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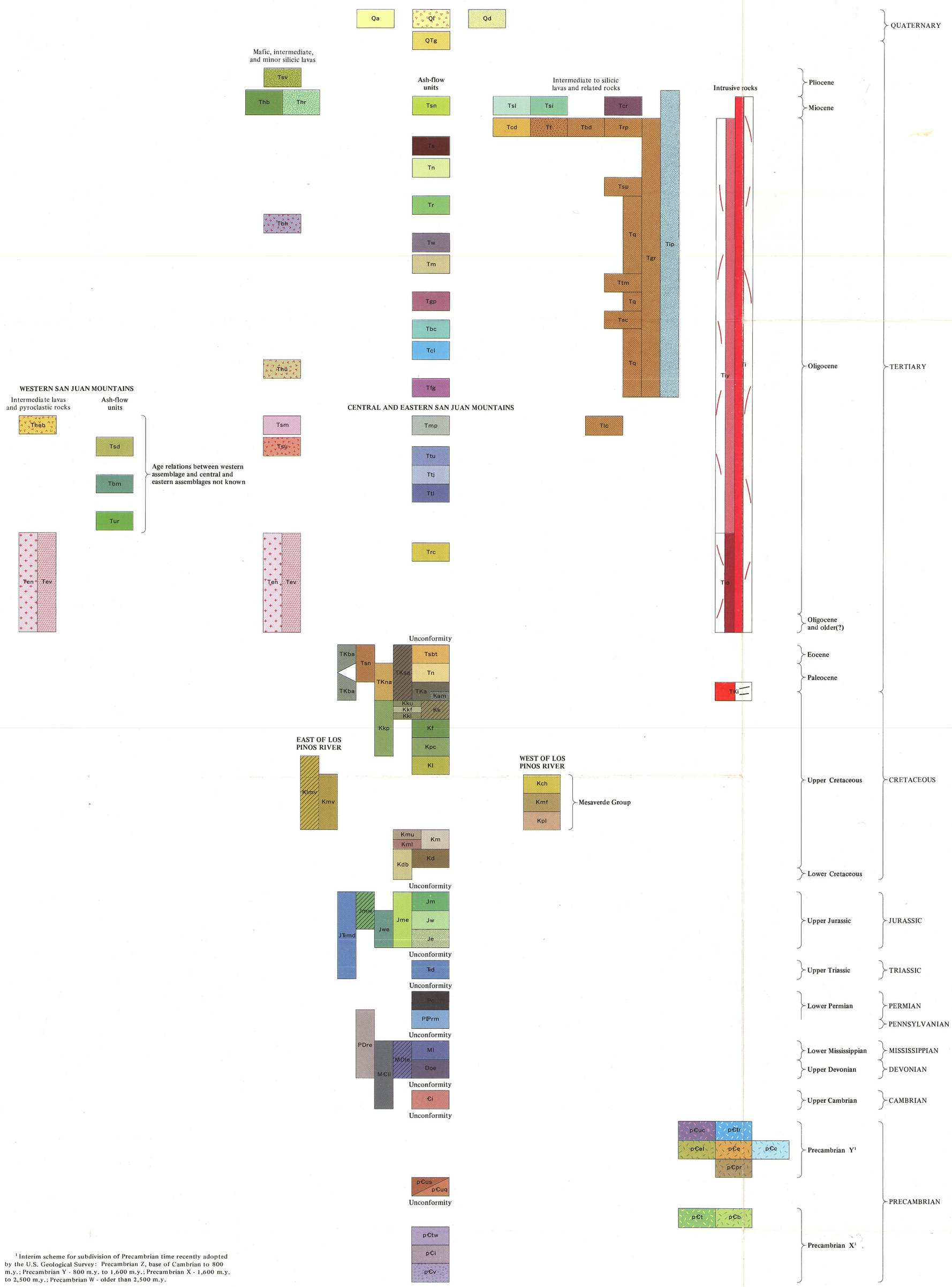
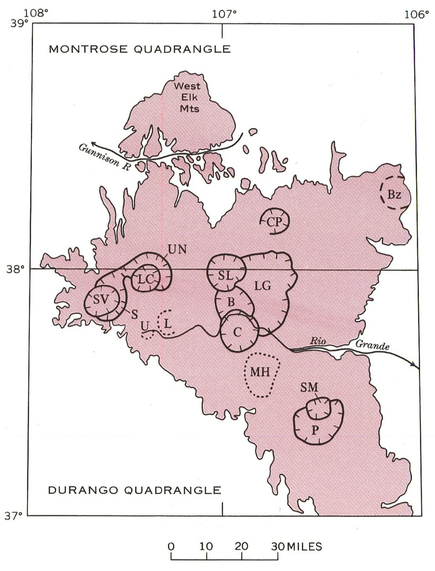
CORRELATION OF MAP UNITS



