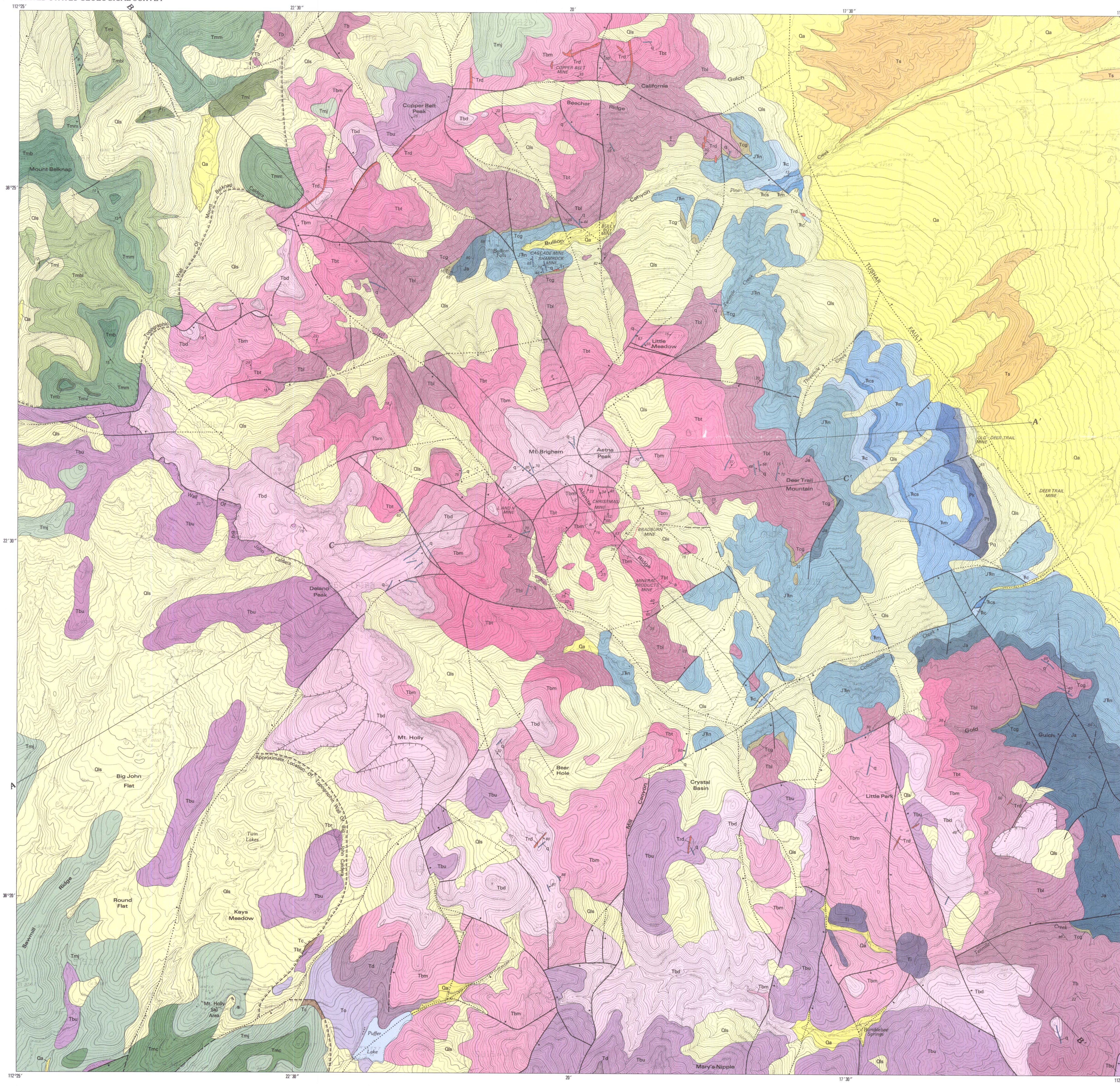
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I-1230

