

Geology mapped by J.P. Calzia and B.W. Troxel 1970-2002. Geology of Valjean Hills modified from Heasler and Friend (1986). Digital preparation by G.G. Raumann.

GEOLOGIC MAP OF THE VALJEAN HILLS 7.5' QUADRANGLE, SAN BERNARDINO COUNTY, CALIFORNIA

By
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Digital database by
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2002

CORRELATION OF MAP UNITS

Geological time scale: CENOZOIC (APLACENTARIAN, PLEISTOCENE AND HOLOCENE, MIOCENE), TERTIARY, MESOZOIC (CRETACEOUS, JURASSIC, TRIASSIC, PERMIAN, CARBONIFEROUS, DEVONIAN, SILURIAN, ORDOVICIAN, CAMBRIAN), EARLY PROTEROZOIC, LATE PROTEROZOIC, MIDDLE PROTEROZOIC, EARLY PROTEROZOIC.

DESCRIPTION OF MAP UNITS

- Qw** Stream wash deposits (Holocene)-Unconsolidated silt, fine- to medium-grained sand, and rare gravel in active stream channels
- Qs** **Eolian sand deposits (Holocene)**
- Qa** **Alluvium (Holocene)**-Undeformed silt, fine- to coarse-grained sand, and gravel deposits that form the present-day depositional surface
- Qat** **Stream terrace deposits (Holocene)**-Sandy gravel deposits 0.5 to 2.0 m above active stream channels
- Qyf** **Younger alluvial fan deposits (Holocene and Pleistocene)**-Undeformed alluvial fan deposits that are locally dissected and topographically higher than alluvium (Qa). The fan deposits consist of subangular to subhangular cobbles and boulders of Tertiary lacustrine deposits, Miocene granite and volcanic rocks, and Paleozoic and Proterozoic sedimentary rocks in a matrix of silt, fine- to coarse-grained sand, and gravel. Boulders within the fan deposits are up to 2 m in diameter
- Qof** **Granite boulder fan (Holocene and Pleistocene)**-Similar to younger alluvial fan deposits (Qyf) but consists almost exclusively of subrounded boulders derived from the granite of Kingston Peak
- Qoa** **Older alluvial deposits (Pleistocene and Pliocene?)**-Faulted and dissected alluvial fan and lacustrine deposits that are topographically higher than younger alluvial fan deposits (Qyf). The alluvial fan deposits consist of conglomerate, pebbly sandstone, and fine- to coarse-grained sandstone. The conglomerate consists of subrounded to subhangular cobbles and boulders of the granite of Kingston Peak and lesser amounts of Tertiary volcanic rocks as well as Proterozoic sedimentary rocks in a matrix of silt and fine- to coarse-grained sand. Layers of pebbly sandstone and sandstone are 1 to 3 m thick and become finer grained up section, the sandstone is locally cross bedded. Bedding is locally well developed and expressed by alternating layers of conglomeratic and sandstone.
- Qol** **Older alluvial fan deposits (Pleistocene and Pliocene?)**-Faulted and dissected alluvial fan deposits that occur at approximately the same elevation as the older alluvial deposits (Qoa). Older alluvial fan deposits consist of cobble and boulder conglomerate in a matrix of silt, fine- to coarse-grained sand, and gravel. Subangular to subrounded conglomerate clasts are predominantly granite with lesser amounts of Paleozoic and Proterozoic sedimentary rocks as well as Tertiary volcanic rocks. Bedding is poor to nonexistent; where exposed, bedding is horizontal to subhorizontal
- Brc** **Breccia (Miocene)**-Breccia units consisting of a heterogeneous mixture of allochthonous blocks and fragments derived from various formations in the Kingston Range just east of this quadrangle; the geology of the Kingston Range is described by Calzia and others (2000). Chaotic stacking of heterogeneous breccia into short linear or lens-shaped ridges suggests that the breccia units are landslide breccias that formed with uplift of the Kingston Range
- Brg** **Granite breccia**-Breccia derived predominantly from granite of Kingston Peak with lesser amounts of the granite of Rabbit Holes Spring. Includes rare cobbles and boulders of gneiss
- Tdf** **Diabase breccia**-Breccia derived from diabase, granite, quartzite, siltstone and sandstone from the upper member of the Crystal Spring Formation, and volcanic rocks. These breccias are interlayered with lacustrine deposits of the China Ranch beds and include a lens of breccia derived from a rhyolite dike (Tbr)
- Tbn** **Noonday breccia**-Breccia derived predominantly from the Noonday Dolomite with lesser amounts from the upper member of the Crystal Spring Formation and unidentified quartzite
- Yku** **Kingston Peak breccia**-Breccia derived from diamictite from the upper member of the Kingston Peak Formation as well as fragments of green siltstone, dark laminated sandy mudstone with relatively thick beds of fine- to medium-grained sandstone, and medium brown and black dolomite and limy dolomite. Modern landslide deposits (Tdk) are locally developed along oversteepened fault scarps within this formation
