CORRELATION OF MAP UNITS

Middle

Pleistocen

Pleistoce

DESCRIPTION OF MAP UNITS

form thin strath terraces

probably less than 4 m

unknown

Creeks

STREAM DEPOSITS (HOLOCENE AND PLEISTOCENE) --

and terraces. Commonly consist of

Undivided stream and sheetwash alluvium

brown and light-gray silts, sands and

gravels. Consists of locally derived

of these arroyos. Thickness unknown;

Undivided flood-plain alluvium (Holocene) --

Alluvial deposits which form flood plains

moderately to well-rounded and well-sorted

sands and gravels that fill channels and

(Holocene and upper Pleistocene) -- Light-

sheetwash alluvium on side slopes and stream

small alluvial fans which form at the mouths

Light-brown to light-gray, medium to coarse

Beaver and narrow channels inset into older

springs indicate ground-water level is near

the surface of this unit along the Beaver

River. Fills deeply excavated channels

along lower parts of Wildcat and Indian

Creeks and their tributaries. Thickness

Young terrace alluvium (upper Pleistocene)--

coalesced former flood plains of Beaver

River and North Creek near and east of

Beaver. Near Adamsville, 14 km west of

Beaver, this unit forms a terrace 5-6 m

above the modern flood plain of Beaver

River. Also forms terrace 3-5 m above

Indian Creek, Soil contains weak argillic B

horizon but, because of high water table, it

1966). Considered to be glacial outwash and

associated alluvium of the most recent major

glaciation, the Pinedale, which ended about

high quality sand and gravel. Thickness

2-4 m, more along Beaver River and North

Middle terrace alluvium (upper Pleistocene) --

Beaver River near Greenville and 10-13 m

northeast part of the mapped area. Soil

contains moderately developed argillic B

horizon and stage II and III Cca horizons

(Gile and others, 1966). Considered to be

glacial outwash and associated alluvium of

ended about 140,000 years ago. Minor source

gravel. Forms terrace surface 16-18 m above

deformed by normal faults especially west of

Greenville. Soil contains a well-developed,

but locally eroded, thick argillic B horizon

and stage III Cca horizon. Considered to be

glacial outwash and associated alluvium of

Lake, perhaps 200,000 to 250,000 years ago

alluvium--Qtm). Thick deposits below soil

Pleistocene) -- Light-brown to reddish-brown

alluvium is present along an old fault(?)-

Indian Creeks. Older and topographically

higher than old terrace alluvium (Qto).

PEDIMONT SLOPE DEPOSITS (PLEISTOCENE) -- Thin

mantle of alluvium on bajada slopes and

alluvial fan deposits near the mountain

front. Generally more poorly sorted,

thicker accumulations of locally derived

angular, and more variable in lithologic

eastern flank of the Mineral Mountains,

Beaver. These units commonly overlap

silts, sands, and gravels, poorly to

Young piedmont alluvium (upper Pleistocene) --

associated stream alluvium

15 km west of Beaver, and along northern

flank of the Black Mountains, 10 km south of

Light-brown to very slightly reddish brown

moderately sorted. Grades into or overlies

young terrace alluvium (Qty). Soil contains

weak argillic B horizon and stage I to II

undissected surfaces. Thickness commmonly

composition than terrace and flood plain

alluvium. Especially widespread along the

controlled stream valley between Wildcat and

Deposition of unit may not be related to any

above Indian Creek is about 35 m. Thickness

specific climatic event. Projected height

are a major source of high quality sand and

the major glaciation preceding the Bull

(See description of middle terrace

gravel. Thickness commonly 2-10 m

Gravel of Ancestral Indian Creek (middle

sand and gravel, poorly exposed. This

Beaver River near Greenville. Moderately

the Bull Lake Glaciation, which may have

of moderate quality sand and gravel.

Old terrace alluvium (middle Pleistocene) --

Light-brown to reddish-brown sand and

Thickness commonly 2-4 m

above Indian Creek near Manderfield in the

Light-gray to light-reddish-brown sand and

gravel. Forms terrace surface 12-13 m above

12,000 to 15,000 years ago. Major source of

is generally noncalcareous or only weakly

calcareous (stage I of Gile and others,

Light-brown to very slightly reddish brown,

medium to coarse sand and pebbly to bouldery

gravel. Forms broad, slightly elevated and

sand and pebbly to bouldery gravel. Forms

broad, slightly dissected surface west of

deposits upstream. Numerous seeps and

alluvium in small arroyos. Also includes

Pleistocene

Pliocene

Miocene

>TERTLARY

Middle piedmont alluvium (upper Pleistocene)--Light-brown to light-reddish-brown silts, sands, and gravels, poorly to moderately sorted. Grades into or overlies middle terrace alluvium (Qtm). Soil contains moderately developed argillic B horizon and stage II to III Cca horizon. Surface is moderately dissected. Thickness commonly