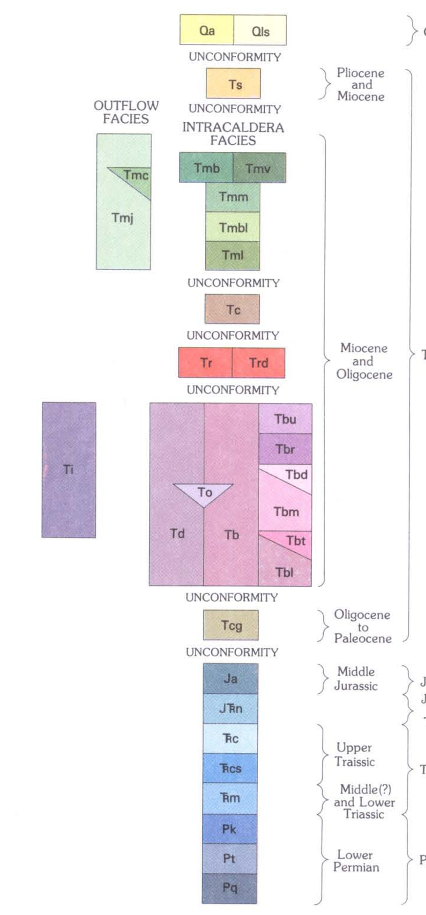


Base from U.S. Geological Survey
Delano Peak NE, NW, SE, SW, 1977

Geology mapped in 1977-1978

QUADRANGLE LOCATION

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qa — ALLUVIAL DEPOSITS (QUATERNARY)—Silt, sand, and gravel in alluvial fans, alluvial slope wash, and stream alluvium

Qls — LANDSLIDE DEBRIS (QUATERNARY)—Includes talus and colluvium

Ts — SEVIER RIVER FORMATION, (PLIOCENE AND MIOCENE)—Poorly to moderately consolidated, gray to tan fanglomerate, conglomerate, sandstone, and siltstone

MOUNT BELKNAP VOLCANICS (MIOCENE)

Tmc — Crystal-rich member—Moderately welded alkali-rhyolite ash-flow tuff containing 30 percent phenocrysts of quartz (3 percent), anorthoclase (24 percent), sodic plagioclase (2 percent), and biotite (1 percent). Outflow facies from the Mount Belknap caldera (Cunningham and Steven, 1979). K-Ar age is 19.0 ± 1.2 m.y. (Steven and others, 1979)

Tmb — Mount Baldy Rhyolite Member—Crystal-poor rhyolite lava flows consisting largely of a fine granular mosaic of quartz and alkali feldspar, and minor plagioclase, biotite, and hematite. Intracaldera facies of the Mount Belknap caldera

Tmv — Volcaniclastic rocks—Dominantly volcanic mudflow breccia derived from nearby lava flows of the Mount Baldy Rhyolite Member (Tmb). Some landslide debris and fluviatile sand and gravel are mapped with unit. Intracaldera facies of the Mount Belknap caldera

Tmj — Joe Lott Tuff Member—Partly welded, crystal-poor light-gray alkali-rhyolite ash-flow tuff containing 1-2 percent phenocrysts of quartz, sodic plagioclase, and sanidine, and traces of biotite. Outflow facies of the Mount Belknap caldera

Tmm — Middle tuff member—Partly welded, crystal-poor alkali-rhyolite ash-flow tuff. Intracaldera facies of the Mount Belknap caldera (Cunningham and Steven, 1979). Lithologically similar to the Joe Lott Tuff Member (Tmj)

Tmbl — Blue Lake Rhyolite Member—Crystal-poor rhyolite lava flows lithologically similar to those in the Mount Baldy Rhyolite Member (Tmb). Contorted flow layers are common. Intracaldera facies of the Mount Belknap caldera

Tml — Lower tuff member—Moderately welded, crystal-poor alkali-rhyolite ash-flow tuff lithologically similar to the Joe Lott Tuff Member (Tmj). Intracaldera facies of the Mount Belknap caldera

Tc — CONGLOMERATE (MIOCENE)—Conglomerate and sandstone. Most rounded clasts were derived from the Bullion Canyon Volcanics. Locally marks the location of the reexcavated topographic wall of the Big John caldera