- Tbb** **Beck Spring breccia**-Breccia derived from the Beck Spring Dolomite and other unidentified carbonate rocks
- Tbk** **Mixed breccia**-Breccia consisting of fragments of 1) brown carbonate rocks, 2) red brown and black massive and laminated dolomite, 3) graded beds of green fissile shale, purple fine-grained arkosic sandstone, and brown medium- to coarse-grained arkosic sandstone with quartz pebbles, and 4) conglomerate with angular cobbles of red brown and black limy dolomite, mudstone, and red coarse-grained sandstone in brown medium- to coarse-grained sandstone matrix
- Tbc** **Carbonate breccia**-Breccia derived primarily from the Bonanza King Formation and lesser amounts from the Anchor member of the Sultan Limestone Breccia derived from the Bonanza King Formation consists of angular to subrounded fragments, 0.5-20.0 cm in diameter, of dark to blue gray finely crystalline massive dolomite with local interbeds of white chert and dolomite nodules, laminated silty limestone and gray to reddish brown dolomite; these fragments resemble the Popose Lake member of the Bonanza King Formation. Near the Valjean Hills fault, this breccia consists of angular to subhangular pebbles and cobbles of coarse- to very fine-grained sandstone, dolomitic sandstone, and dark gray carbonate clasts in reddish brown matrix. The sandstone clasts were derived from the underlying Johnnie Formation
- Yku** **Gray monzogranite**-Medium-grained biotite monzogranite with rare zircon, epidote, and amphibole inclusions; contains occasional quartz phenocrysts up to 3 cm across, 6-8 percent mafic minerals, and microcline inclusions. Stopped blocks of gray monzogranite from the granite of Rabbit Holes Spring are common. The quartz porphyry facies forms gradational contacts with the 12.4 Ma feldspar porphyry facies of the granite of Kingston Peak in the Kingston Range (Calzia, 1990)
- Yk** **Tan monzogranite**-Medium- to coarse-grained monzogranite; generally equigranular but locally porphyritic. Pegmatite dikes and outcrops of gray monzogranites are common
- Yb** **Bonanza King Formation (Cambrian)**-Banded gray and black dolomite and limestone overlain by massive dark gray mottled dolomitic limestone. The banded unit contains occasional chert nodules and oolitic dolomite; the massive unit includes thin clayey and sandy limestone beds. The base of this formation is marked by thin-bedded grayish orange silt limestone, dolomite, and shale
- Cz** **Carrara Formation (Cambrian)**-Silty or calcareous shale interbedded with thin- to medium-bedded limestone and limy mudstone. The shale included micaceous sand or silt lenses and minor quartzite; the limestone is generally laminated and locally oolitic
- Yz** **Zabriske Quartzite (Cambrian)**-Cross-bedded, pale-red to gray fine- to medium-grained quartz arenite with granules and rounded cobbles of red chert and white quartz. These rocks are overlain by gray fine- to medium-grained quartz sandstone with poorly developed ripple marks and rough cross beds
- Czw** **Wood Canyon Formation (Cambrian and Late Proterozoic)**-Massive and cross-bedded medium- to fine-grained feldspathic or micaceous sandstone, medium- to fine-crystalline dolomite, cross-bedded arkosic quartz pebble conglomerate, and purple-red siltstone. Micaceous siltstone and sandy dolomite lenses in micaceous sandstone become more common up section
- Zs** **Stirling Quartzite (Late Proterozoic)**-White to brownish red coarse- to fine-grained quartzite, feldspathic, and arkosic sandstone locally overlain by thin upward cycles of purple, gray, and yellow brown micaceous siltstone and medium-grained feldspathic sandstone. These rocks are overlain by gray and pink medium- and coarse-grained quartzite sandstone with thin interbeds of pinkish to greenish siltstone and shale. Rounded to subrounded quartz pebbles are common near the base and top of this formation. Sandstone beds are characterized by planar and truncated cross beds
- Zju** **Johnnie Formation (Late Proterozoic)**-Siltstone, sandstone, and carbonate rocks informally divided into upper, middle, and lower members. **Upper member**-Purple siltstone with interbeds of gray medium- to coarse-grained quartz arenite, orange oolitic dolomite, and fine- to medium-grained quartz arenite. Red-brown dolomite and sandy dolomite mark the base of this member. The oolite is locally separated into two beds by purple siltstone; the lower quartz arenite is locally graded from pebble sandstone to sandstone

