ABBREVIATED EXPLANATION

Approximate stratigraphic relationships only; see Geologic Map Explanation for more accurate age designations and unit descriptions.

CENOZOIC — QUATERNARY — Holocene

- af — Artificial fill
- t — Dredge or mine tailings
- Q — Alluvium
- Qa — Natural levee and channel deposits
- Qb — Basin deposits *(Alluvium)*
- Qls — Landslide deposits
- Ql — Lake deposits
- Qf — Fan deposits
- Qt — Terrace deposits
- Qg — Glacial deposits
- Qm — Modesto Formation *(Alluvium)*
- Qr — Riverbank Formation *(Alluvium)*

Pleistocene

- Qos — Pleistocene nonmarine sedimentary rocks *(Fluvial and lacustrine gravel, sand, silt, and clay)*
- Qrb — Red Bluff Formation *(Coarse red gravel, sand, and silt)*
- QPs — Volcanic sediments of Sutter Buttes *(Volcaniclastic sediments and lahars)*
- QPl — Volcanic lake beds
- Tuffs of Oroville *(Volcaniclastic sediments and tuff)*
- Pnt-Nomlaki Tuff
- Qtv — Tuscan Formation *(Lahars, volcaniclastic sediments, and tuff)*
- Pnt-Nomlaki Tuff
- Qt — Laguna Formation *(Alluvial gravel, sand, and silt)*

Pliocene

- Ps — Pliocene nonmarine sedimentary rocks *(Fluvial and lacustrine shale, sandstone, and ash)*
- MPc — Miocene-Pliocene channel deposits *(Fluvial conglomerates and sandstone)*

Miocene

- MPs — Sutter Formation *(Volcaniclastic sediments; nonmarine)*

Oligocene

Eocene

- Ec — Capay Formation *(Sandstone and shale; marine)*
- Ei — Ione Formation *(Quartzose sandstone, claystone, and conglomerate; mostly nonmarine)*
- Tg — "Auriferous" Gravels

CENOZOIC — TERTIARY

- Qv — Pleistocene volcanic rocks *(b-basalt; bp-scoria and tuff)*
- Volcanic rocks of Sutter Buttes *(QPv*-andesite; QPv*-rhyolite)*
- Pi — Pliocene intrusive rocks *(a-andesite; b-basalt)*
- Pv — Pliocene volcanic rocks *(a-andesite; b-basalt)*
- Cinder cone or volcano; major Pelean domes at Sutter Buttes
- MPi — Miocene-Pliocene intrusive rocks *(a-andesite; b-basalt)*
- MPv — Miocene-Pliocene volcanic rocks *(b-basalt; a-andesite; af-andesite flows; ap-andesite pyroclastic rocks; t-dacitic tuff-breccia)*
- Mlb — Lovejoy Basalt
- Mv — Oligocene-Miocene volcanic rocks *(r-rhyolite tuff and sedimentary rocks)*

CRETACEOUS

- Ku — Upper Cretaceous rocks *(Shale and sandstone; marine)*
- Kc — Chico Formation *(Sandstone, conglomerate, and siltstone; marine)*

MESOZOIC — JURASSIC

SMARTVILLE COMPLEX

- Jmo — Monte de Oro Formation *(Sandstone and slate; marine)*
- Jv — Jurassic volcanic rocks *(Pyroclastic rocks and flows*
- mv — Volcanic rocks
- qd — Quartz diorite and tonalite
- dc — Dike complex
- gb — Gabbroic rocks
- db — Massive diabase
- um — Ultramafic rocks

CENTRAL BELT

- Jm — Mariposa Formation *(Slate and sandstone; marine)*
- Jlr — Logtown Ridge Formation *(Flows and pyroclastic rocks)*

PALEOZOIC AND MESOZOIC ROCKS

MzPz- Undifferentiated
- lc- Lake Combie complex
- sc- Slate Creek complex
- ms - metasedimentary rocks
- mv - metavolcanic rocks
- mvs - volcaniclastic sediments
- ch - chert and chert breccia
- ls - limestone and marble
- db - massive diabase
- qd - metadiorite
- gb - gabbro
- um - ultramafic rocks

MESOZOIC PLUTONIC ROCKS

- KJgr — Granite, granodiorite
- KJqd — Quartz diorite, tonalite, trondhjemite, quartz monzonite
- KJdi — Diorite
- KJgb — Gabbro

- Jgr — Granite, granodiorite
- Jqd — Quartz diorite, trondhjemite
- Jdi — Diorite
- Jgb — Gabbro
- Jum — Ultramafic rocks

EASTERN BELT (Northern Sierra terrane)

- Jms, Jmv — Jurassic (?) metamorphic rocks; Jms- Metasedimentary rocks; Jmv- Metavolcanic rocks; Jmvs- Undivided metasedimentary and metavolcanic rocks
- Sailor Canyon Formation *(Graywacke and slate; marine)* Jls-Limestone and marble
- Triassic metasedimentary rocks *(Phyllite, and conglomerate; marine)* Rls-Limestone

