



Qg
Qf Qa Qls
Surficial deposits
Qg, stream gravel and sand
Qf, alluvial fan gravel
Qa, alluvium (gravel, sand and clay)
Qls, landslide debris

Qoa
Older alluvium
UNCONFORMITY

Qsc
Santa Clara Formation (valley sediments, gravel and clay)
UNCONFORMITY

a
Andesitic rock

Tbr
Briones Sandstone (marine, Upper Miocene)

Tm
Tmd
Tma
Monterey Shale (Claremont Shale Member)
Tm, siliceous shale
Tma, clay shale
UNCONFORMITY

Kshu **Kssu**
Ksh **Kcgo**
Kshl
Marine sedimentary rocks
Ksh, micaceous shale, undivided
Kshu and Kssu, Berryessa Form. of Crittenden, 1950
Kshu, shale
Kssu, sandstone
Kcgo, Oakland conglomerate of Crittenden, 1950
Kshl, Knoxville Formation of Crittenden, 1950
Kshl, Knoxville Formation of Crittenden, 1950, micac. shale

sp
Serpentine

fs fg fc f gl
Franciscan rocks
fs, sandstone (graywacke) and micac. phyllitic shale
fg, greenstone
fc, chert
f, mixed rocks, mostly graywacke and shale
gl, glauconitic sandstone

Contact
dashed where gradational or approximately located

Fault
dashed where inferred; dotted where concealed;
U—upthrown block
D—downthrown block, relatively;
single arrow indicates observed dip of fault; double parallel arrows indicate lateral movement

30° X
inclined vertical
70° X
overturned

Strike and dip of bedding

↗ ↘
anticline syncline

↗ ↘
Axis of fold
end arrow indicates direction of plunge

●
molluscan
Fossil localities

Mapped, edited, and published by the Geological Survey
Controlled by USGS, USC&GS, and USCE
Topography from aerial photographs by multiple methods
Aerial photographs taken 1953. Field check 1954-55
Polyconic projection. 1927 North American datum
U.S. 1-foot grid based on California coordinate system, zone 3
Dashed land lines indicate approximate locations
The exact locations are shown in black

SCALE 1:24,000

0 1000 2000 3000 4000 5000 6000 7000 FEET

0 1 2 3 4 5 KILOMETER

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION
Medium duty — — — Light duty
Unimproved dirt

LICK OBSERVATORY, CALIF.
SW 4 MT. HAMILTON 15' QUADRANGLE
N 37° 15' W 12 1/2" E
1955

QUADRANGLE LOCATION

FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225 OR WASHINGTON, D.C. 20242
A FULL-SCALE MAP, INCLUDING MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

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