[1] Interim scheme for subdivision of Precambrian time recently adopted by the U.S. Geological Survey: Precambrian Z, base of Cambrian to 800 m.y.; Precambrian Y - 800 m.y. to 1,600 m.y.; Precambrian X - 1,600 m.y. to 2,500 m.y.; Precambrian W - older than 2,500 m.y.



MAP OF THE SAN JUAN VOLCANIC FIELD SHOWING CALDERAS AND AREA OF THE DURANGO QUADRANGLE

EXPLANATION

Known or readily inferred caldera — Postulated caldera — Buried caldera

SYMBOL	CALDERA	ASSOCIATED TUFF
B	Bachelor	Carpenter Ridge and Bachelor Mountain Tuffs
Bz	Bonanza	Bonanza Tuff
C	Creede	Snowshoe Mountain Tuff
CP	Cochetopa Park	Nelson Mountain Tuff
L	Lost Lake	Blue Mesa(?) Tuff
LC	Lake City	Sunshine Peak Tuff
LG	La Garita	Fish Canyon and La Garita Tuffs
MH	Mount Hope	Tuff of Masonic Park
P	Platoro	La Jara Canyon Member of Treasure Mountain Tuff
SM	Summitville	Ra Jadero and Ojito Creek Members of Treasure Mountain Tuff
S	San Juan	Sapinero Mesa and Eureka Tuffs
SV	Silverton	Tuff of Crystal Lake
SL	San Luis	Rat Creek Tuff
U	Ute Creek	Tuff of Ute Ridge(?)
UN	Uncompahgre	Sapinero Mesa and Eureka Tuffs and Dillon Mesa(?) Tuff

DESCRIPTION OF MAP UNITS

Ages of volcanic rocks in millions of years (m.y.) from P. W. Lipman, T. A. Steven and H. H. Mehnert (1970, Volcanic history of the San Juan Mountains, Colorado, as indicated by potassium-argon dating: Geol. Soc. America Bull., v. 81, no. 8, p. 2329-2352) and H. H. Mehnert (written commun., 1971). Ages of Precambrian rocks (m.y.) from Fred Barker (1969, Precambrian geology of the Needle Mountains, southwestern Colorado: U.S. Geol. Survey Prof. Paper 644-C). Calderas that formed in response to major ash-flow eruptions are indicated in descriptions of appropriate units.

SURFICIAL DEPOSITS

Qa — ALLUVIAL DEPOSITS (QUATERNARY) – Alluvium, terrace gravels, and alluvial fan deposits.

Ql — LANDSLIDE DEBRIS (QUATERNARY).

Qd — GLACIAL DRIFT (QUATERNARY).

QTg — OLDER GRAVELS (QUATERNARY AND TERTIARY) – Dissected remnants of older alluvial deposits along west side of San Luis Valley.

GENERAL VOLCANIC SEQUENCE

MAFIC, INTERMEDIATE, AND MINOR SILICIC LAVAS

Tsv — SERVILLETA FORMATION (PLIOCENE; 3.6-4.5 m.y.) – Medium- to fine-grained diktytaxitic flows of olivine tholeiite in the Rio Grande depression.

HINSDALE FORMATION (PLIOCENE AND MIOCENE; 4.7-23.4 m.y.):

Thb — Basalt flows – Fine-grained silicic alkali olivine basalt and basaltic andesite, generally containing olivine phenocrysts. Xenocrysts of quartz and feldspar locally abundant.

