 feet above the Escalante River.*

Qatv$_1$ — Low volcanic-gravel terrace alluvium — *Pebbles to boulders of basaltic andesite and small amounts of clasts of sandstone as much as 50 feet above Sand and Boulder Creeks.*

Qmfa — Volcanic-gravel debris-flow colluvium and alluvium — *Angular to rounded clasts of basaltic andesite in unsorted colluvium that grades downslope to well-sorted alluvium.*

Qcv — Volcanic-gravel colluvium — *Rounded clasts of basaltic andesite chiefly on steep slopes.*

Qatq$_2$, Qatq$_3$ — Intermediate quartzite-gravel terrace alluvium — *Chiefly well-rounded cobbles of quartzite and lesser amounts of basaltic andesite and other resistant rocks on benches 40-80 feet (Qatq$_2$) and 120-160 feet (Qatq$_3$) above the Escalante River.*

Qatv$_2$, Qatv$_3$ — Intermediate volcanic-gravel terrace alluvium — *Pebbles to boulders of basaltic andesite and small amounts of sandstone clasts on benches 80-100 feet (Qatv$_2$) and 190-260 feet (Qatv$_3$) above stream level.*

Qatq$_4$ — High quartzite-gravel terrace alluvium — *Chiefly well-rounded cobbles of quartzite and lesser amounts of basaltic andesite and other resistant rocks on benches about 200 feet above the Escalante River.*

Qatv$_4$ — High volcanic-gravel terrace alluvium — *Pebbles to boulders of basaltic andesite and small amounts of sandstone clasts on benches 350-380 feet above Sweetwater Creek.*

QTatv — Highest volcanic gravel terrace alluvium — *Pebbles to boulders of basaltic andesite and small amounts of clasts of chert and sandstone on a pre-canyon surface more than 600 feet above stream level.*

UNCONFORMITY

Jcu — Upper member of the Carmel Formation — *Reddish-brown shale, reddish-brown and yellowish-gray, very fine to fine-grained sandstone.*

Jpt — Thousand Pockets Tongue of the Page Sandstone — *Chiefly yellowish-gray to very light gray, fine- to medium-grained sandstone; commonly contorted. Shown separately in southwest corner of quadrangle; elsewhere combined with underlying Judd Hollow Tongue of the Carmel Formation in map unit Jpct.*

Jpct — Thousand Pockets Tongue of the Page Sandstone and Judd Hollow Tongue of the Carmel Formation combined.

Jcj — Judd Hollow Tongue of the Carmel Formation — *Moderate-reddish-brown siltstone and light-gray to reddish-brown, fine-grained sandstone; commonly contorted. Shown separately in southwest corner of quadrangle; elsewhere combined with Thousand Pockets Tongue of the Page Sandstone in map unit Jpct.*

Jph — Harris Wash Tongue of the Page Sandstone — *Grayish-orange, cross-bedded fine-grained sandstone.*

