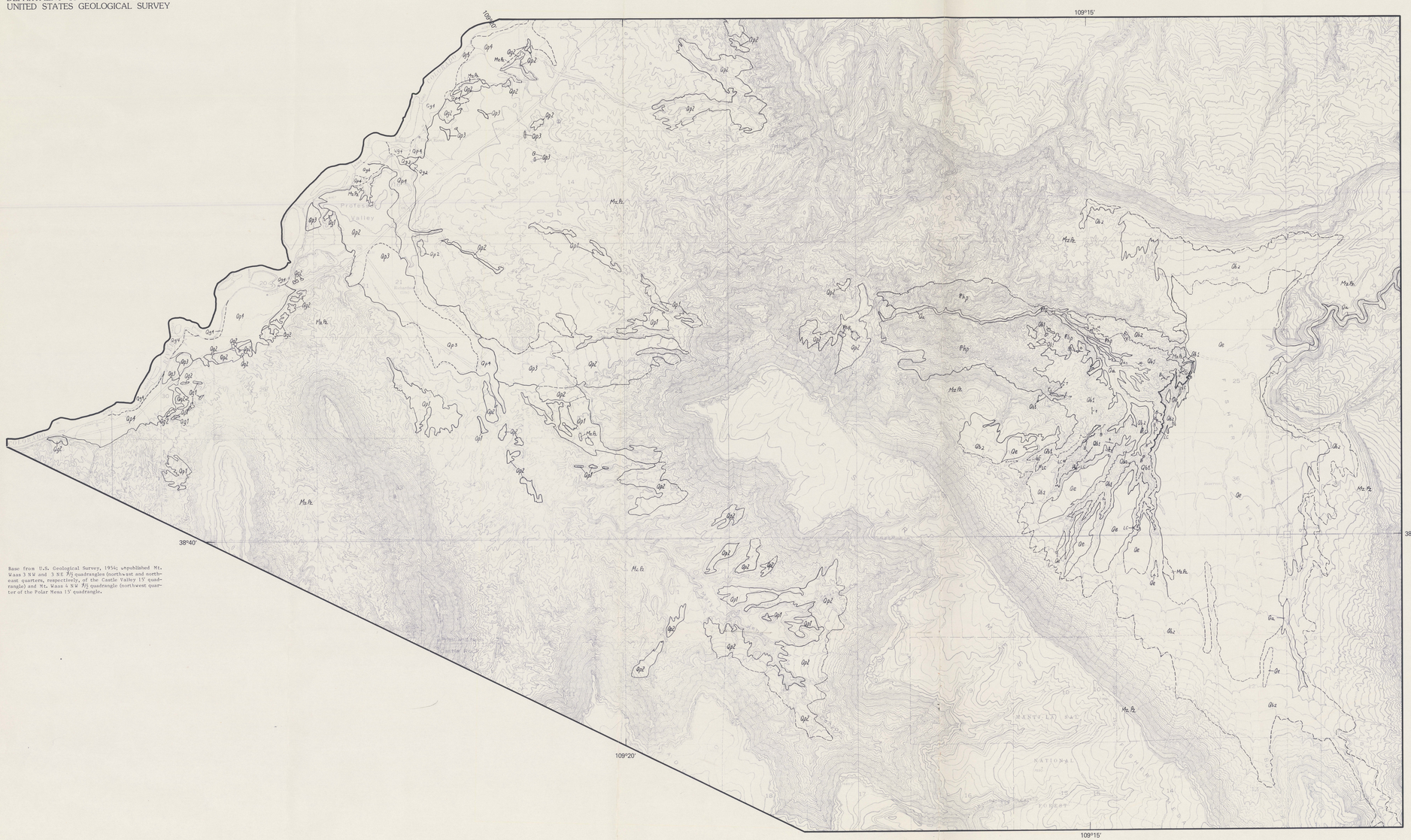
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
83-58



Base from U.S. Geological Survey, 1954; unpublished Mt. Waas 3 NW and 3 SE 7½ quadrangles (eastern and northeast quarters, respectively, of the Castle Valley 15' quadrangle) and Mt. Waas 6 NW 7½ quadrangle (northwest quarter of the Polar Mesa 15' quadrangle.

Geology mapped in 1981-1982.