Thr — Rhyolite flows and necks – Silicic alkali rhyolites, generally containing phenocrysts of microperthitic anorthoclase or sodic sanidine, quartz, and biotite.

Tbh — ANDESITE OF BRISTOL HEAD (OLIGOCENE) – Aphanitic to sparsely porphyritic dark-gray to black andesitic flows and breccias.

Thu — HUERTO FORMATION (OLIGOCENE) – Aphanitic to sparsely porphyritic dark andesite to rhyodacite flows and breccias. Some rocks have prominent thin tabular plagioclase phenocrysts.

Tsm — SHEEP MOUNTAIN FORMATION (OLIGOCENE) – Aphanitic to sparsely porphyritic dark andesite to rhyodacite flow and breccias. Some rocks have prominent thin tabular plagioclase phenocrysts.

Tsu — ANDESITE OF SUMMITVILLE (OLIGOCENE) – Aphanitic to sparsely porphyritic dark andesitic flows and breccias within Platoro and Summitville calderas.

EARLY INTERMEDIATE LAVAS AND BRECCIAS (OLIGOCENE AND OLDER?; 31.1-34.7 m.y.) – Includes Conejos Formation, Lake Fork Formation, Beidell Quartz Latite, and Tracy Creek Quartz Latite, San Juan Formation, and Picayune Formation, and parts of the previously mapped Burns Formation, Henson Formation, and Eureka Tuff in the western part of the quadrangle:

Ten — Near-source facies – Mostly flows and breccias of aphanitic to prominently porphyritic andesite and rhyodacite from many centers. Some dark andesites contain prominent thin tabular plagioclase phenocrysts. More silicic fine-grained to coarsely porphyritic quartz latite and rhyolite occur locally.

Tev — Volcaniclastic facies – Mostly reworked, bedded conglomerates, sandstones, and mudflow breccias of dark andesite and rhyodacite clasts.

ASH-FLOW UNITS

Tsn — SUNSHINE PEAK TUFF (MIOCENE; 22.5 m.y.) – Silicic light-gray rhyolite ash-flow tuff containing prominent phenocrysts of quartz, sodic sanidine, and biotite. Lake City caldera.

Ts — SNOWSHOE MOUNTAIN TUFF (OLIGOCENE) – Red-brown biotite-pyroxene quartz latite ash-flow tuff containing 35-60 percent phenocrysts, mainly plagioclase, biotite, and augite. Creede caldera.

Tn — NELSON MOUNTAIN TUFF (OLIGOCENE) – Compositionally zoned ash-flow sheet, ranging from biotite-augite-plagioclase quartz latite containing about 30 percent phenocrysts in upper part, to phenocryst-poor biotite-plagioclase-sanidine rhyolite in lower part. Cochetopa Park caldera.

Tr — RAT CREEK TUFF (OLIGOCENE) – Compositionally zoned ash-flow sheet, ranging from crystal-rich densely welded biotite-pyroxene-plagioclase quartz latite ash-flow tuff in upper part, to crystal-poor weakly welded rhyolite ash-flow tuff in lower part. San Luis caldera.

Tw — WASON PARK TUFF (OLIGOCENE) – Red low-silica rhyolite ash-flow tuff containing about 30 percent phenocrysts of tabular feldspar, platy biotite, and sparse pyroxene. White tridymitic collapsed pumice fragments are characteristic.

Tm — MAMMOTH MOUNTAIN TUFF (OLIGOCENE); 26.7 m.y.) – Compositionally zoned ash-flow sheet, ranging from biotite-pyroxene-plagioclase quartz latite containing 30-50 percent phenocrysts in upper part, to crystal-poor rhyolite ash-flow tuff containing less than 10 percent phenocrysts in lower part.

Tgp — PHOENIX PARK MEMBER OF LA GARITA TUFF (OLIGOCENE) – Three local ash flows of biotite-hornblende-plagioclase quartz latite with minor quartz and sanidine containing about 50 percent phenocrysts.

