GEOLOGIC MAP OF THE LATIMER QUADRANGLE IRON COUNTY, UTAH

by

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DESCRIPTION OF MAP UNITS

Qal **Alluvial deposits of intermittent stream channels and floodplains (Holocene)**--In the northwest corner of the quadrangle these deposits, in an intermittent stream channel with a drop of more than 50 feet per mile, are poorly sorted sand, gravel, and boulder deposits. However, the more extensive Qal deposit that extends from Mud Spring Wash in the southeast corner to the northern edge of the map follows a drainageway of almost no relief and the sediments on this bottomland are pinkish-gray clayey silt that was deposited by meandering streams entering into playa lakes. The meander scars of these valleybottom streams can be seen best on aerial photographs; they are almost imperceptible on the ground. The Mud Spring Wash stream system was likely active during the Ice Ages when more water reached the Escalante Desert from the High Plateaus east of Cedar City. Mower (1982, plate 4) presented a log of well 5106 in sec. 9, T 32 S, R 13 W. This well penetrated 310 feet of valley fill and encountered mostly sand, gravel, and boulders with three clayey horizons each more than 10 feet thick at depths of 30, 200, and 280 feet. Thus it would appear that the fine-grained clayey silt at the surface is not typical of earlier Quaternary deposition in this desert flatland.

Qaf_1 **Alluvial fan deposits of the latest generation (Holocene)**--Unconsolidated mud, sand, gravel, and boulder deposits; 80 percent sand and grit size, 20 percent larger clasts up to a foot. Mostly developed where stream channel gradients flatten as they enter the Escalante Desert lowland. Late Quaternary fault scarps cut one of these fans.

Qaf_2 **Alluvial fan deposits of intermediate age (Holocene to Pleistocene)**--Unconsolidated mud, sand, gravel and boulder deposits along the west side of the Escalante Desert. The largest fan extends southeastward from the mouth of Fishers Wash west of the northwest corner of the map. The Lake Bonneville shoreline is so indistinct along the toe of this fan that the age of Qaf_2 relative to the 15,000-year-old Bonneville Shoreline was not determined. Surface of these fans is cut by small rills but only the modern drainage from Fishers Wash has cut significantly into these fan deposits.

Qe **Eolian deposits, undivided (Quaternary)**--Mostly silt to fine sand deposits that have been blown across the Escalante Desert floor in a northeasterly direction. Mostly formed into low, poorly organized longitudinal dunes. Eolian material constitutes a fair portion of all deposits in the Escalante Desert having accumulated concurrently with alluvial and lacustrine deposits throughout late Quaternary time activated by persistent winds blowing out of the Mojave Desert in California and Nevada.

Qea **Mixed eolian and alluvial deposits (Quaternary)**--Dune sand with significant component of alluvial pebbles and grit.

Qeb **Blowouts (Quaternary)**--Small eolian deflation depressions in the floor of the Escalante Desert intimately associated with adjacent dune deposits.

Qed **Eolian dunes (Quaternary)**--Sand and silt deposits having well-developed dune morphology either as barchans or as longitudinal dunes. Maximum thickness 20 feet.

Qat_1 **Younger terrace deposits (Quaternary)**--Clayey, silty, sandy, and pea gravel alluvial deposits slightly above the clayey alluvial floodplain bottom of Mud Spring Wash. Probably formed during Pleistocene; now being modified by eolian processes.

Qat_2 **Older terrace deposits (Quaternary)**--Highest alluvial terrace on the north bank of Mud Spring Wash; composed of silty, sandy, and pea gravel deposits just below widespread surface of QTa deposits into which Mud Spring Wash has cut.

Qlu **Undifferentiated lacustrine deposits (Quaternary)**--This unit is mapped only below the elevation of 5090 feet, the likely highstand of Lake Bonneville in the Lund area between 16,000-14,500 years ago. Lake Bonneville deposits are poorly known in this quadrangle because they are covered by later eolian and playa deposits.