PRELIMINARY SURFICIAL GEOLOGIC MAP OF THE FISHER VALLEY-PROFESSOR VALLEY AREA, SOUTHEASTERN UTAH

By
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1983

CORRELATION OF MAP UNITS

			Fisher Valley	Professor Valley
	MY	Holocene	Qa : Qe	Qg4 : Qp4
0.01			Qas	
	Quaternary	Pleistocene		Qg3 : Qp3
				Qg2 : Qp2
0.25			Qb2	
0.61			LC	Qg1 : Qp1
0.73			B	
	Tertiary	Pliocene	Qb1	
2.5			Tg	
	Mesozoic			MzPz
	Paleozoic		Php	

EXPLANATION OF MAP UNITS

Units of Late Cenozoic Age, Fisher Valley Area

Qe EOLIAN SAND (HOLOCENE)—Unstratified, reddish-brown, calcareous, nonindurated fine sand and coarse silt; 1-5 m thick. Mantles the floor of Fisher Valley and forms small dunes at the edge of the bluffs near Onion Creek. Contains a very weak soil in its upper part

Qa ALLUVIUM (HOLOCENE)—Thickly to thinly bedded, reddish-brown, calcareous, non- to slightly indurated, fine to coarse sand; variable amounts of subangular to subround gravel; 1-4 m thick. Underlies channels and low terraces along Fisher and Onion Creeks. Contains a very weak soil in its upper part on low terraces

Qas ALLUVIAL SAND (PLEISTOCENE)—Thickly to thinly bedded, yellow to gray, calcareous, nonindurated, silt and fine to coarse sand; as much as 10 m thick. Contains laminated beds with layers of peaty material 1-2 cm thick. Unit occurs about 30 m above stream level on a ridge top near the junction of two forks of Onion Creek, and nearby in patches too small to map. The unit appears to represent a marshy former valley bottom of Onion Creek. A radiocarbon age of 9330 ± 155 yr (DIC-2527) was obtained from peaty sand near the middle of the unit

Qb2 BASIN-FILL SEDIMENTS, UPPER UNIT (PLEISTOCENE)—Toward the center of the depositional basin, the unit is predominantly massive to medium-bedded, reddish-brown, calcareous, moderately indurated sand, with cut-and-fill structures and minor lenses of fine to medium, matrix- and clast-supported, subangular to subround gravel; as much as 50 m thick. Unit locally contains the Lava Creek (LC) ash (0.61 m.y. old; Izett, 1981), as much as 1 m thick, at its base. The basal few meters of the unit also tend to be thinly bedded to laminated, ripple cross-bedded, relatively well-sorted, and ash-rich. Unit appears to contain deposits of several depositional cycles toward the center of the basin, each consisting of thin- to medium-bedded, locally cross-bedded, fluvial sand and gravel, which are overlain by massive eolian sand containing a moderate to well-developed buried soil at its top. Unit is capped by a well-developed calcic soil; preliminary data on rates of accumulation of secondary carbonate in these soils suggest that the uppermost soil is about 0.25 m.y. old. Toward the edges of the depositional basin, the unit thins and is composed predominantly of subangular to subround, moderately indurated, reddish-brown, matrix-supported gravel, with cut-and-fill structures, minor sand lenses, and clasts as much as 1.5 m in diameter. Buried soils are not apparent near the edges of the basin. An angular unconformity separates Qb2 and Qb1 near the edges of the basin; the two units are conformable near the center of the basin. Unit Qb2 also contains at least one angular unconformity near the edges of the basin

Qb1 BASIN-FILL SEDIMENTS, LOWER UNIT (PLEISTOCENE AND PLIOCENE?)—Toward the center of the depositional basin, the unit is composed predominantly of thickly to thinly bedded, fine to coarse, reddish-brown, calcareous sand, interbedded with clast- and matrix-supported, subangular to subround gravel. Moderately to strongly indurated; as much as 100 m thick. The unit contains at least three buried soils and locally contains cut-and-fill structures and cross-bedding. Toward the edges of the basin, the unit is composed predominantly of subangular to subround, matrix-supported gravel with clasts as much as 2 m in diameter and minor lenses of medium to coarse sand; buried soils are not evident near the basin margins. Near the Onion Creek diapir, the unit contains conglomerate beds 1-3 m thick, which grade into moderately indurated gravel away from the diapir. The Bishop (B) ash (0.73 m.y. old; Izett, 1981) occurs about 30 m from the top of the unit. Magnetic polarity of the unit defines a normal-reversed-normal sequence, probably representing the Brunhes, Matuyama, and Gauss epochs (Choquette and Colman, 1983); if so, the base of the unit is more than 2.5 m.y. old. The Brunhes-Matuyama boundary occurs about 5 m below the Bishop ash. Unit contains minor angular unconformities near the edges of the basin