Tr — RHYOLITE DIKES (MIOCENE)—White to light-yellow rhyolite containing phenocrysts of quartz with beta morphology, partially sericitized sanidine, and minor sodic plagioclase in a matrix of altered sanidine and quartz. K-Ar age is 21.9 ± 1.2 m.y. (Cunningham and others, 1978)

Trd — RHYODACITE DIKES (MIOCENE)—Light-gray rhyodacite containing phenocrysts of Carlsbad-twinned sanidine, andesine, quartz with beta morphology, and chloritized hornblende in a matrix of altered feldspar, quartz, and minor accessory zircon and apatite

Ti — INTRUSIVE ROCKS (MIOCENE)—Dark-gray and dark-brown, equigranular to porphyritic intrusive rock, largely quartz monzonite, consisting of plagioclase, orthoclase, quartz, and augite, with or without hornblende and biotite. Accessory minerals are zircon, apatite, and Fe-Ti oxides

Td — MOUNT DUTTON FORMATION (MIOCENE AND OLIGOCENE)—Dark-gray, dark-brown, and black lava flows, flow breccia, and volcanic mudflow breccia. Largely pyroxene andesite containing phenocrysts of andesine and augite

To — OSIRIS TUFF (MIOCENE)—Gray and reddish-brown, densely welded, crystal-rich ash-flow tuff. Phenocrysts consist of andesine (25 percent), biotite (2 percent), and 1 percent each of sanidine, pyroxene, and Fe-Ti oxides. K-Ar age is about 22 m.y. (Fleck and others, 1975)

Tb — BULLION CANYON VOLCANICS (MIOCENE AND OLIGOCENE)—Heterogeneous lava flows, flow breccia, volcanic mudflow breccia, and tuffaceous sandstone. Lava flows and clasts in breccia range from rhyodacite porphyry containing phenocrysts of plagioclase, biotite, and clinopyroxene, to fine-grained dark-gray rocks of intermediate composition containing small phenocrysts of plagioclase and clinopyroxene

Tbu — Upper member—Mostly rhyodacite to andesite lava flows and local ash-flow tuffs

Tbr — Red lineate tuff member—Thin red markedly lineate, densely welded ash-flow tuff that overlies the Delano Peak Tuff Member (Tbd) and flowed down the topographic wall of the Big John Caldera

Tbd — Delano Peak Tuff Member (Miocene)—Densely welded, crystal-rich quartz latite ash-flow tuff containing phenocrysts of andesine (32 percent), hornblende (9 percent), biotite (4 percent), and less than 1 percent each of quartz, zircon, and apatite. Outflow and intercaldera facies of the Big John caldera. K-Ar age is 21.8 ± 1.0 m.y. (Steven and others, 1979)

Tbm — Middle member—Mostly light-gray and brown rhyodacite lava flows, flow breccia, and volcanic mudflow breccia that lie between the overlying Delano Peak Tuff Member (Tbd) and underlying Three Creeks Tuff Member (Tbt)

Tbt — Three Creeks Tuff Member (Oligocene)—Densely welded, light-gray and brown, crystal-rich quartz latite ash-flow tuff containing phenocrysts of plagioclase (35 percent), hornblende (9 percent), biotite (3 percent), and quartz (2 percent). Fe-Ti oxide minerals, sanidine, and other accessory minerals occur in traces. K-Ar age is 27 m.y. (Steven and others, 1979)

Tbl — Lower member—Mostly volcanic mudflow breccia, flow breccia, and tuffaceous sedimentary rocks that occur below the Three Creeks Tuff Member (Tbt)

Tcg — CONGLOMERATE (OLIGOCENE TO PALEOCENE)—Light-gray to buff pebble conglomerate containing rounded clasts of sandstone and limestone derived from Mesozoic and Paleozoic rocks. Locally contains tuffaceous sandstone

Ja — ARAPIEN FORMATION (MIDDLE JURASSIC)—Light-gray limestone and shale and locally interbedded red to brown sandstone and intraformational limestone conglomerate layers