Old piedmont alluvium (middle Pleistocene) --Light-brown to reddish-brown silts, sands, and gravels, poorly to moderately sorted. Grades into or overlies old terrace alluvium (Oto). Soil contains a well-developed, thick argillic B horizon and stage III Cca horizon. Surface highly dissected; young and middle piedmont alluviums (Qpy, Qpm) deposited in fluvial channels cut into old piedmont surface. Thickness commonly 2-4 m COLLUVIAL DEPOSITS (HOLOCENE AND PLEISTOCENE) --Poorly sorted, gravitationally emplaced deposits of talus, rockfall, slope creep, and landslide debris. Deposits are

generally thin, accumulate in small areas, and in lithologically resemble the units from which they were derived Colluvium (Holocene and upper Pleistocene) --Light-gray to reddish-brown silty sands to sandy gravels. Forms thin mantle of poorly sorted debris on steep slopes of poorly consolidated basin-fill deposits. Commonly

unstable and subject to further movement if

disturbed. Thickness 0-2 m Landslide deposits (Holocene to middle Pleistocene) -- Includes large cuspate rotational slump blocks (toreva blocks) of unbroken to highly fractured basalt adjacent to the basalt of Black Mountain (Qbm)

Qglc GRAVELS OF LAST CHANCE BENCH (MIDDLE

stipple pattern

PLEISTOCENE) -- Light-brown to reddish-brown pebbly sand to sandy gravel. Forms broad, widespread gravel bench resting on a pediment cut across basin-fill deposits. Soil profile contains very well developed, reddish-brown argillic B horizon and (or) well developed stage III to weak stage IV K horizon. (See Gile and others, 1965, for K horizon definition). Basal erosion surface (pediment) on which unit was deposited was cut after drainage from Beaver basin was integrated with that of the Escalante Desert located about 25 km to the west of Beaver. Deposition of this unit preceded accumulation of tuff of Ranch Canyon about 0.55 m.y. ago. These gravels are extensively deformed by middle to late Pleistocene faulting. Thickness 2-5 m; possibly thicker near the mountains and in buried alluvial channels. Unit shown by

Obm BASALT OF BLACK MOUNTAIN (LOWER PLEISTOCENE) --Dark-gray, scoriaceous to massive basaltic lava flow erupted from a source which is probably buried by basalt flows of Crater Knoll, 12 km north of Black Mountain. Flows filled old stream valley of Cunningham Wash, in the northwest part of the mapped area, cior to establishment of through-flow drainage out of the Beaver basin. Natural remnant magnetic direction is weakly reversed with strong normal overprint. K-Ar age is 1.1+0.3 m.y. (Best and others, in press). Thickness 1-6 m; locally more in deep channels

BASIN-FILL DEPOSITS (LOWER? PLEISTOCENE TO

UPPER? MIOCENE) -- Includes six informal units of poorly to moderately consolidated fluvial and lacustrine deposits which comprise two formational rank sedimentary packages, the upper and lower basin-fill deposits. Deposition occurred concurrently with basin development from 9 m.y. ago (or earlier) until drainage from Beaver basin was integrated with the Escalante Desert, 25 km to the west, sometime between 1.1 and 0.5. m.y. ago. The upper basin-fill deposits, younger than the Sevier River Formation (Pliocene and Miocene), are widely exposed in the basin. The lower basin-fill deposits are largely correlative with younger parts of the Sevier River Formation. As mapped the undivided basinfill deposits are poorly exposed, generally coarser grained facies of the upper basin fill (QTsp or QTsf) but may include older units of the lower basin fill in uplifted blocks along the eastern margin of the basin Upper basin-fill deposits (lower? Pleistocene to upper Pliocene) -- Consists of a poorly indurated gradational sequence of

lacustrine, piedmont, and fanglomeratic basin-fill sediments deposited in a closed basin with a shallow but perennial lake Lacustrine deposits-Light- to medium-green silty clays and silts interbedded with well bedded, light-gray to light-brown fine sands grading laterally into pebbly sands. Unit contains four (or more) water-laid tephra, the second highest being the 2.0 m.y. old Huckleberry Ridge ash bed (formerly the Pearlette type B ash; Izett and Wilcox, in press). The tephra, shown by a dotted contact labeled b, is present in lacustrine deposits from near Minersville Reservoir, 10 km southwest of Beaver, to the north side of Black Mountain, in the north part of the mapped area. Top of unit eroded. Minimum thickness is 200-250 m

sequence of interbedded subrounded fluvial channel and deltaic(?) sands and subangular to subrounded pebble to cobble gravels derived from adjacent mountain slopes. Commonly light brown to light reddish brown where oxidized and have zones of abundant manganese cementation. This facies is best exposed from I-15 east to Utah Highway 91 on the north and south sides of Last Chance Bench. Minimum exposed thickness 100 m, base covered