..... VOLCANIC ASH BEDS (PLEISTOCENE)—LC, Lava Creek ash, 0.61 m.y. old; B, Bishop ash, 0.73 m.y. old (Izett, 1981)

Tg GRAVEL (PLIOCENE)—Fine, clast-supported gravel in a matrix of fine to coarse sand with distinct thin to thick bedding. Round to subround clasts mostly less than 10 cm in diameter comprise more than 75 percent of the deposit. Clasts are composed dominantly of intrusive igneous rocks, derived from the La Sal Mountains, and Mesozoic sedimentary rocks. Mostly gray with some streaks of red near top; as much as 25 m thick

Units of Quaternary Age, Professor Valley Area

Qg COLORADO RIVER TERRACE GRAVELS (QUATERNARY)—Round to subround, poorly stratified, clast-supported gravel in a gray, calcareous, sandy matrix; as much as 5 m thick. Clasts are mostly 5-15 cm in diameter with the largest about 30 cm in diameter, and are composed of a wide variety of lithologies, including Precambrian granitic and high-grade metamorphic rocks, Tertiary intermediate-composition extrusive and intrusive igneous rocks, and Mesozoic sedimentary rocks. Deposits underlie terraces and are subdivided according to the height of the terraces above river level and by soil development, as described below:

Qg1 Remnants are about 25-32 m above river level and are mostly eroded. Locally contain a soil with remnants of a strong argillic B horizon and a Cca horizon

Qg2 Remnants are about 12-22 m above river level and locally contain a soil with a moderately to well-developed argillic B horizon and a Cca horizon

Qg3 Remnants are about 5-10 m above river level and contain a soil with moderately developed argillic B and calcic C horizons

Qg4 Deposits are 0-3 m above river level and form the flood plain and lowest terraces. Soil development in these deposits is weak to absent

PEDIMENT, FAN, AND ALLUVIAL DEPOSITS (QUATERNARY)—Locally derived, angular to subangular, matrix-supported gravel in a reddish-brown, calcareous, sandy matrix; locally includes sand deposited by wind and sheetwash. Clasts consist mostly of fragments of Mesozoic sandstone up to 2 m in diameter, but some well-rounded Precambrian clasts, 5-10 cm in diameter, were derived from clasts in the Triassic Cutler Formation. Deposits on pediments that bevel bedrock are 1-3 m thick, but grade into fan deposits, sheetwash, and alluvium as much as 10 m thick near the Colorado River and Professor Creek. Qp1 and Qp2 are locally indurated and stand in cliffs because of $CaCO_3$ cement. Deposits are differentiated by their relation to the Colorado River terrace deposits and their height above stream level, as described below:

Qp1 Graded to and overlies Qg1, about 30 m above drainage near the Colorado River

Qp2 Graded to and overlies Qg2, about 20 m above drainage near the Colorado River

Qp3 Graded to and overlies Qg3, about 10 m above drainage near the Colorado River

Qp4 Graded to and overlies Qg4, about 3 m above drainage near the Colorado River

Paleozoic and Mesozoic Units

Php PARADOX MEMBER OF THE HERMOSA FORMATION (PENNSYLVANIAN)—Expressed at the surface as a chaotic mixture of gypsum, anhydrite, dolomite, black shale, and other residue of the Paradox Member of the Hermosa Formation less soluble than halite. Forms the caprock of the Onion Creek salt diapir

MzPz PALEOZOIC AND MESOZOIC ROCKS YOUNGER THAN THE PARADOX MEMBER OF THE HERMOSA FORMATION—Includes the remainder of the Hermosa Formation, and the Rico, Cutler, Moenkopi, Chinle, Wingate, Kayenta, Navajo, and Entrada Formations. Locally covered by 0-2 m of eolian sand in the Professor Valley area, and by talus at the base of cliffs

Contact; dashed where gradational or approximately located

10 Strike and dip of bedding

NOTE

This map was constructed to document the distribution and character of the late Cenozoic deposits in the Fisher Valley-Professor Valley area. The map area includes the central portion of one of the long northwest-trending salt-cored anticlines of the Paradox Basin. The map area contains Fisher Valley, formed by collapse of a portion of the crest of the anticline, and the Onion Creek salt diapir, a cupola of salt on the main diapiric salt mass.

Previous mapping in the area includes Dane's (1935) reconnaissance work, Williams' (1964) map of the Moab 1x2° quadrangle, and Shoemaker's (1952, 1954) work in the Fisher Valley area. Richmond (1962) mapped the surficial deposits along the Colorado River in the southwest part of the map area, as well as in the adjacent Castle Valley and La Sal Mountains areas.

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