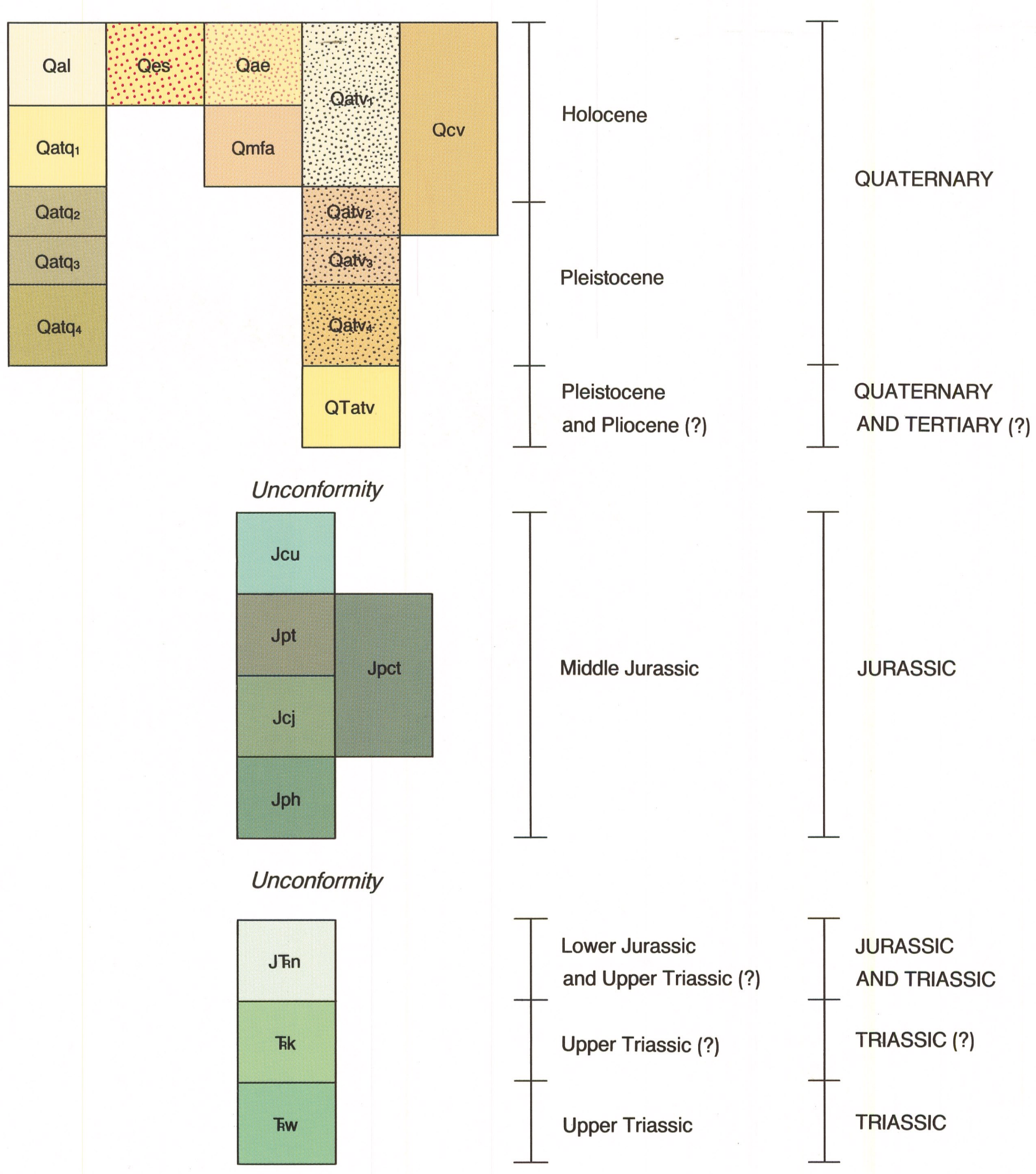
UNCONFORMITY

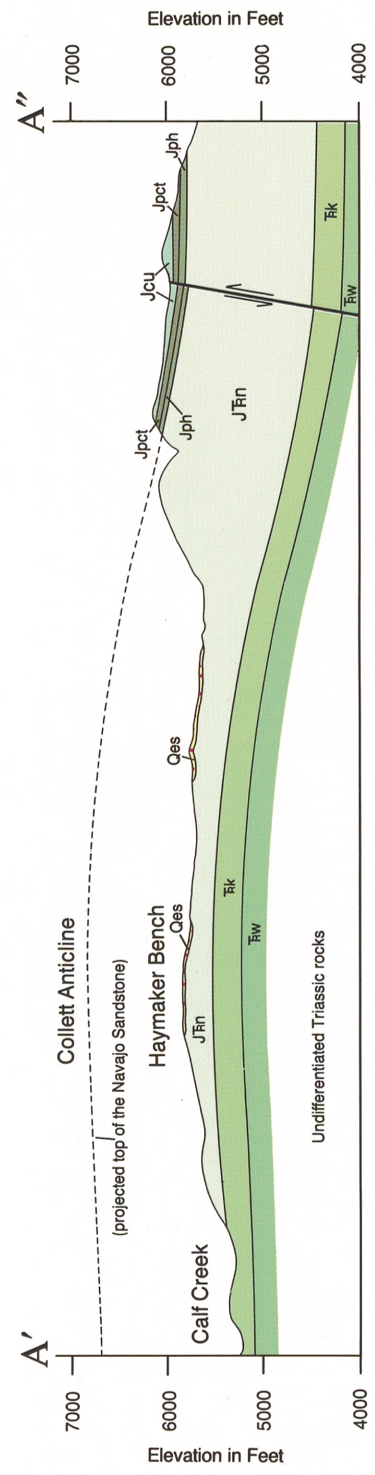
JTRn — Navajo Sandstone — *Chiefly grayish-orange, crossbedded, fine-grained sandstone.*

