82-115

EXPLANATION

	Qs	YOUNGER ALLUVIUM—Sand and gravel of local origin, pale-brown to grayish-brown; stream, fan, and sheet deposits. Generally drained of water but near Lake Mohave and Opal Mountain may yield as much as 500 gallons per minute to shallow wells
PLEISTOCENE	Qc	CHEMEHUEVI FORMATION—Silty sand, gravel, cobbles, and boulders, light-brown, tan, and reddish-brown, poorly sorted, subangular, weakly cemented. Clasts consist mainly of intermediate to mafic volcanic rocks from nearby mountains; generally lighter colored and gypsiferous southwest of the mouth of Las Vegas Wash. Near Lake Mohave south of Lonesome Wash, the unit consists of scattered deposits of weakly cemented silt, clay, sand, gravel, and cobbles, tan to light-gray; the gravel and cobbles are subangular volcanic clasts, which are locally derived exotic rounded clasts of quartzite, granite, limestone, chert, and jasper. The unit is drained of water in most of the area but may yield as much as 200 gallons per minute to shallow wells northwest of Saddle Island, where the unit is saturated by water from Lake Mead. South of Lonesome Wash, the unit could yield as much as 1,000 gallons per minute of water to wells if the unit is saturated by water from Lake Mohave
QUATERNARY		
UPPER TERTIARY AND LOWER QUATERNARY	QTol	OLDER ALLUVIUM—Mainly sand, gravel, cobbles, and boulders; locally includes silt, clay, and conglomerate. The unit is dominantly light grayish brown and weakly to moderately cemented. The silt and clay are light reddish brown, brown, and tan and are weakly consolidated. The conglomerate is light grayish brown and moderately to well cemented. The sand, gravel, cobbles, boulders, and conglomerate are poorly to moderately sorted, and boulders are as much as 2 feet in diameter; bedding may be well defined, and crossbedded sand is present in many places. South of Eldorado Canyon, the unit forms dissected alluvial fans and contains subangular clasts of granitic and volcanic rocks derived from the nearby mountains. Near Lake Mohave and Las Vegas Wash, the unit is as much as 30 percent rounded clasts of granite, limestone, quartzite, chert, and jasper of distant origin and is in well-defined river channels cut into older rocks. The weakly to moderately cemented sand, gravel, cobbles, and boulders unconformably overlie the well-cemented conglomerate or older rocks. The silt and clay are near Lake Mohave between Aztec Wash and Opal Mountain and near the mouth of Las Vegas Wash; in places the silt and clay are interbedded with rounded gravel and in other places contain thin beds of white gypsum or scattered gypsum crystals. South of Aztec Wash, the silt and clay are well laminated. Near Lakes Mead and Mohave, the sand, gravel, cobbles, and boulders may yield 500 gallons per minute of water to wells; the silt and clay probably will yield less than 10 gallons per minute. Elsewhere, the unit probably is drained of water
TERTIARY AND QUATERNARY		
MIOCENE AND PLIOCENE	Tcf / Tcc / Tcm	MUDDY CREEK FORMATION—Divided into the conglomerate facies (Tcc), the mudstone facies (Tcm), and the Fortification Basalt Member (Tcf). The conglomerate facies comprises sand, gravel, cobbles, and boulders moderately to well cemented by calcite. The facies contains poorly sorted subangular mostly volcanic-rock detritus set in a silty matrix that is light reddish brown, reddish brown, grayish reddish brown, brown, and tan. Near Lake Mohave south of Eldorado Canyon and near Lake Mead between Saddle Island and Las Vegas Wash, the conglomerate facies consists of an upper part and a lower part separated by an unconformity. The upper part generally is grayish reddish brown, brown, or tan and tends to form cliffs; the lower part is dark reddish brown and tends to form rounded slopes. The mudstone facies is light-reddish-brown silty sandstone to mudstone and includes white to gray tuff, gypsum, and gypsiferous mudstone. Tuff beds are as much as 2 feet thick. Southeast of Boulder City, the mudstone includes about 60 feet of dark-gray manganiferous silty gypsum. Small amounts of manganiferous material are present elsewhere in the facies. The Fortification Basalt Member consists of dark-gray to black dense to vesicular olivine basalt flows. The conglomerate facies may yield as much as 10 gallons per minute of water to wells near Lake Mohave. The mudstone facies is nearly impermeable in most of the area. Near Lake Mead, wells may yield less than 1 gallon per minute of poor-quality water. The Fortification Basalt Member is drained of water and is of little hydrologic significance
TERTIARY	Tv	VOLCANIC ROCKS—Basaltic to rhyolitic lava flows, monolithologic flow breccia, tuff, welded tuff, and interbedded clastic rocks. Rocks commonly are chemically altered, sheared, fractured, and faulted. Springs discharge as much as 500 gallons per minute of water from faults and fractures along the Colorado River south of Hoover Dam. Elsewhere, springs discharge less than 1 gallon per minute. Near Lakes Mead and Mohave, wells may yield as much as 10 gallons per minute
PRECAMBRIAN AND TERTIARY	Tp€r	METAMORPHIC AND PLUTONIC ROCKS—Gneiss, schist, and granitic pegmatite of Precambrian age and intrusive granitic rocks and rhyolitic to basaltic dikes of Tertiary age; in many places the rocks are altered, fractured, faulted, sheared, and brecciated. Springs discharge as much as 500 gallons per minute of water from exposed fractures and faults along the Colorado River south of Hoover Dam. In the southern part of the Eldorado Mountains sheared and faulted schist, gneiss, and granitic rocks may yield less than 5 gallons per minute of water to springs, wells, and mine shafts

GEOLOGIC CONTACT—Long dashed where approximate; short dashed where inferred or gradational

FAULT—High-angle fault, showing direction and dip where known; dashed where approximately located; dotted where concealed; bar and ball on downthrown side; arrow indicates relative horizontal movement on transverse fault

SYNCLINE—Showing approximate trace of trough plane and direction of plunge

STRIKE AND DIP OF BEDS AND FOLIATION

DIRECTION OF SEDIMENT TRANSPORT—Arrow indicates direction of streamflow; based on imbrication and (or) crossbedding

WELL—C indicates chemical analysis of water shown in table 2

SPRING—Number, 172, is discharge in gallons per minute. C indicates chemical analysis of water shown in table 2. Data for springs on the side of the Colorado River in Arizona are from Bentley (1979c)

① FAVORABLE SITE FOR FUTURE GROUND-WATER DEVELOPMENT

BASE FROM U.S. GEOLOGICAL SURVEY HENDERSON, 1952; HOOVER DAM, 1953; BOULDER CITY, 1958; NELSON, 1958; AND MOUNT PERKINS, 1959

SCALE 1:62500

CONTOUR INTERVAL 80 FEET
DOTTED LINES REPRESENT 40-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

GEOLOGY BY R. L. LANEY, 1976, AND MODIFIED FROM LONGWELL (1963)
GEOLOGY BETWEEN HENDERSON MARSH AND ELDORADO CANYON BY R. L. LANEY, 1976, AND MODIFIED FROM ANDERSON (1969, 1971, 1977, 1978)

Figure 2.--Reconnaissance geologic map, Lake Mead National Recreation Area--Las Vegas Wash to Opal Mountain, Nevada.

Scale 1:62,500