Tbc — BACHELOR MOUNTAIN AND CARPENTER RIDGE TUFFS (OLIGOCENE) – Crystal-poor rhyolite ash-flow tuff; in part streaked and layered by secondary flow. Locally compositionally zoned upward into crystal-rich biotite-hornblende quartz latite. Bachelor caldera.

Tcl — TUFF OF CRYSTAL LAKE (OLIGOCENE) – Crystal-poor rhyolite ash-flow tuff containing 10-15 percent phenocrysts, mostly of biotite, plagioclase, and sanidine.

Tfg — FISH CANYON TUFF AND OUTLET TUNNEL MEMBER OF LA GARITA TUFF (OLIGOCENE; 27.8 m.y.) – Ash-flow tuff of biotite-hornblende-plagioclase quartz latite with minor quartz and sanidine containing about 50 percent phenocrysts. Sparse resorbed quartz and accessory sphene phenocrysts are distinctive. La Garita caldera.

Tmp — TUFF OF MASONIC PARK (OLIGOCENE; 28.2 m.y.) – Biotite-pyroxene-plagioclase quartz latite ash-flow tuff containing 50-60 percent phenocrysts. Mount Hope caldera.

TREASURE MOUNTAIN TUFF (OLIGOCENE; 29.8 m.y.):

Ttu — Upper member, Ra Jadero Member, Ojito Creek Member, and middle member – Upper and middle members consist of heterogeneous air-fall and local ash-flow tuffs. Ra Jadero and Ojito Creek Members are biotite-pyroxene-plagioclase quartz latite ash-flow tuffs containing 10-15 percent phenocrysts. Summitville caldera.

Ttj — La Jara Canyon Member – Biotite-pyroxene-plagioclase quartz latite ash-flow tuff containing 20-40 percent phenocrysts. Platoro caldera.

Ttl — Lower member – Heterogeneous air-fall and local ash-flow tuffs.

Trc — TUFF OF ROCK CREEK (OLIGOCENE) – Dark-red-brown quartz latite ash-flow tuff containing conspicuous lenses of black scoria. Phenocrysts are plagioclase biotite.

INTERMEDIATE TO SILICIC LAVAS AND RELATED ROCKS

SILICIC ROCKS ASSOCIATED WITH THE LAKE CITY CALDERA (MIOCENE; 22.5 m.y.):

Tsl — Lavas – Coarsely porphyritic quartz latite and rhyolite flows containing prominent sanidine phenocrysts.

Tsi — Volcanic neck and shallow intrusives – Volcanic neck of altered quartz latite at Red Mountain, and local masses of granite porphyry containing large sanidine phenocrysts elsewhere.

Tcr — VOLCANICS OF SOUTH MOUNTAIN AND CROPSY RIDGE (MIOCENE; 20.2-23 m.y.) – Coarsely porphyritic quartz latite and rhyolite flows containing phenocrysts of quartz, plagioclase, sanidine, and sparse biotite and hornblende.

Tcd — CREEDE FORMATION (OLIGOCENE) – Stream, lake, and pyroclastic deposits containing widespread travertine within Creede caldera.

Tf — FISHER QUARTZ LATITE (OLIGOCENE; 26.4 m.y.) – Coarsely porphyritic biotite-hornblende-augite rhyodacite, quartz latite (predominant), and rhyolite flows and breccias around margin of Creede caldera.

Tbd — QUARTZ LATITE OF BALDY CINCO (OLIGOCENE) – Predominantly coarsely porphyritic quartz latite flows and breccias.

Trp — QUARTZ LATITE OF RAMBOUILLET PARK (OLIGOCENE) – Predominantly coarsely porphyritic quartz latite flows and breccias.

Tsp — VOLCANICS OF STEWART PEAK (OLIGOCENE) – Porphyritic rhyodacite, quartz latite, and rhyolite flows and breccias within San Luis caldera. Some rhyolite flows consist largely of perlite.

Ttm — VOLCANICS OF TABLE MOUNTAIN (OLIGOCENE) – Finely to coarsely porphyritic rhyodacite and quartz latite flows and breccias.

Tsc — SHALLOW CREEK QUARTZ LATITE (OLIGOCENE) – A large volcanic dome of biotite-hornblende quartz latite; some related breccias and small flows.