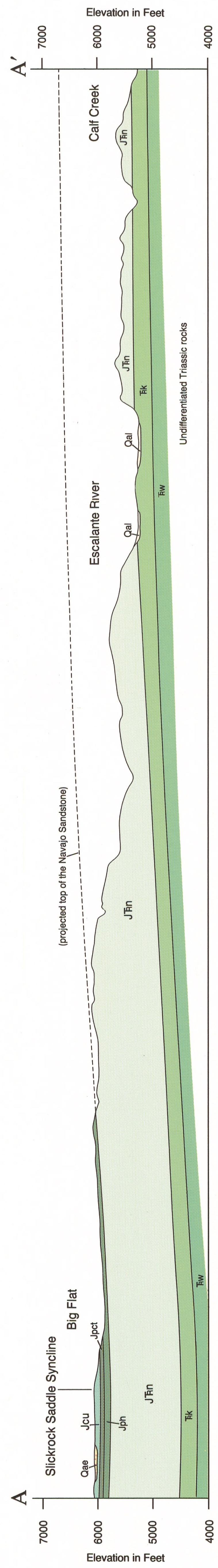
TRk — Kayenta Formation — *Grayish-red to dusky-red, fine-grained sandstone interbedded with lesser amounts of dusky-red siltstone.*

TRw — Wingate Sandstone — *Grayish-red to grayish-orange, crossbedded fine-grained sandstone.*

CORRELATION OF MAP UNITS







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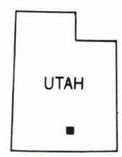

UTAH GEOLOGICAL AND MINERAL SURVEY
a division of
UTAH DEPARTMENT OF NATURAL RESOURCES
MAP 120 **1990**

UTAH GEOLOGICAL AND MINERAL SURVEY

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Salt Lake City, Utah 84108-1280

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GEOLOGIC MAP OF THE CALF CREEK QUADRANGLE, GARFIELD COUNTY, UTAH

By

Gordon W. Weir[1] *and L. Sue Beard*[1]

INTRODUCTION

The Calf Creek quadrangle, central Garfield County, south-central Utah, lies in the Circle Cliffs-Teasdale section of the Colorado Plateau physiographic province (Stokes, 1977). The rugged landscape is characterized by mesas, flat-topped ridges, and uneven benches bordered by irregular steep cliffs that descend to deep, narrow canyons. Total relief in the quadrangle is more than 1600 feet (480 m); local relief is commonly several hundreds of feet.

Only two residences are within the quadrangle. The permanent population is probably less than five, but during the summer months a score or more tourists generally are camping in the Calf Creek Recreation Area. The nearest towns are Escalante (1980 population, 652), about 9 miles (14 km) by road west of the quadrangle, and Boulder (1980 population, 190), about 5 miles (8 km) by road north of the quadrangle. The Escalante-Boulder road, shown on the map as highway 54 but now designated Utah Highway 12, is the principal paved road in central Garfield County. It is much traveled by tourists as well as by residents of nearby towns. Sandy jeep trails cross McGath Point Bench, Haymaker Bench, and Big Flat. A large part of the quadrangle is inaccessible by car and difficult to traverse on foot.

Mesa tops are covered by a sparse juniper, sagebrush, and cactus desert vegetation, but most of the rocky canyon lands are bare except for hardy grasses on stable patches of sand. The principal streams in the area, the Escalante River and its tributaries Sand, Calf, and Boulder Creeks, have large ranges in seasonal and annual flow. The major periods of flow are in the spring from melting of highland snow and in midsummer from sporadic torrential downpours.

