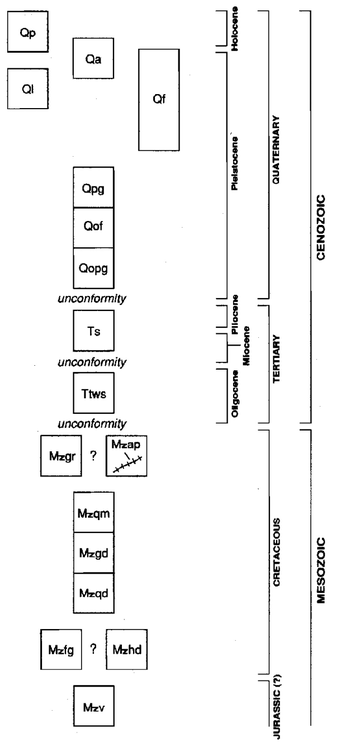

Qp **Playa deposits.** Light-brown, moderately well-sorted, slightly sandy silt and clay. Flat playa areas surrounded by **Ql** are found at the low point in southern Antelope Valley, and at a slightly higher elevation behind **Ql** beach bar deposits 1.5 km to the north.

Qa **Alluvial-plain and undifferentiated alluvial deposits.** Unconsolidated sand and gravelly sand, predominantly arkosic. Sheetwash, sidestream, and wash alluvium in predominantly Holocene to modern channels or as broad, low-gradient alluvial plains.

Ql **Lake deposits.** Lacustrine silt and clay, and beach bar and forebeach deposits of fine to coarse sand. Deposited in a small late Pleistocene lake in Antelope Valley (Cordy, 1985).

Qf **Alluvial-fan deposits.** Very poorly to moderately sorted cobbly and pebbly sand, unconsolidated to partially consolidated and predominantly arkosic. Consists of relatively undissected fan surfaces which slope toward upland source areas.

Qpg **Pediment deposits.** Thin deposits of bouldery and pebbly, unconsolidated gravel. The clasts consist of Mesozoic metamorphic rocks, granitic rocks, and aplite. Unit **Qpg** occurs as dissected remnants overlying unit **Ts** west of Freds Mountain and east of Hungry Mountain.

Qof **Older alluvial-fan deposits.** Alluvial fans with moderately to deeply incised surfaces; consisting of semiconsolidated pebbly to bouldery sand. Much of the unit consists of arkosic clastic material derived from granitic rocks. Debris-avalanche material, consisting in part of large granitic boulders, is interpreted to occur locally within the unit east of Dogskin Mountain.

Qopg **Older pediment deposits.** Light-tan to brown, highly dissected, poorly consolidated pediment deposits consisting of muddy sand, coarse sand, pebbly sand, and gravel. Locally contains cobbles of **Ttws** and milky vein quartz, which form as a lag on outcrop surfaces. Overlies unit **Ts** on the northeast flank of Freds Mountain.

Ts **Tertiary sedimentary rocks.** Lacustrine and fluvial conglomerate, sandstone, and tuffaceous siltstone and shale. Predominately white to light gray and commonly poorly exposed. Thin-bedded to massive arkosic sandstone makes up a major part of the unit in some areas. May be covered with a thin lag gravel of unit **Qpg.**

Ttws **Tuffs of Whiskey Spring.** The tuffs of Whiskey Spring are white to light-gray and pale-red rhyolitic vitric to crystal-vitric tuffs, slightly to highly welded, with phenocrysts which are 45-65% sanidine, 35-45% plagioclase, 1-5% quartz, and a trace to 2% biotite. Pumice is present, but is generally not obvious in most samples. Lithic content is variable. The tuffs often weather and erode along closely spaced polygonal fractures that develop on weathered surfaces. The "nubbly"-weathering character of this surface and the platy- or hackly-fracturing nature of the sanidine phenocrysts serve as unique field identification characteristics.

H. F. Bonham, Jr. (written commun., 1980) has subdivided the tuffs of Whiskey Spring into, from top to bottom, the tuff of Paiute Creek, an unnamed tuff, and the tuff of Rattlesnake Canyon (which has been K-Ar dated at 28.6 Ma). The tuffs of Whiskey Spring are equivalent to the tuffs of Seven Lakes Mountain of Deino (1985), who divided them into the following informal tuff units, from top to bottom, the Harry's Spring, Long Valley, Constantino, and Zamboni. These range in age from about 29 to 31 Ma. The tuffs of Whiskey Spring are the oldest of the Tertiary ignimbrites in this part of western Nevada, and commonly lie directly on pre-Tertiary basement rocks. They are equivalent to the tuffs of McKisnick Springs of Hutton (1978) and Seidl (1982).