Tq — NUMEROUS LOCAL FLOWS AT MANY STRATIGRAPHIC POSITIONS (OLIGOCENE) – Varied rhyodacite, quartz latite, and rhyolite flows and breccias; most are finely to coarsely porphyritic.

Tgr — VOLCANICS OF GREEN RIDGE (OLIGOCENE) – Mostly flows and breccias of coarsely porphyritic biotite-augite or biotite-hornblende quartz latite and rhyodacite from volcanic centers around north and east sides of Platoro caldera. Volcaniclastic sediments derived from these centers are locally abundant.

Tlp — LOS PINOS FORMATION (PLIOCENE TO OLIGOCENE) – Mostly reworked bedded conglomerates, sandstones, and mudflow breccias containing rhyodacite and quartz latite clasts derived from volcanics of Green Ridge (Tgr) and Cropsy Ridge (Tcr). Includes thin beds of ash-fall and nonwelded ash-flow tuff.

Tlc — QUARTZ LATITE OF LEOPARD CREEK (OLIGOCENE) – Moderately to coarsely porphyritic biotite-hornblende quartz latite and rhyolite flows and breccias.

INTRUSIVE ROCKS

Tiy — INTRUSIVE ROCKS EMPLACED DURING PERIOD OF ASH-FLOW ERUPTIONS (OLIGOCENE) – Heterogeneous hypabyssal intrusive rocks consisting of equigranular to coarsely porphyritic gabbro, diorite, granodiorite, monzonite, and quartz monzonite, and fine-grained rocks of equivalent compositions.

Tio — INTRUSIVE ROCKS EMPLACED DURING PERIOD OF EARLY INTERMEDIATE ERUPTIONS (OLIGOCENE AND OLDER?) – Hypabyssal intrusive rocks consisting of equigranular to moderately porphyritic syenogabbro, granodiorite, and quartz monzonite and fine-grained rocks of equivalent compositions.

TKi — INTRUSIVE ROCKS OF THE LA PLATA, RICO, AND OURAY CENTERS (PALEOCENE AND UPPER CRETACEOUS) – Heterogeneous hypabyssal intrusive rocks with a wide range in textures and compositions. Predominantly fine-, medium-, and locally coarse-grained equigranular to porphyritic diorite-monzonite, granodiorite, quartz monzonite, syenite, and granite, and fine-grained rocks of equivalent compositions.

Ti — INTRUSIVE ROCKS (AGE OF EMPLACEMENT NOT KNOWN) – Heterogeneous intermediate to silicic hypabyssal intrusive rocks with a wide range in textures and compositions.

VOLCANIC SEQUENCE IN WESTERN SAN JUAN MOUNTAINS

INTERMEDIATE LAVAS AND PYROCLASTIC ROCKS

Theb — HENSON AND BURNS FORMATIONS (OLIGOCENE) – Interbedded dark aphanitic to coarsely porphyritic and amygdaloidal andesitic to rhyodacitic flows and flow breccias, and greenish-gray fine-grained water-laid tuffs, overlying thin-bedded to massive rhyodacitic and quartz latitic domes, lava flows, and flow breccias. Porphyritic rocks are pyroxene-bearing in upper part and amphibole-bearing in lower part. Contains local tuffs, welded ash-flow tuffs, and lakebed shales and limestones.

ASH-FLOW UNITS

Tsd — SAPINERO MESA, EUREKA, AND DILLON MESA TUFFS (OLIGOCENE) – Sapinero Mesa Tuff is a compositionally zoned outflow sheet of ash-flow tuff ranging from moderately crystal-rich quartz latite in upper part and near the source, to crystal-poor rhyolite in lower part and away from source. The Eureka Tuff is the intracaldera equivalent of the Sapinero Mesa Tuff, and is found only within the San Juan and Uncompahgre calderas. The Dillon Mesa Tuff is crystal-poor rhyolite containing fine-grained phenocrysts that locally underlies the outflow Sapinero Mesa Tuff. All units contain plagioclase, sanidine, biotite, and minor quartz and pyroxene phenocrysts.