The area was included in smaller scale geologic maps by McFall and Peterson (1971), Hackman and Wyant (1973), Doelling (1974), Sargent and Hansen (1982), and Williams (1985). Detterman (1955) prepared a photogeologic map of the quadrangle. The present geologic map is based in part on field work in 1978-80 assessing mineral resources of wilderness areas near Escalante (Weir and Beard, 1981a, b).

STRATIGRAPHY

Bedrock formations exposed in the Calf Creek quadrangle range in age from Late Triassic to Middle Jurassic and total about 2000 feet (600 m) in thickness. Thin surficial deposits cover parts of the quadrangle.

TRIASSIC SYSTEM

Upper Triassic Series

Wingate Sandstone (Ꞧw) — The Wingate is grayish-red to grayish-orange sandstone composed of well-sorted, very fine to fine, subrounded grains of quartz that are well cemented by iron oxide and calcite. The sandstone is in large planar and trough sets of crossbeds separated by thin sets of tabular beds. The formation crops out only along the Escalante River in the southeastern part of the quadrangle; about 100 feet (30 m) is exposed. The Wingate ranges in thickness from about 230 to 350 feet (101-107 m) in adjacent areas to the east (Davidson, 1967, p. 35; Weir and Beard, 1981a).

Upper Triassic(?) Series

Kayenta Formation (Ꞧk) — The Kayenta consists of sandstone and lesser amounts of siltstone. The grayish-red to dusky-red sandstone is composed chiefly of fine grains of quartz, feldspar, and mica cemented by calcite. It is mostly in small- to medium-scale sets of horizontal beds and planar and trough sets of crossbeds. Dusky-red siltstone is in thin sets of tabular beds irregularly interstratified with sandstone.

The Kayenta forms steep, ledgy slopes and irregular benches. Upper and lower contacts are commonly obscure in a zone, 20 to 60 feet (6-18 m) thick, of transitional lithology characterized by alternating units of crossbedded sandstone and planar beds of siltstone and sandstone. Mapped contacts

[1]*Geologist, U.S. Geological Survey, Flagstaff, Arizona*

are arbitrarily placed at the base of the transitional lithology. The Kayenta is about 280-320 feet (85-97 m) thick along the Escalante River in the southeastern part of the quadrangle. The formation thickens eastward and is as much as 400 feet (120 m) thick in adjacent areas (Davidson 1967, p. 36; Weir and Beard 1981a).

TRIASSIC(?) AND JURASSIC SYSTEMS

Upper Triassic(?) and Lower Jurassic Series

Navajo Sandstone (J₸n) — The Navajo Sandstone is composed almost wholly of well-sorted, subrounded, frosted, very fine to medium grains of clear quartz and very small amounts of white chert and feldspar. The sandstone is mostly very light grayish orange, but locally reddish-gray to yellowish-orange rock is conspicuous. Reddish-orange to black iron staining occurs sporadically. The rock is poorly to well cemented by calcite and weathers to loose sand. The sandstone is characterized by large-scale trough sets, commonly 6 to 18 feet (1.8-5.4 m) thick, of high-angle crossbeds. Contorted beds are locally common; tabular beds are rare. Grayish-red siltstone is irregularly interstratified in sparse thin lenses, mostly near the base of the formation. The formation erodes to form towering cliffs, fin-like ridges, irregularly rounded knobs, and hummocky mesa tops, which are commonly mantled with a thin layer of locally derived sand. The total thickness of Navajo is about 1300 to 1500 feet (396-457 m) as indicated by logs of exploratory wells in the area (Heylmun and others, 1965, p. 68-71, and unpublished records in the files of the U.S. Bureau of Land Management, Salt Lake City, Utah).

JURASSIC SYSTEM

Middle Jurassic Series

Harris Wash Tongue of the Page Sandstone (Jph) — The lower tongue is light- to moderate-grayish-orange, fine-grained quartz sandstone in large-scale trough sets, commonly 3 to 18 feet (1-5.4 m) thick. The Harris Wash is lithologically similar to the underlying Navajo Sandstone and was included in the Navajo by most previous workers. It is separated from that formation by an obscure unconformity marked by sparse granules and very small pebbles of chert (Peterson and Pipiringos, 1979, p. 20-29). It is separated from the Thousand Pockets Tongue of the Page Sandstone by the Judd Hollow Tongue of the Carmel Formation. The Harris Wash forms a ledge that caps cliffs and mesas carved in the Navajo Sandstone. The tongue ranges in thickness from about 60 to 120 feet (18-36 m).

