

By

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This illustration is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature.

EXPLANATION

*Phocener(?) and Pleistocene Holocene and Miocene*

*Oligocene and Miocene*

*Age relations of some units uncertain*

*Paleocene(?)*

*Upper Cretaceous*

*Lower Cretaceous*

*Bisbee Group*

*Middle and Upper Cambrian*

*Middle Cambrian*

*Upper Mississippian of Lower Pennsylvanian?*

*Middle Pennsylvanian Upper Pennsylvanian*

*Lower Permian*

*Naco Group*

*PERMIAN*

*PENNSYLVANIAN*

*MISSISSIPPIAN OR PENNSYLVANIAN?*

*MISSISSIPPIAN*

*DEVONIAN*

*CAMBRIAN*

*PRECAMBRIAN*

**QUATERNARY**

**Qal**  
Alluvium

**Qls**  
Landslide

**Qg**  
Pediment, terrace, and fan gravels

**QTg**  
Deformed gravel and basin fill

**Jkc**  
Canelo Hills Volcanics  
Light-pinkish-gray to light-yellowish-gray fine- to medium-grained thin-bedded tuffaceous sandstone; light-gray siliceous tuff; light-gray siliceous conglomerate at base. About 600 feet thick.

**Trg**  
Gardner Canyon Formation  
Moderate-red to purplish-red shaly mudstone with interbedded sandstone, conglomerate, and one lithic tuff; few thin beds of dark-gray limestone in lower part; conglomerate near base consists of detritus from Paleozoic formations; one conglomerate bed consists mainly of light-colored angular chert pebbles in a matrix of chert sandstone; conglomerate above the latite tuff contains indurated pebbles of the tuff and other light-colored volcanic rocks, and some pebbles of red and black chert set in a mudstone matrix. About 1,200 feet thick.

**UNCONFORMITY(?)**

**Prv**  
Rainvalley Formation  
Medium-gray medium- to thin-bedded limestone; local thin beds of yellowish-gray to pinkish-gray fine- to medium-grained sandstone and sandy limestone. As much as 400 feet thick.

**Pcn**  
Concha Limestone  
Medium-gray thick-bedded limestone with abundant chert nodules in many beds. Becomes sandy and dolomitic near base. About 600 feet thick.

**Psu**  
**Psm**  
**Psl**  
Scherrer Formation  
Psu, upper member of light-gray to pinkish-gray fine-grained calcareous cross-laminated sandstone. As much as 140 feet thick.  
Psm, middle member of gray to pale-orange thin-bedded dolomite and dolomitic limestone. About 125 feet thick.  
Psl, lower member of light-yellowish-brown fine-grained calcareous cross-laminated sandstone; a few thin beds of dolomite; red marly siltstone at base. About 450 feet thick.

**Peu**  
**Pem**  
**Pel**  
Epitaph Formation  
Peu, upper member of medium- to dark-gray medium- to thick-bedded dolomite and limestone; locally contains chert nodules. About 90 feet thick.  
Pem, middle member of yellowish-gray to pale-pink marlstone, siltstone, and silty dolomite; locally contains beds of gypsum. About 600-800 feet thick.  
Pel, lower member of medium- to dark-gray medium- to thin-bedded dolomite; locally contains quartz geodes. About 200-400 feet thick.

**Pc**  
Colina Limestone  
Medium- to dark-gray thick-bedded limestone. About 65 feet thick.

**Pue**  
Earp Formation  
Greenish-gray light-brown and pale-red siltstone and sandstone; few thin beds of limestone; thin lenticular bed of chert pebble conglomerate about 300 feet above base. As much as 900 feet thick.

**Fh**  
Horquilla Limestone  
Light-pinkish-gray to yellowish-gray medium-grained thick- to medium-bedded marble; a few thin beds of light-gray dolomitic marble; contains lenses and nodules of chert locally altered to wollastonite and tremolite; interbedded greenish-gray to light-yellowish-brown hornfelsed siltstone and marlstone; dark-greenish-gray hornfels at base contains angular chert pebbles. About 1,000 feet thick.

**Fmb**  
Black Prince Limestone  
Light-pinkish-gray to yellowish-gray medium-grained thick- to medium-bedded marble; abundant chert lenses and nodules; dark-greenish-gray hornfels at base contains angular chert pebbles and cobbles. About 65 feet thick.

**UNCONFORMITY**

**Me**  
Escabrosa Limestone  
White coarse-grained marble and bluish-gray dolomitic marble; numerous chert nodules locally altered to wollastonite. As much as 600 feet thick.

**UNCONFORMITY(?)**

**Dm**  
Martin Formation  
Light-olive-gray to greenish-gray thin- to medium-bedded dolomite and limestone, pale-pink marble; white quartzite; greenish-gray hornfels and shale; metamorphosed to garnetite and serpentine limestone near contact of quartz monzonite. About 1 foot of conglomeratic sandstone at base. About 215 feet thick.