FEATHER RIVER PERIDOTITE BELT

- Metamorphic rocks of unknown age *(Quartz, mica, and hornblende schists)*
- mv-blueschist bearing metavolcanic rocks
- Calaveras Complex *(Chert and argillite)*
- Pzcv - Metavolcanic rocks
- ls - limestone
- Pza — Paleozoic amphibolite
- Pzp, Pzgb — Peridotite of Melones fault zone *(Partially to completely serpentinized)* Pzjb-Gabbro

PALEOZOIC — PERMIAN

- Reeve Formation *(Andesitic breccia, flows, and tuff)*
- Goodhue Formation *(Andesitic and basaltic breccia, pillow lavas, and tuff)*
- Peale Formation *(Bedded chert, shale, pillow lavas, and tuff)*
- Taylor Formation *(Andesitic breccia, tuff, and slate)*
- Sierra Buttes Formation *(Rhyolitic to andesitic flows, breccia, tuffs, and chert)*
- Grizzly Formation *(Conglomerate, sandstone, and chert; marine)*

DEVONIAN

- Shoo Fly Complex
- ss - sandstone, siltstone, and slate
- v - greenstone
- ch - chert and chert breccia
- ls - limestone and marble
- gb - gabbro and diabase
- um - serpentinized ultramafic rocks
- m - undifferentiated melange

ORDOVICIAN-SILURIAN

- Bowman Lake Batholith
- Dbt - Trondhjemite, tonalite
- Dbg - Granite, granodiorite

- PZu — Paleozoic rocks of uncertain age and correlation *(Quartzite, pelite, and conglomerate; marine)*

MAP SYMBOLS

- Contact — Observed or approximately located; queried where gradational or inferred.
- Fault — Solid where well located; dashed where approximately located or inferred; dotted where concealed by younger rocks or water; queried where continuation or existence is uncertain. U, upthrown side; D, downthrown side (relative or apparent). Thrust fault—barbs on the upper plate. Generally dips less than 45°, but locally may have been subsequently steepened. Dashed where approximately located or inferred; dotted where concealed by younger rocks or water; queried where continuation or existence is uncertain.
- Anticlinal fold — Showing direction of plunge; dashed where inferred; dotted where concealed by younger rocks.
- Synclinal fold — Dashed where inferred; dotted where concealed by younger rocks.
- Monoclinal fold
- Strike and dip of beds — General strike and dip of stratified rocks.
- Vertical beds
- Strike and dip of overturned beds
- Strike and dip of foliation — General strike and dip of foliation in metamorphic rocks.
- Vertical foliation
- Strike and dip of dikes

Base Map

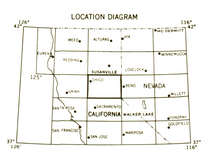
Prepared by the U.S. Army Topographic Command (KCSX), Washington, D.C. Compiled in 1957 from United States quadrangles, 1:24,000, 1:25,000, 1:48,000, 1:50,000, and 1:62,500, 1937-57. Planimetry revised in part from aerial photographs taken 1952 and 1957. Map field checked 1958. Revised in 1970 by the U.S. Geological Survey from aerial photographs taken 1967-69.

Area covered by dashed light-blue pattern is subject to controlled inundation.

Minor corrections and additions to culture by California Division of Mines and Geology 1989.

Depth contours in Lake Tahoe in feet - compiled from soundings shown on U.S. Coast and Geodetic Survey Chart 5001.

LOCATION DIAGRAM



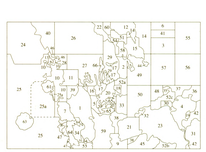
Scale 1:250,000

5 0 5 10 15 20 Statute Miles
5 0 5 10 15 20 25 30 Kilometers
5 0 5 10 15 Nautical Miles

TRANSVERSE MERCATOR PROJECTION

BLACK NUMBERED LINES INDICATE THE 10,000 METER UNIVERSAL TRANSVERSE MERCATOR GRID, ZONE 10

1970 MAGNETIC DECLINATION FROM TRUE NORTH VARIES FROM 18° (220 MILS) EASTERLY FOR THE CENTER OF THE WEST EDGE TO 17 1/2° (310 MILS) EASTERLY FOR THE CENTER OF THE EAST EDGE



ABBREVIATED INDEX TO GEOLOGIC SOURCE DATA
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1. Beard, J.S., 1985
2. Bergquist, J.R., 1986
3. Berry, D.T., 1979
4. Birkeland, P.W., 1961
   Birkeland, P.W., 1963
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61. Turner, H.W., 1900
62. Vahl, J.D., 1980
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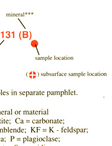
EXPLANATION



*See accompanying tables in separate pamphlet.

**method
^{40}Ar/^{39}Ar Argon — AA
K-Ar Potassium/Argon — KA
Rb-Sr Rubidium/Strontium — RS
U/Pb Uranium/Lead — UPb

*** mineral or material
B = biotite; Ca = carbonate; H = hornblende; KF = K - feldspar; M= mica; P = plagioclase; Q= quartz; S = sanidine; WR = whole rock; Z = zircon

LOCATION MAP OF ROCK SAMPLES DATED RADIOMETRICALLY, CHICO QUADRANGLE, CALIFORNIA, 1:250,000

Compilation by George J. Saucedo
with assistance from
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