JTRn — NAVAJO SANDSTONE (JURASSIC AND TRIASSIC?)—Fine-grained buff well-sorted, crossbedded sandstone. The crossbedding dips south

TRc — CHINLE FORMATION (UPPER TRIASSIC)—Green, purple, and red sandstone, siltstone, and mudstone. Laminated and thinly bedded

TRcs — Shinarump Member—Light-brown to brownish-gray crossbedded poorly sorted sandstone. Crossbedding dips northwest

TRm — MOENKOPI FORMATION (MIDDLE? AND LOWER TRIASSIC)—Greenish-gray and purple, fine-grained sandstone and underlying red siltstone and shale. Includes a prominent gray limestone bed near the base

Pk — KAIBAB LIMESTONE (LOWER PERMIAN)—Light- to dark-gray limestone and dolomite

Pt — TOROWEAP FORMATION (LOWER PERMIAN)—Light-gray dolomite and yellowish-gray limestone, sandstone, and quartzite

Pq — QUEANTOWEAP SANDSTONE OF McNAIR, 1951 (LOWER PERMIAN)—Light-tan well-sorted, crossbedded orthoquartzite

CONTACT—Dashed where approximately located

FAULT—Dashed where approximately located; dotted where concealed. Bar and ball on downthrown side. Amount and direction of dip shown where known

ALUNITE VEIN

QUARTZ VEIN—Amount and direction of dip shown where known

STRIKE AND DIP OF SEDIMENTARY BEDS OR LAVA FLOWS

STRIKE AND DIP OF COMPACTION FOLIATION

TOPOGRAPHIC WALL OF CALDERA—Solid where it follows a contact, broken where concealed; hachures are grouped

BREAKAWAY SCARP AT HEAD OF A COHERENT BLOCK OF SLUMPED BEDROCK

REFERENCES

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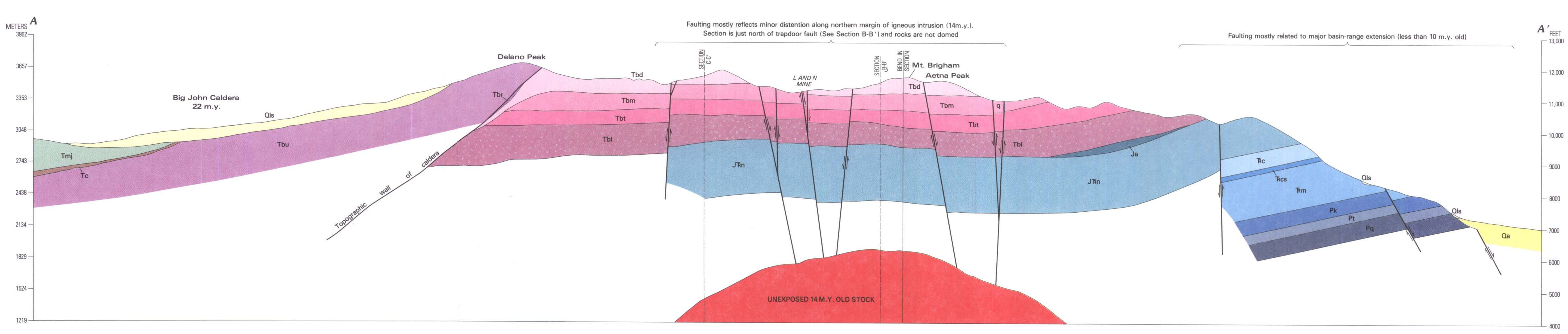