Thousand Pockets Tongue of the Page Sandstone (Jpt and upper part of Jpct) — This unit is mostly yellowish-gray to very light gray, fine- to medium-grained quartz sandstone. A conspicuous layer, as much as 10 feet thick (3 m), of reddish-brown calcitic siltstone lies near the middle of the tongue. Trough and planar sets of crossbeds are dominant in the sandstone, but tabular beds occur. Much of the bedding is wavy and locally the whole unit is contorted. The tongue forms a ledge that caps several mesas and ranges irregularly in thickness from about 40 to 80 feet (12-24 m). The Thousand Pockets is mapped separately only in the southwestern part of the quadrangle. Elsewhere it is combined with the underlying thin Judd Hollow Tongue of the Carmel Formation as map unit Jpct.

Judd Hollow Tongue of the Carmel Formation (Jcj and lower part of Jpct) — This tongue, interstratified between tongues of the Page Sandstone, consists of thin beds of moderate-reddish-brown siltstone and light-gray to reddish-brown, fine-grained sandstone. The base is commonly marked by a thin set, several inches to a few feet thick, of tabular beds of iron-stained sandstone. Above the basal set, beds are commonly wavy and in places markedly contorted along with beds in the overlying Thousand Pockets Tongue of the Page Sandstone. The Judd Hollow is a poorly exposed slope-forming unit of irregular thickness ranging from about 10 to 40 feet (3-12 m). The tongue is too thin to map separately except in the southwestern part of the quadrangle; elsewhere it forms the lower part of the unit labelled Jpct on the map.

Upper member of the Carmel Formation (Jcu) — The upper member constitutes the bulk of the formation and is composed of shale and sandstone. The silty to clayey shale is reddish brown mottled by greenish gray and light grayish yellow. The sandstone is moderate reddish brown and yellowish gray, very fine to fine grained, commonly silty, and poorly to firmly cemented by calcite and iron oxides. The upper member is generally poorly exposed on an irregular slope interrupted by minor ledges. Only about 120 feet (36 m) of the upper member is preserved in this quadrangle; in adjacent areas it contains notable amounts of gypsum and attains a thickness of 250-500 feet (76-152 m) (Weir and Beard, 1981a, b).

TERTIARY(?) AND QUATERNARY SYSTEMS

Pliocene(?) and Pleistocene Series

Highest volcanic-gravel terrace alluvium (QTatv) — This alluvium is composed mainly of rounded cobbles and boulders, as much as 4 feet (1.2 m) across, of dark-gray to dark-brown basaltic andesite and minor amounts of other volcanic rocks in a matrix of pebbles and sand. Locally, near the base of the deposits are cobbles of resistant sandstone from local bedrock formations. Yellow-brown, red, and orange chert in irregular blocks and small rounded pebbles of black chert are sparse but locally conspicuous. The deposits are generally poorly consolidated; they are irregularly cemented with calcite. Many boulders and cobbles are coated in whole or part with white to light-yellowish-gray, pedogenic calcium carbonate. Bedding is obscure, but a few exposures display crudely graded beds and trough sets of crossbeds in channel fills. The deposits are veneered irregularly by wind-blown sand.

These volcanic gravels are stream deposits, probably derived from debris slides and flows from the volcanic terrane of the Aquarius Plateau north of this quadrangle (Williams, 1985), The gravels are the same as the pediment gravels of Hackman and Wyant (1973, sheet 1) and Weir and Beard (1981a). The deposits lie about 500 to more than 600 feet (152-183 m) above stream level on a southward-sloping and truncating surface that predates canyon cutting by the Escalante River and its tributaries. The deposits attain a maximum thickness of about 50 feet (15 m) on New Home Bench in the northern part of the quadrangle.