- Zm** **Middle member**-White to pale gray, fine- to coarse-grained quartz arenite, purple to gray shale, and red-brown finely crystalline dolomite. The quartz arenite is locally graded or cross bedded and includes subrounded pebbles at the base
- Zi** **Lower member**-Quartzite and dolomitic sandstone overlying fine- to coarse-grained quartz arenite
- Zl** **Johnnie Formation**-Undivided. In cross section only
- Z2** **Ilex Formation (Late Proterozoic)**-Maroon to purple fissile siltstone and shale, medium- to coarse-grained arkosic sandstone, and brown to gray finely crystalline limestone
- Z3** **Noonday Dolomite (Late Proterozoic)**-Well-bedded finely crystalline light purple dolomite; locally cross bedded
- Yku** **Kingston Peak Formation (Middle Proterozoic)**-A siliceous sequence informally divided into upper, middle, and lower members
- Yku** **Upper member**-Turbidite deposits, diamictite, and breccia consisting of diabase clasts in the Kingston Range, and interbedded shale, siltstone, and red-brown fine- to medium-grained arkosic sandstone in the Valjean Hills. The arkosic sandstone becomes more common up section and includes interbeds of red to purple siltstone and pebble to boulder conglomerate. The conglomerate consists of gray dolomite and quartz arenite clasts. Lenses of megacrinite derived from the Beck Spring Dolomite (Yku) are common
- Ykm** **Middle member**-Diamictite consisting of rounded to subangular cobbles and boulders of Beck Spring Dolomite, Crystal Spring Formation, and 1.1 Ga diabase in matrix of dark medium-grained sandstone and limy mudstone. In cross section only, no outcrops within the Valjean Hills Quadrangle
- Yk** **Lower member**-Massive to thinly bedded green siltstone and fine-grained arkosic sandstone. Siltstone locally includes laminated shale
- Yb** **Beck Spring Dolomite (Middle Proterozoic)**-Gray medium- to coarse-crystalline laminated dolomite. Truncated algal mounds are common
- Yc** **Crystal Spring Formation (Middle Proterozoic)**-Conglomerate, sandstone, siltstone, shale, and carbonate rocks locally intruded by 1.1 Ga diabase. In cross section only; no outcrops within the Valjean Hills Quadrangle
- Ygn** **Gneiss (Early Proterozoic)**-Coarse-grained granitic gneiss cut by 1.7- Ga pegmatite dikes and milky quartz veins. In cross section only; no outcrops within the Valjean Hills Quadrangle

- Contact-Dashed where approximately located
- Fault-Dashed where approximately located, dotted where concealed, queried where uncertain. Ball and bar on downthrown side
- Valjean Hills Fault-Tick marks on upper plate
- Anticline-Dashed where approximately located, arrow in direction of plunge
- Syncline-Dashed where approximately located, arrow in direction of plunge
- Dike
- Unconformity (shown only in cross section)
- Facies change (shown only in cross section)
- Landslide-Arrows in direction of down slope motion
- Strike and dip of bedding
- Horizontal bedding