Qll **Lacustrine lagoonal deposits (Quaternary)**--A Lake Bonneville gravel bar on the west side of Blue Knoll caused a small lagoon to be formed in the cove east of it. The lagoonal deposits are fine sand, silt and clay and cannot be more than a few feet thick because Lake Bonneville was at its highstand only a short time between 16,000 and 14,500 years ago (Currey, Atwood, and Mabey, 1983).

Qlg **Lake Bonneville gravel (Quaternary)**--A bar and spit can be traced for more than a mile around the west foot of Blue Knoll. Currey (1982) regarded it as the best record of the highstand of Lake Bonneville preserved in the quadrangle. The elevation of the top of the bar has been traced elsewhere throughout the quadrangle, but Bonneville shore features, probably never strongly marked because of the limited duration of the lake as noted above, have been almost entirely obliterated by eolian and alluvial processes. The Blue Knoll bar is composed of 80 percent sand and 20 percent pea gravel and is about 10 feet thick.

QTa **Alluvium (Quaternary-Pliocene?)**--This unit covers nearly two-thirds of the quadrangle. It consists of alluvial deposits which are largely covered by eolian sand and silt. A profile of this alluvium is best exposed in two locations on the northeast side of the Mud Spring Wash valley. In the northeast quarter of Sec. 11, T 32 S, R 13 W east of Qeb, and also in the southwest quarter of Sec. 34, T 31 S, R 13 W east of Qal and north of a corral along the section-line road, about 8 feet of section is exposed. The lowest 3-4 feet is pinkish gray sandy silt with about 20 percent pea gravel clasts of volcanic rock; the middle 2-3 feet is light-gray slightly clayey soil which shows up as a white band on aerial photos, and is regarded as a poorly developed caliche by Dr. C.G. Oviatt who examined these sites in June 1987; the top 2-3 feet consists of sandy silt with 20 percent pea gravel pebbles of volcanic rock and some flint fragments. An Indian arrowhead collected at the last site was distinctively enough shaped so that Prof. Dale Berge of Brigham Young University estimated that it could be as old as 3000 years. The few Indian points and flakes found at the site suggest that there was water in the Mud Springs lowland and that the Indians had temporary hunting sites on the adjacent higher ground.

QTal **Alluvial channel fill (Quaternary-Pliocene?)**--Along the east-central edge of the quadrangle a low ridge more than two miles long probably represents inverted topography following the course of stream channel at the top of QTa deposits. The QTal is made of silt, sand, and grit with 10 percent or more angular clasts of volcanic rock ranging up to 1 inch across. These larger clasts serve as the armor that protects this ancient stream channel deposit from being lowered by eolian deflation as much as the adjacent QTa surface. This low ridge shows up particularly well on aerial photographs. The channel deposit is up to 10 feet thick.

Tsb **Basalt member of the Steamboat Mountain Formation (Miocene)**--Dark-to medium-gray, commonly vesicular, weakly porphyritic, with olivene and plagioclase phenocrysts. Composition ranges from mugearite to trachyandesite in areas north and west of this quadrangle where ages of 13 to 11 m.y. have been obtained (Best et al., 1987). In the adjacent Thermo quadrangle Rowley, (1978) mapped basalt flows for which Best et al. (1980) obtained a whole rock age of 10 m.y. Insufficient exposures preclude accurate thickness measurement of this unit here but it is probably less than 100 feet thick.

Thm **Mafic member of the Horse Valley Formation (Miocene)**--Soft to resistant dark gray dacitic or andesitic mudflow breccia exposed at the base of Blue Knoll and nearby. Much more extensively exposed in the adjacent Thermo quadrangle where it was named and described by Rowley (1978). About 150 feet thick where exposed around the base of Blue Knoll, but Rowley reported a thickness of more than 1800 feet in the adjacent Thermo quadrangle.