**UNCONFORMITY**

**Ca**  
Abrigo Limestone  
Upper part medium-gray limestone containing numerous laminae of light-brown-weathering limestone; lower part greenish-brown shale with interbedded silty limestone and dolomite; generally metamorphosed to marble, hornfels, and garnetite. About 800 feet thick.

**cb**  
Bolsa Quartzite  
Light-pinkish-gray to purplish-red crossbedded quartzitic sandstone; feldspathic and conglomeratic in lower part; a few thin beds of hornfelsed shale in upper part. As much as 400 feet thick.

**UNCONFORMITY**

**pcg**  
Granitoid igneous rocks  
Gneissic quartz diorite; porphyritic quartz monzonite; microcline-muscovite-quartz pegmatite

**p6p**  
Pinal Schist  
Quartz-sericite schist; phyllite; metagraywacke; quartzite

**TERTIARY**

**Tr**  
Rhyolitic tuff

**Ti**  
Rhyolitic dikes and plugs

**Ta**  
Andesite  
Vesicular and amygdaloidal andesitic intrusive

**Tq1**  
Quartz latite porphyry

**Tl**  
Lamprophyre, andesite, and diabase dikes and sills

**TKm**  
Quartz monzonite  
Light- to medium-gray quartz monzonite stock; contains dikes and irregular masses of aplite

**Kg**  
Quartz diorite  
Dark-greenish-gray quartz diorite stock

**Ke**  
Quartz monzonite of Empire Mountains stock  
Light- to medium-gray

**Ksu**  
**Ksw**  
**Kse**  
Salero Formation  
Ksu, interbedded conglomerate, sedimentary breccia, sandstone, mudstone, and volcanic flows and breccias; about 2,700 feet thick.  
Ksw, rhyodacitic welded tuff; as much as 1,500 feet thick.  
Kse, andesitic to dacitic flows and flow-breccias, mudstone, and conglomerate; locally includes exotic blocks of sedimentary and volcanic rocks; about 2,000 feet thick.

**Kr**  
Rhyodacitic sills and dikes  
Light-yellowish-gray felsitic rhyodacite

**UNCONFORMITY**

**Kf**  
Fort Crittenden Formation  
Conglomerate, conglomeratic graywacke, and poorly sorted mudstone; as much as 1,400 feet thick.

**UNCONFORMITY**

**Kt**  
Turney Ranch Formation  
Grayish-red to purplish-red mudstone and siltstone, pinkish-gray to pale-orange cross-laminated arkosic sandstone, and a few thin beds of conglomerate; about 3,200 feet thick.

**Ks**  
Shellenberger Canyon Formation  
Olive-gray, olive-brown, reddish-brown, and greenish-gray mudstone and siltstone; olive-gray, olive-brown, and pinkish-gray massive to cross-laminated arkosic sandstone and graywacke; few thin beds of dark-gray limestone in lower 1,300 feet; about 4,300 feet thick. Lower 1,000 feet grades northward into Glance Conglomerate.

**Ka**  
Apache Canyon Formation  
Dark-gray to black thin-laminated to thick-bedded silty limestone; dark-gray to black shale; dark-gray to pale-red thin-bedded to massive calcareous siltstone; yellowish-gray to olive-brown fine to very coarse grained massive to crossbedded arkosic sandstone; about 1,600 feet thick. Grades northward into Glance Conglomerate.

**Kw**  
Willow Canyon Formation  
Yellowish-gray to yellowish-brown, medium- to coarse-grained, crossbedded arkosic sandstone and conglomeratic sandstone; dark-reddish-brown to greenish-gray massive to thin-bedded mudstone; few thin beds of dark-gray silty limestone in upper 300 feet; about 3,600 feet thick. Grades northward into Glance Conglomerate.

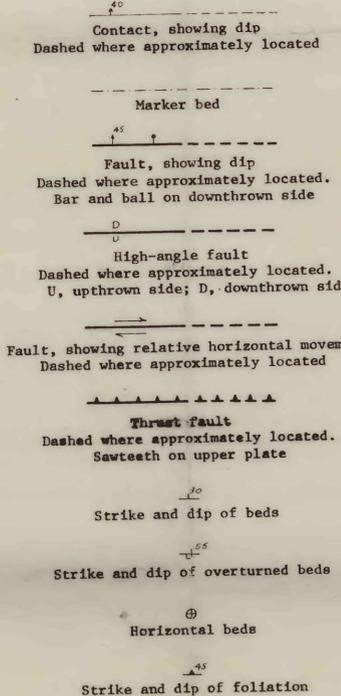
**Kg**  
Glance Conglomerate  
Pebble to boulder conglomerate consisting of subangular to subrounded detritus from the Gardner Canyon Formation (Trg), Paleozoic formations, and Precambrian quartz diorite (p6) set in a matrix of grayish-red to greenish-gray sandstone and siltstone; minor beds of siltstone and sandstone; ranges from 1 foot to 5,600 feet in thickness. e, exotic blocks of Paleozoic sedimentary rock.

**CRETACEOUS OR TERTIARY**

**CRETACEOUS**

**CRETACEOUS**

**CRETACEOUS**



PLEASE REPLACE IN POSITION IN BACK OF BOUND VOLUME