



**CORRELATION OF MAP UNITS**

Qh <sub>2</sub>	Holocene	QUATERNARY
Qh <sub>1</sub>		
Qp	Pleistocene	QUATERNARY AND OLDER
b		

**DESCRIPTION OF MAP UNITS**

Qh<sub>2</sub> YOUNGER HOLOCENE ALLUVIAL DEPOSITS—Indissected to slightly dissected surfaces. Pedogenic-soil development ranges from none to weak; the most well developed soils have A horizons and thin C<sub>h</sub> horizons. Geomorphologic and soil evidence suggests that these materials were deposited within approximately the last 500 to 1,000 years.

Qh<sub>1</sub> OLDER HOLOCENE ALLUVIAL DEPOSITS—Moderately dissected surfaces. Pedogenic-soil development ranges from soils with A horizons and thin C<sub>h</sub> horizons to soils with A<sub>1</sub> weak argillite, and C<sub>h</sub> horizons. Geomorphologic and soil evidence suggests that these materials were deposited between approximately 500 to 1,000 years ago and 10,000 years ago, although deposits as old as 15,000 years may be included.

Qp LATE TO MID PLEISTOCENE ALLUVIAL DEPOSITS—Well dissected surfaces having original depositional morphology progressively destroyed with increasing age. Pedogenic soils may or may not have an A horizon, but typically have a moderate to well developed argillite horizon and an underlying C<sub>h</sub> horizon. Geomorphologic and soil evidence suggests that these materials were deposited during the last half of the Pleistocene (between approximately 10,000 to 15,000 years ago and 750,000 years ago).

Qls LANDSLIDE DEPOSITS—Includes displaced landslide deposits as well as head-scarp and flank-scarp areas.

b BEDROCK AND UNDIFFERENTIATED SURFICIAL DEPOSITS—Consolidated sedimentary materials of Quaternary age and older, and metamorphic and granitic basement rocks. Locally includes weakly consolidated sedimentary materials and landslide deposits.

**EXPLANATION**

— GEOLOGIC CONTACT

— FAULT—Dotted where concealed, dashed where approximately located. Arrows indicate direction of relative movement; bar and ball on downdropped block. Hashes indicate fault scarp, with hashes on downdropped block.

— THRUST FAULT—Teeth on upper plate.

— 50 —— CONTOUR LINE SHOWING MINIMUM DEPTH TO GROUND WATER DURING 1973-1983 PERIOD—Hashed where location uncertain; depth in feet below land surface.

• APPROXIMATE LOCATION OF SUBSURFACE-BORING SITES HAVING STANDARD PENETRATION TESTS (SPT) USED IN THIS INVESTIGATION—Each dot represents the approximate center of a site having one or more borings. The size and shape of sites vary from location to location, and individual SPTs at a site may have been completed anywhere up to 0.75 miles from the location indicated.

— 4 mi ——— LINE OF EQUAL DISTANCE FROM THE SAN ANDREAS FAULT

**REGIONAL SUSCEPTIBILITY RATINGS**

Regional liquefaction-susceptibility ratings are assigned to populations of susceptibility determinations that are grouped according to ground-water depth, distance to causative fault, and geologic unit (tables 1 through 7; see text for discussion). The ratings are based on the percentage of SPT determinations that indicate susceptible conditions: HIGH, >40 percent; MODERATELY HIGH, 60 to 80 percent; MODERATE, 30 to 60 percent; LOW, <30 percent. Both single ratings (for example, HIGH) and compound ratings (for example, MODERATELY HIGH TO MODERATE) are used. Compound ratings typically are applied to the 20-ft ground-water intervals at 10-to-30 ft and 30-to-50 ft subsurface. For these 20-ft intervals, the first part of the compound rating applies to the shallower 10-ft interval while the second rating applies to the deeper 10-ft interval.

**LIMITATIONS**

This map is subject to the limitations described in the accompanying text. The map identifies generalized regional patterns of liquefaction susceptibility rather than local conditions, and therefore cannot be used to determine the degree of liquefaction susceptibility at specific sites. Moreover, the map only addresses liquefaction susceptibility; the level of hazard created by liquefaction-induced ground failures is not addressed. The boundaries between susceptibility zones will shift as ground-water conditions change.

**LEGEND**

[Pattern]	HIGH SUSCEPTIBILITY
[Pattern]	MODERATELY HIGH TO MODERATE SUSCEPTIBILITY
[Pattern]	MODERATE SUSCEPTIBILITY

# LIQUEFACTION SUSCEPTIBILITY MAP OF THE SAN BERNARDINO VALLEY AND VICINITY FOR AN M<sub>S</sub>=8.0 EARTHQUAKE ON THE SAN ANDREAS FAULT

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Geology compiled from published and unpublished 1:24,000-scale geologic quadrangle maps as follows: the Devore quadrangle (D.M. Morton and J.C. Matti, unpublished mapping, 1975-1986); the San Bernardino North quadrangle (Miller, 1979); S.E. Carson and J.C. Matti, unpublished mapping, 1980-1986; the Harrison Mtn. quadrangle (S.E. Carson and J.C. Matti, unpublished mapping, 1980-1986); the San Bernardino South quadrangle (Morton, 1978a; J.C. Matti and S.E. Carson, unpublished mapping, 1980-1986); the Redlands quadrangle (Morton, 1978b; J.C. Matti and S.E. Carson, unpublished mapping, 1980-1986); the Yucaipa quadrangle (J.C. Matti, D.M. Morton, S.E. Cox, S.E. Carson, and T.J. Yetter, unpublished mapping, 1975-1986); the Sunnymead quadrangle (Morton, 1978c); and the El Cusco quadrangle (J.C. Matti and D.M. Morton, unpublished mapping, 1975-1986).

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.