STRUCTURE

Structural deformation is not much in evidence in the Latimer quadrangle. Miocene volcanic rocks on Blue Knoll are nearly flat-lying, and none of the late Tertiary-Quaternary alluvial units are deformed except by the small fault scarps that cut alluvial fan deposits on the west side of the quadrangle. Anderson and Bucknam (1979) briefly discussed faults that cut unconsolidated sediments near Lund and these small scarps in this quadrangle are part of this fault system. Erosion of the scarps has so flattened their profile that it is believed the scarps are at least several thousand years old. It is likely that other basin-range faults are concealed beneath the surface deposits of the quadrangle, but no geophysical studies are available to the authors to tell where they might be.

ECONOMIC GEOLOGY

At present there is no exploitation of geologic resources in this quadrangle and the likelihood for future development is not great. In the early part of the century when the railroad steam engines required frequent watering stations the Latimer site was inhabited. It was abandoned when diesel locomotives were introduced. Remnants of a small brick-making furnace operated by J.B. Latimer and Company can be found a tenth of a mile east of Blue Knoll well in Sec. 23, T 31 S, R 13 W. Gravelly sand deposits suitable for road building could likely be developed within QTa deposits but no excavations deep enough to show this are now available in the quadrangle.

GEOLOGIC HAZARDS

Inasmuch as the quadrangle is uninhabited and but little developed, potential for damage is restricted to the railroad and graded gravel roads. Chief hazards would be sheetwash flooding of low areas which might occur every few years as a result of cloudbursts, or the much less frequent possible damage to the railroad from an earthquake. This quadrangle is on the western edge of the Intermountain Seismic Belt (Stover, Reagor, and Algermissen, 1986); the interval between damaging earthquakes in this area is thousands of years.

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Quaternary mapping by Hintze, igneous rocks identified by Best

LATIMER QUADRANGLE
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7.5 MINUTE SERIES (TOPOGRAPHIC)

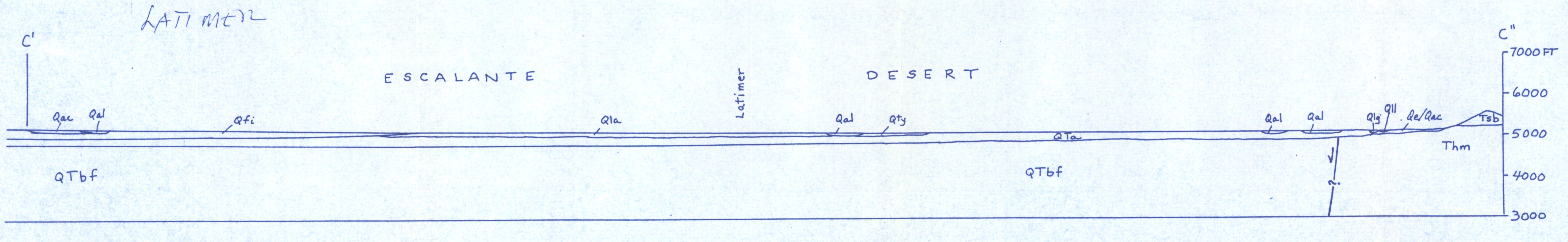
Map units

Qal	Alluvium
Qaf1	Young fan deposits
Qaf2	Older fan deposits
Qac	Alluvium & colluvium
Qat1	Younger terrace deposits
Qat2	Older terrace deposits
Qe	Eolian deposits
Qea	Eolian and alluvial deposits
Qeb	Eolian blowout
Qed	Eolian dune
Qlg	Bonneville gravel
Qll	Lacustrine lagoon
QTa	Older alluvium
QTal	Older alluvial channel inverted topography
Tsb	Steamboat Mountain Basalt
Thm	Mafic rocks of Horse Valley

--B-- Bonneville shoreline
dotted = obliterated
dashed = approximate

Qe/QTa indicates thin cover of Qe over QTa

LATIMER



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