QUATERNARY SYSTEM

Pleistocene Series

High volcanic-gravel terrace alluvium ($Qatv_4$) — This gravel is composed chiefly of rounded pebbles to boulders of dark-gray to dark-brown vesicular basaltic andesite and minor admixture of pebbles to cobbles of sandstone. The sparse matrix is dark-brown, fine to medium sand. The deposits are unconsolidated and form irregular heaps of stones, as much as 30 feet (9 m) thick, perched on small knobs about 350-380 feet (106-115 m) above Sweetwater Creek in the northwest corner of the quadrangle.

High quartzite-gravel terrace alluvium ($Qatq_4$) — These unconsolidated gravels are composed of well-rounded pebbles to cobbles, as much as 8 inches (20 cm) in diameter, of light-gray, light-brownish-gray, reddish-gray, and very dark gray quartzite, chert, and fine-grained metamorphic rocks and small amounts of pebbles to boulders of dark-gray to dark-brown, vesicular basaltic andesite.

The sparse matrix is light-brown, fine to medium sand. The deposits form irregular sheets and heaps of stones, covered by thin patches of windblown sand. The gravels are as much as 10 feet (3 m) thick and rest on benches cut in the Navajo Sandstone about 200 feet (60 m) above the Escalante River.

Pleistocene and Holocene(?) Series

Intermediate volcanic-gravel terrace alluvium ($Qatv_2$, $Qatv_3$) — These deposits are lithologically similar to the high volcanic-gravel terrace-alluvium ($Qatv_4$) described above. They occur as small piles of loose stones, as much as 30 feet (9 m) thick, resting on benches cut in the Navajo Sandstone above Sand and Boulder Creeks. The gravels are the products of at least two periods of deposition. The younger intermediate volcanic-gravel terrace alluvium ($Qatv_2$) is about 80-100 feet (24-30 m) above the creeks; the older deposits ($Qatv_3$) are about 190-260 feet (58-79 m) above the creeks.

Intermediate quartzite-gravel terrace alluvium ($Qatq_3$, $Qatq_2$,) — These gravels are lithologically similar to high quartzite-gravel terrace alluvium ($Qatq_4$). They occur as small patches, commonly veneered by windblown sand on benches cut in the Navajo Sandstone along the Escalante River. The deposits, as much as 20 feet (6 m) thick, probably represent more than two episodes of deposition. The younger intermediate quartzite-gravel terrace alluvium ($Qatq_2$) is about 40-80 (12-24 m) feet above the river; the older deposits ($Qatq_3$) are about 120-160 feet (36-48 m) above the river.

Pleistocene(?) and Holocene Series

Volcanic-gravel colluvium (Qcv) — These unconsolidated deposits consist chiefly of rounded cobbles and boulders of basaltic andesite and a few clasts of Navajo Sandstone in a matrix of dark-brown, pebbly sand. The material was derived mainly by creep and sliding from the highest volcanic-gravel terrace alluvium (QTatv). Most of the deposits are intermittently active on steep slopes of Navajo Sandstone in the northern part of the quadrangle. Deposits on gentle slopes and benches in secs. 9 and 16, T. 34 S., R. 4 E. apparently represent an older generation of colluvium, because the local sources of volcanic gravels have been removed by erosion. The colluvium on slopes facing Boulder Creek near the north edge of the quadrangle is estimated to be as much as 30 feet (9 m) thick. The colluvium is generally not shown where bedrock contacts are readily inferred.

Holocene Series

Volcanic-gravel debris-flow colluvium and alluvium (Qmfa) — These deposits are unsorted, poorly stratified, debris-flow gravels that grade southward to fair-sorted, stratified and cross-stratified, alluvial gravels. They lie on surfaces that slope about 1.5 degrees southward. The gravels are composed chiefly of angular to rounded pebbles to boulders, as much as 3 feet (9 m) in diameter, of dark-gray and dark-brown, vesicular basaltic andesite and small amounts of light-gray to black, rounded pebbles and cobbles of quartzite and chert. The matrix is light-brown to light-gray, fine to coarse sand. The gravels are for the most part unconsolidated but in places are weakly cemented by caliche. They are locally veneered by wind-blown sand. The deposits are as much as 50 feet (15.24 m) thick on lowland flats near the northeast corner of the quadrangle.