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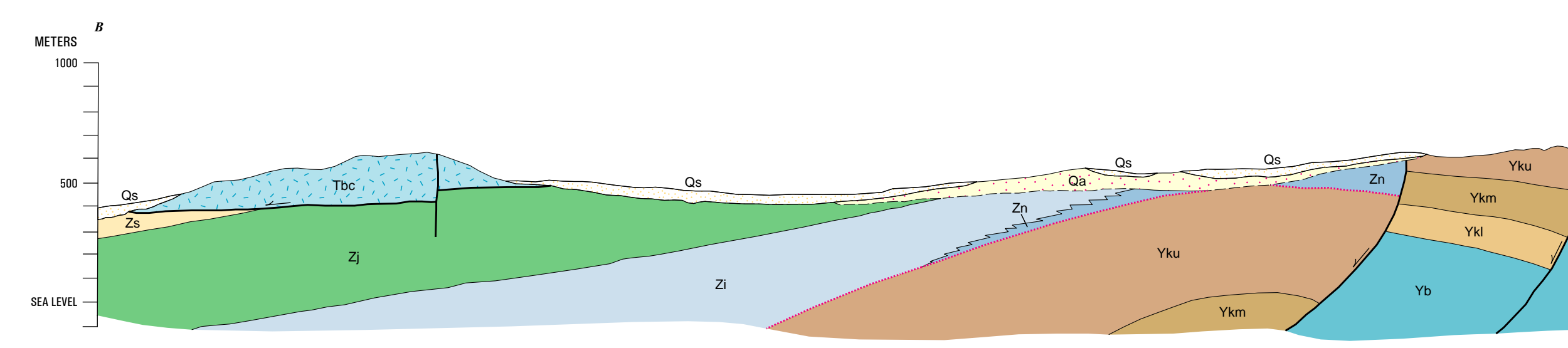
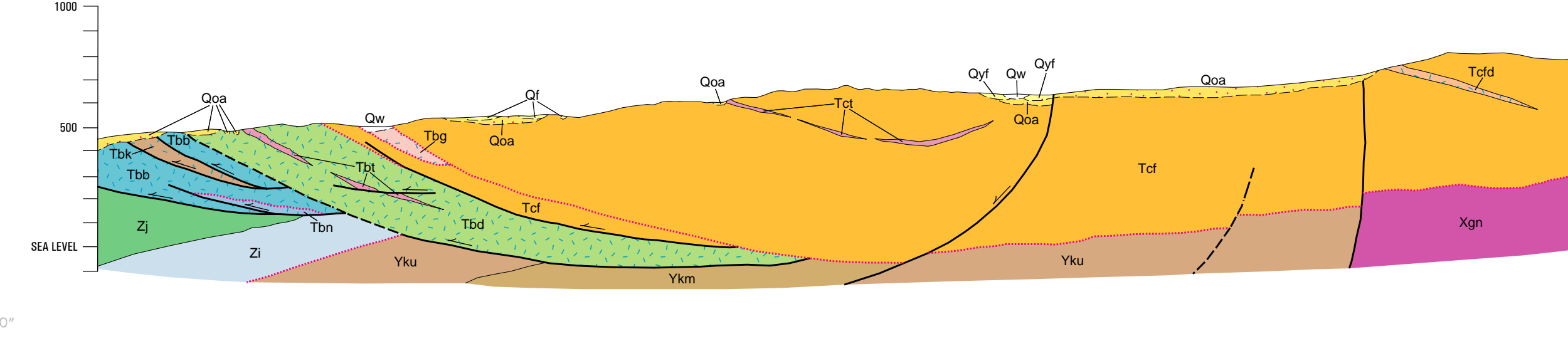
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VERTICAL SCALE = 1.22 HORIZONTAL SCALE

SURROUNDING 7.5' QUADRANGLES			
Tropas	Tropicana	North Star	
Dunsmuir	Valjean Hills	Kingston Peak	
Shannon Lake	Bonanza King	Wood Canyon	