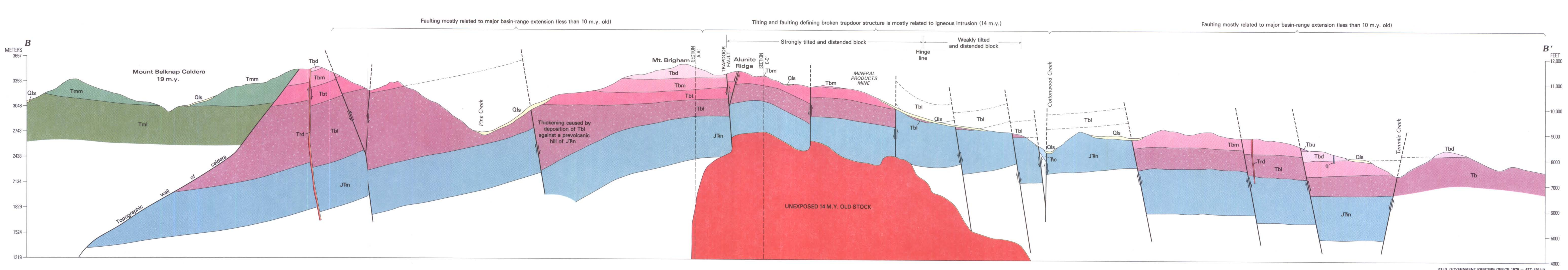

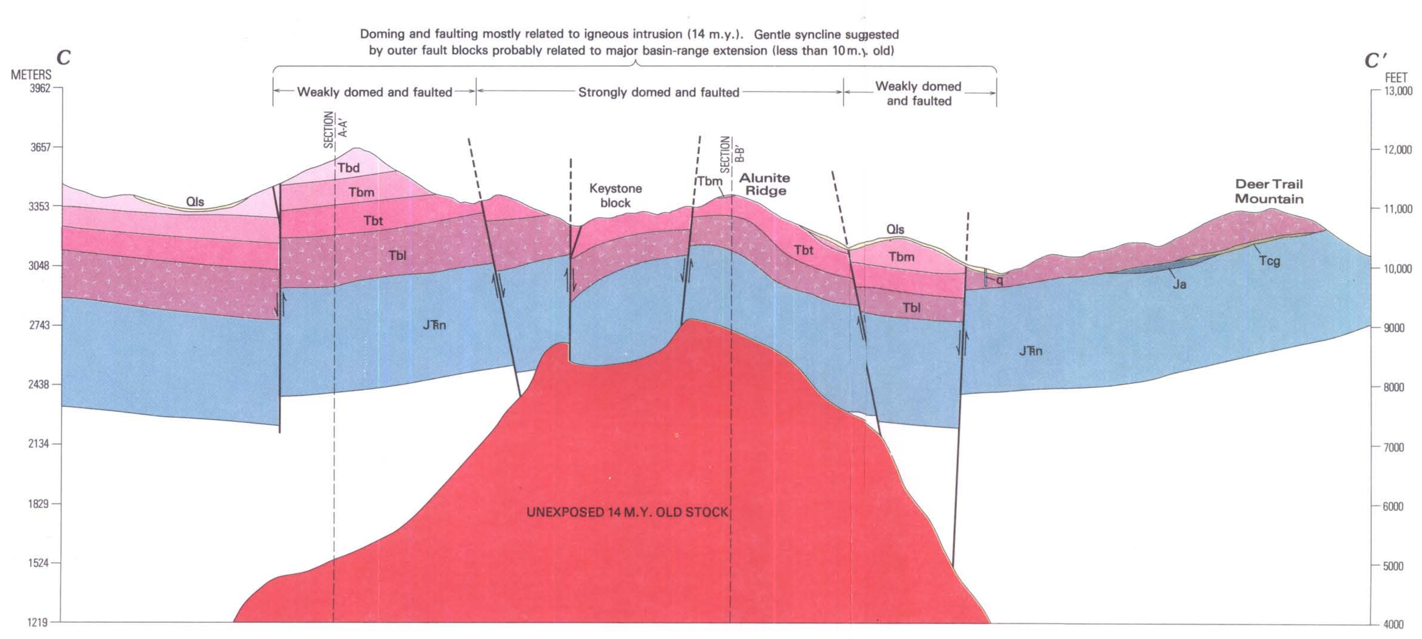

SCALE 1:24 000

1 MILE

1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

GEOLOGIC MAP OF THE DEER TRAIL MOUNTAIN-ALUNITE RIDGE MINING AREA, WEST-CENTRAL UTAH

By

Charles G. Cunningham and Thomas A. Steven

1979

For sale by Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225