Mzap **Aplite and pegmatite dikes.** Long, commonly 1-2 m wide, high-angle aplite or aplite/pegmatite dikes, consisting predominantly of quartz and alkali feldspar. Light gray to pink; dikes commonly form long, narrow, linear ridges [illegible] **Mzqm** and **Mzgd** (and **Mzqd** on Peterson Mountain to the west of the quadrangle; Garside, 1987), but are much more common in **Mzqm,** and may be related to that phase of magmatism. Most of the dikes occur in a northerly striking swarm on the west flank of Warm Springs Mountain.

Mzgr **Biotite granite.** White to pinkish-gray, coarse-grained granite containing approximately equal amounts of plagioclase, microcline, and quartz, with sparse brown biotite and rare garnet up to 1 mm in diameter.

Mzqm **Quartz monzonite of Granite Peak.** Light-gray biotite-hornblende quartz monzonite; hypidiomorphic-granular, medium grained and sphene bearing. Locally grades to granodiorite in composition. Felsic phases are deeply weathered to grus containing numerous 5-mm quartz grains. Probably Cretaceous, believed to intrude **Mzqd** and **Mzgd** (Garside, 1987).

Mzgd **Granodiorite of Golden Valley.** Gray hornblende-biotite granodiorite, equigranular to porphyritic, medium grained. Named for granodiorite outcrops in the vicinity of Golden Valley as described by Bonham and Bingler (1973) and Cordy (1985). Resistant to weathering, forming blocky to spheroidal corestone outcrops surrounded by grus. On Hungry Mountain, locally contains dark-greenish-gray, cognate inclusions of microphaneritic granodiorite porphyry. Probably part of a Cretaceous pluton dated at 91 Ma west of Peavine Peak, 25 km to the southwest (Bell and Garside, 1987). Stipple pattern denotes areas of greisen-like alteration (consisting of quartz, muscovite, and rutile) in the vicinity of titanium prospects (also see Beal, 1963, p. 25). Muscovite from the eastern altered area was K-Ar dated at 86.7±0.03 Ma (pers. commun., E. H. McKee, 1990).

Mzqd **Quartz diorite of Peterson Mountain.** Massive medium- to coarse-grained pluton of dark-gray hornblende-biotite quartz diorite. High color index; weathers to rounded, knobby outcrops. Based on field relations, the unit is believed to be the oldest of a comagmatic group of plutons which become more mafic with age. A sample from the east flank of Peterson Mountain in the Reno NW Quadrangle was K-Ar dated at 89.5±3.0 Ma on biotite (pers. commun., E. H. McKee, 1990).

Mzfg **Foliated granodiorite.** Medium-light-gray to medium-gray, medium-grained, hornblende-biotite granodiorite having a prominent alignment of mafic minerals as individual crystals and as clots and concentrations on a scale of centimeters. On Freds Mountain, occurs along the south margin of the **Mzv** pendant in an elongate band parallel to the pendant and having foliation subparallel to the contact and the band outcrop. Believed to be intruded by **Mzqd.**

Mzhd **Hornblende diorite.** Medium- to dark-gray, medium- to fine-grained rock consisting of white plagioclase and elongate to acicular black hornblende in approximately equal proportions. Sphene is a common accessory mineral. Local phases noted near the radio facility on Warm Springs Mountain have a color index near 90 and hornblende phenocrysts up to 0.5 by 6 cm. Occurs as pendants and inclusions in **Mzqm.**

Mzv **Peavine sequence.** Dark-gray meta-andesite, predominantly metamorphosed to biotite hornfels and schist. Original porphyritic textures of the protolith andesitic volcanic rocks are locally preserved. Foliation, as defined by recrystallized biotite, is high angle and better developed near intrusive contacts with **Mzfg** and **Mzgd.**

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MAP SYMBOLS

Contact Dashed where approximately located, queried where uncertain.

Fault Dashed where approximately located, dotted where concealed; ball on downthrown side.

Strike and dip of bedding

Strike and dip of primary foliation

Strike and dip of compaction foliation

Greisen-like alteration

Aplite and pegmatite dikes (Mzap)

Scale 1:24,000

CONTOUR INTERVAL 10 METERS

0 0.5 1 KILOMETER
0 1000 METERS

0 0.5 1 MILE
0 2000 4000 FEET

GEOLOGIC MAP OF THE BEDELL FLAT QUADRANGLE, NEVADA

Larry J. Garside

1993

Base map: U.S. Geological Survey Bedell Flat 7.5' Quadrangle, 1980.

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