Low volcanic-gravel terrace alluvium ($Qatv_1$) — These gravels, probably of several generations, are lithologically similar to the intermediate and high volcanic-gravel terrace alluviums ($Qatv_2$, $Qatv_3$, $Qatv_4$). The gravels, which are probably as much as 15 feet (4.5 m) thick, form low terraces above Sand Creek and fill the channel of Boulder Creek in the northeastern part of the quadrangle. The tops of the deposits are as much 50 feet (15 m) above the creeks.

Low quartzite-gravel terrace alluvium ($Qatq_1$) — These gravels are lithologically similar to the intermediate and high quartzite-gravel terrace alluviums ($Qatq_2$, $Qatq_3$, $Qatq_4$) but contain more clasts of basaltic andesite. The gravels are well exposed on a bench only 10 to 20 feet (3-6 m) above the north bank of the Escalante River on the west side of the Escalante-Boulder road. They are about 10 feet (3 m) thick. Similar deposits of young gravels along the river are too small to show separately and have been generally included in the floodplain alluvium (Qal).

Sheetwash alluvium and eolium (Qae) — These deposits, formed by water flowing in sheets and shallow channels and locally modified by wind, consist of yellowish-brown to dark-reddish-brown and grayish-orange-pink silt, sand, and small rock fragments. They locally contain and intergrade with wind-blown sand. They form relatively smooth-surfaced patches on flats and gentle slopes and are most extensive on the Navajo Sandstone. Only the larger patches are shown. These deposits are probably not more than 10 feet (3 m) thick.

Eolian Sand (Qes) — These deposits are dominantly wind-blown sand, but some reworking by sheetwash is common, and in places the eolium includes sandy residuum only partly modified by wind. The sand is mostly very fine to fine grained and yellowish gray to pale red. Sand on McGath Point Bench in the northwestern part of the quadrangle is mostly residual and includes reddish-brown silt and small angular fragments of pale-red sandstone and siltstone. Most eolian sand is locally derived from sandstone bedrock and forms broad thin sheets on irregular surfaces. The most extensive deposits are on Navajo Sandstone uplands. Distinct dune forms are lacking but a few sand sheets have northeast-trending ridges. Some sand has been stabilized by desert grasses, but most of the sheets are probably altered during windstorms. Only the larger sand sheets are shown. The eolian sand attains a maximum thickness of about 20 feet (6 m) on Haymaker Bench in the southeastern part of the quadrangle.

Floodplain alluvium (Qal) — Alluvium on modern floodplains and in narrow channels in this quadrangle consists of yellowish-gray to grayish-orange-pink silt and fine sand and variable admixtures of pebbles to boulders of basaltic andesite, quartzite, and sandstone. Ripple laminations, trough crossbedding, graded bedding, and imbricated gravels occur locally in these deposits. Only the relatively wide and long strips of alluvium are shown. The deposits are probably as much as 20 feet (6 m) thick along the Escalante River.

STRUCTURAL GEOLOGY

The dominant structures in this quadrangle are the Collett anticline, the flanking Slickrock Saddle and Salt Gulch synclines on the west, and the south-plunging Durffey Mesa syncline on the east. The Salt Gulch and Slickrock Saddle synclines are parts of a regional downfold called the Sand Creek syncline by Hackman and Wyant (1973, sheet 2). Hackman and Wyant also included the Durffey Mesa syncline in a similar regional downfold, the Harris Wash syncline.

The west flank of the Durffey Mesa syncline is cut by several minor faults. Displacements are small. The maximum offset is about 50 feet (15 m) in sec. 5, T. 35 S., R. 5 E. on a fault which continues more than 4 miles (6.4 km) to the southeast (Weir and Beard, 1981a).

The Navajo Sandstone which crops out over much of the quadrangle is cut by many vertical and near-vertical joints. The joints are for the most part closely spaced and, although locally obscure, are generally conspicuous because they control many small topographic forms. Not all joints are shown on the map; the symbols indicate representative well-defined sets of joints. The joint pattern is in places complex, but rectilinear northeast and northwest trends are dominant.