Tbm — BLUE MESA TUFF (OLIGOCENE) – Crystal-poor rhyolite ash-flow tuff containing 10-15 percent phenocrysts of plagioclase, sanidine, and biotite. Locally compositionally zoned upward into more crystal-rich quartz latite.

Tur — TUFF OF UTE RIDGE (OLIGOCENE) – Crystal-rich rhyolitic ash-flow tuff containing 20-60 percent phenocrysts of plagioclase, sanidine, and biotite. Locally includes a crystal-poor rhyolite ash-flow tuff at the base.

SEDIMENTARY ROCKS

Tsbt — SAN JOSE FORMATION, BLANCO BASIN FORMATION, AND TELLURIDE CONGLOMERATE (EOCENE) – San Jose Formation consists of light-gray to brown arkosic sandstone and conglomerate interbedded with red, brown, and light-gray claystone and sandstone; maximum thickness about 2,500 feet. Blanco Basin Formation is largely arkose, arkosic mudstone, sandstone, conglomerate, and red, yellow, and white claystone; maximum thickness about 750 feet. Telluride Conglomerate contains light-gray to red conglomerate, grit, and sandstone, and lesser quantities of mudstone and shale; maximum thickness about 1,000 feet.

Tn — NACIMIENTO FORMATION (PALEOCENE) – Gray and varicolored shale and gray to yellow sandstone; maximum thickness about 500 feet.

Tsn — SAN JOSE AND NACIMIENTO FORMATIONS (EOCENE AND PALEOCENE).

TKa — ANIMAS FORMATION (PALEOCENE AND UPPER CRETACEOUS) – Dark varicolored sandstone, shale, and conglomerate; contains abundant volcanic and arkosic detritus; maximum thickness about 2,700 feet.

Kam — McDermott Member (Upper Cretaceous) – Reddish-brown to purple sandstone, breccia, conglomerate, and shale containing abundant volcanic detritus.

TKsa — SAN JOSE, NACIMIENTO, AND ANIMAS FORMATIONS (EOCENE, PALEOCENE, AND UPPER CRETACEOUS).

TKba — BLANCO BASIN AND ANIMAS FORMATIONS (EOCENE, PALEOCENE, AND UPPER CRETACEOUS).

TKna — NACIMIENTO AND ANIMAS FORMATIONS (PALEOCENE AND UPPER CRETACEOUS).

Kk — KIRTLAND SHALE (UPPER CRETACEOUS) – Mostly shale, sandy shale, and sandstone; maximum thickness about 1,200 feet.

Kku — Upper shale member – Sandy shale and light-gray sandstone; maximum thickness about 500 feet.

Kkf — Farmington Sandstone Member – Light-gray sandstone; beds of greenish-gray shale; maximum thickness about 350 feet.

Kkl — Lower shale member – Dark-gray shale; minor sandstone, carbonaceous shale, and coal; maximum thickness about 400 feet.

Kkp — KIRTLAND, FRUITLAND, AND PICTURED CLIFFS FORMATIONS (UPPER CRETACEOUS).

Kf — FRUITLAND FORMATION (UPPER CRETACEOUS) – Lenticular beds of sandstone, shale, and coal; maximum thickness about 400 feet.

Kpc — PICTURED CLIFFS SANDSTONE (UPPER CRETACEOUS) – Light-gray sandstone interbedded with dark-gray shale in lower part; maximum thickness about 300 feet.

Kl — LEWIS SHALE (UPPER CRETACEOUS) – Dark-gray clay shale; contains thin sandstone beds near top, and rusty-weathering concretions in lower part; maximum thickness about 2,700 feet.

Kch — CLIFF HOUSE SANDSTONE (UPPER CRETACEOUS) – Gray calcareous sandstone, argillaceous sandstone, mudstone, and silty shale; maximum thickness about 350 feet.

Kmf — MENEFEE FORMATION (UPPER CRETACEOUS) – Light-gray sandstone, siltstone, and shale, and beds of coal; maximum thickness about 350 feet.

Kpl — POINT LOOKOUT SANDSTONE (UPPER CRETACEOUS) – Light-gray to yellowish-gray sandstone and interbedded siltstone and shale in lower part; maximum thickness about 400 feet.