Piedmont facies -- Mountainward coarsening

QTsf Fanglomerate facies -- Uniformly coarsegrained light-reddish-brown sandy subangular pebble to cobble gravels present along the mountain front. Table Grounds, a high-level depositional surface between North Creek and Beaver River, 5 km northeast of Beaver, is the youngest preserved part of the upper basin-fill deposits. Base covered, minimum exposed thickness 100 m. May be considerably thicker along the eastern margin of the basin where sedimentation and tectonism occurred concurrently

OPEN, FILE REPORT SOUTHWEST-QUARTER, BEAVER QUAD., UTAH Lower basin-fill deposits (Pliocene

to upper? Miocene) -- Consists of moderately oxidized and indurated basin-fill deposits; the upper and lower members are fine grained and separated by a coarse-grained conglomeratic member. These deposits reflect sedimentation during more arid and saline (gypsiferous and calcareous) conditions than the upper basin-fill deposits

Upper piedmont dember (Pliocene) -- Lightreddish-brown and light-brown, moderately oxidized sands, sandy conglomerates, and white calcareous marls. Moderately oxidized and indurated throughout; contains calcium carbonate cemented sandstone lenses and discrete calcium carbonate nodules. Consists mainly of piedmont facies but may grade southward in the subsurface into a playa facies. Thickness about 100-150 m

near Black Mountain Conglomerate of Maple Flats (lower? Pliocene) -- Light-brown to light-reddishbrown pebbly sands to boulder conglomerates. Boulders of Tertiary granitic and Paleozoic rocks derived from the Mineral Mountains, about 15 km to the west of Beaver, are as large as 2 m in diameter and mantle the eroded top of the deposit. Unit mainly exposed in uplifted horst in north part of mapped area. Unit represents deposition in response to a phase of major uplift and structural development of the basin. Minimum thickness 250 m; may be 500 m thick in the subsurface Lower piedmont member (lower Pliocene? to

gypsiferous silty clays to pebbly sands. Unit poorly exposed below conglomerate of Maple Flats (Tsmf) in north-central part of map area. Near the abutment of Minersville Reservoir, 20 km west of Beaver, equivalent(?) rocks consist of channelfilling conglomerates with abundant rhyolitic pumice (probably derived from 9-m.y.-old rhyolitic eruptions) indicating that parts of this basal unit may be as old or older than 9 m.y. Thickness unknown; base covered, 75 m exposed

reddish-brown (oxidized) slightly

upper? Miocene) -- Light-brown, brown, and

TUFF OF RANCH CANYON (MIDDLE PLEISTOCENE) --Light-brown, poorly consolidated rhyolitic tuff erupted from volcanoes in the Mineral Mountains (Lipman and others, 1978), 20 km northwest of Beaver. Primary and fluvially reworked air-fall and ash-flow materials fill deeply excavated channels along Cunningham Wash north of the mapped area; elsewhere the unit consists of thin lenses of fluvially deposited silty to sandy pumiceous tuff. Deposition occurred after an outlet from the Beaver basin had been established at Minersville Canyon, located about 20 km west of Beaver, but before the gravels of Last Chance Bench (Qglc) had been deposited. A recent K-Ar age determination on the tuff of Ranch Canyon by G. A. Izett and J. D. Obradovich gave an age of 0.55+0.01 m.y. (G. A. Izett, written commun., 1980)

CONTACT--Approximately located, queried where

gradational FAULT-Dashed where approximately located; dotted where concealed. Bar and ball on downthrown side. Inclination and direction of dip shown where known

__ LINEATION--Possible fault-controlled lineations which appear as faint vegetional or tonal alinements on aerial photographs - ANTIFORM AXIS-Indicates axis of broad,

intensely faulted antiform developed in the lacustrine facies of the upper basin-fill (QTs1), gravels of Last Chance Bench (Qlcg), and old and middle alluviums (Qto and Otm). Growth of the antiform has been concurrent with deposition during (Pliocene(?) and Pleistocene time. Dashed where approximately located, dotted where concealed

HUCKLEBERRY RIDGE ASH BED--Dotted contact, labelled "b", shows main outcrops of this 2.0-m.y.-old water-laid volcanic ash STRIKE AND DIP OF SEDIMENTARY UNITS

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