ECONOMIC GEOLOGY

There are no mines or prospects in the quadrangle area. Geochemical reconnaissance which included the quadrangle and adjoining areas did not indicate the presence of mineral terranes (Weir and Lane, 1981a,b, 1983).

Small, low-grade uranium-copper deposits are in Triassic formations in the Circle Cliffs about 15 miles (24 km) east of this quadrangle (Davidson, 1967, p. 65-91; Doelling, 1975, p. 107-109, 131-135). The same Triassic formations underlie the Calf Creek quadrangle at depths of many hundreds to several thousands of feet. They perhaps contain similar small, low-grade deposits, but they are unlikely to warrant exploration.

The oil and gas potential of the Calf Creek quadrangle has been tested by four wells drilled on the Collett anticline (table 1), the major fold in the quadrangle. Three of the wells were dry; one had shows of oil in rocks of Permian age. Oil is produced in the Upper Valley field (Peterson, 1973; Sharp, 1976), about 15 miles (24 km) west-southwest of the quadrangle, from Triassic and Permian strata from the west flank of a fold similar to the Collett anticline. Five wells on the similar Escalante anticline, a few miles west of the quadrangle, had flows of CO_2 gas, and two of the wells were completed for possible production of carbon dioxide (Brandt, 1987). By analogy with these productive folds, the Collett anticline in the Calf Creek quadrangle may have a potential for commercial oil and gas that has not been fully tested.

Road material has been quarried on a small scale in the quadrangle and in nearby areas from Pliocene(?)-Pleistocene terrace alluvium along the Escalante-Boulder highway.

Table 1. *— Record of exploratory wells drilled in the Calf Creek quadrangle, Utah [Wells drilled are as of 1986. All wells are abandoned. Sources of data: Heylmun and others (1965), and unpublished records of the Utah Geological and Mineral Survey and the U.S. Bureau of Land Management, Salt Lake City, Utah]*

Map Reference #	Operator and Well No.	Year Completed	Total Depth (Feet)	Oldest Formation Penetrated	Remarks
1	Mountain Fuel Supply Co. 1 Collett	1969	3,225	White Rim Sandstone Member of Cutler Formation (Permian)	Dry
2	D.H. Peaker 1-A Gates	1956	4,303	Molas Formation (Mississippian)	Oil shows in Kaibab Limestone and Coconino Sandstone (Permian)
3	George C. Travis 2	1967	4,411	Leadville Limestone (Mississippian)	Dry
4	George C. Travis 1	1966	1,950	Kaibab Limestone (Permian)	Dry

The major natural resource in the quadrangle is the magnificent canyon and rock-monument scenery created by the erosion of the Navajo Sandstone. Calf Creek Falls and the nearby Calf Creek Recreation Area maintained by the Bureau of Land Management, are popular tourist sites. Many hikers traverse the desert and riverside trails (U.S. Bureau of Land Management, 1979; Lambrechtse, 1985).

GEOLOGIC HAZARDS

Floods are the chief natural hazard in the Calf Creek quadrangle. Summertime cloudbursts in the northern part of the quadrangle or adjacent areas can result in rock-laden floods suddenly coursing down narrow canyons. In addition, temporary dams formed by rockfalls may give way to release an unexpected torrent far downstream. Hikers traversing the cliff-and-canyon country should also beware of falling rocks as well as flash floods. Areas of quicksand are a possible danger along the Escalante River.

Care should be taken for any construction on surficial deposits. Volcanic-gravel colluvium (Qcv) and alluvial and eolian sand (Qae, Qes) may be unstable even on moderate slopes.

Seismic risks in the quadrangle appear small. Only two earthquakes of magnitude 4.0 or greater centered in eastern Garfield County have been recorded (Ward, 1979, figure 1). Faults in this quadrangle and in adjacent quadrangles show no evidence of geologically recent movement. The Calf Creek quadrangle lies in the relatively inactive seismic zone U-1, on a scale of 1 to 4, of the Utah Uniform Building Code (Ward, 1979, figure 3). Earthquakes transmitted from tectonically more active regions, however, may result in rockfalls or sliding of slope deposits.

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