Kmv — MESAVERDE FORMATION (UPPER CRETACEOUS) – Interbedded thin sandstone and dark-gray clay shale; minor carbonaceous shale and coal; maximum thickness about 350 feet.

Klmv — LEWIS AND MESAVERDE FORMATIONS (UPPER CRETACEOUS).

Km — MANCOS SHALE (UPPER CRETACEOUS) – Mostly dark-gray marine shale; maximum thickness about 2,400 feet.

Kmu — Upper part – Contains calcareous shale and argillaceous limestone (Niobrara Formation equivalent) in lower 600 feet, and has sandy limestone and argillaceous sandstone (Juana Lopez Member) at base; maximum thickness about 1,900 feet.

Kml — Lower part – Contains thin calcareous shale and limestone (Greenhorn Limestone equivalent) in lower 150 feet; maximum thickness about 500 feet.

Kd — DAKOTA SANDSTONE (UPPER CRETACEOUS) – Light-gray to brown sandstone with interbedded siltstone and carbonaceous shale; commonly contains chert pebble conglomeratic sandstone at base; maximum thickness about 200 feet.

Kdb — DAKOTA SANDSTONE AND BURRO CANYON FORMATION (UPPER AND LOWER CRETACEOUS) – Dakota Sandstone disconformably overlies Burro Canyon Formation, a lenticular chert-pebble conglomerate interlayered with green and gray claystone; maximum thickness of unit about 300 feet.

Jm — MORRISON FORMATION (UPPER JURASSIC) – Brushy Basin Member is mostly varicolored claystone and mudstone; it overlies the Salt Wash Member, which is mostly sandstone with interbedded claystone and mudstone; maximum thickness about 800 feet.

Jw — WANAKAH FORMATION (UPPER JURASSIC) – In the San Juan Basin, the Junction Creek Sandstone Member (upper) is light-gray crossbedded sandstone, the middle member is limy shale, siltstone, and sandstone; the basal Pony Express Limestone Member is dark-gray bituminous limestone that locally contains gypsum. In the northwest part of the quadrangle, an upper marl member consists of calcareous claystone, siltstone, and sandstone; the Bilk Creek Sandstone Member is fine-grained thin-bedded sandstone, the basal Pony Express Limestone Member is dark-gray bituminous limestone. Maximum thickness about 300 feet.

Je — ENTRADA SANDSTONE (UPPER JURASSIC) – Light-gray crossbedded sandstone; maximum thickness about 250 feet.

Jmw — MORRISON AND WANAKAH FORMATIONS (UPPER JURASSIC).

Jme — MORRISON, WANAKAH, AND ENTRADA FORMATIONS (UPPER JURASSIC) – Burro Canyon Formation (Lower Cretaceous) included at top in San Miguel River drainage.

Jwe — WANAKAH AND ENTRADA FORMATIONS (UPPER JURASSIC).

TRd — DOLORES FORMATION (UPPER TRIASSIC) – Mostly nonmarine red shale, siltstone, sandstone, and limestone-pebble conglomerate; maximum thickness about 600 feet.

JTRmd — MORRISON, WANAKAH, ENTRADA, AND DOLORES FORMATIONS (UPPER JURASSIC AND UPPER TRIASSIC).

Pc — CUTLER FORMATION (LOWER PERMIAN) – Mostly nonmarine red shale, siltstone, mudstone, and arkosic grit and conglomerate; maximum thickness about 2,000 feet.

PIPrm — RICO, HERMOSA, AND MOLAS FORMATIONS (LOWER PERMIAN AND PENNSYLVANIAN) – Rico Formation (Lower Permian and Pennsylvanian) consists of nonmarine red beds of shale, siltstone, arkosic sandstone, and grit; it represents transitional beds between the Cutler and Hermosa Formations, and throughout much of the area is not readily recognizable as a distinct map unit; maximum thickness about 350 feet. Hermosa Formation (Pennsylvanian) west of Los Pinos River is largely dark-gray marine shale, limestone, and sandstone; east of the river, west-pointing tongues of nonmarine red shale, siltstone, mudstone, and arkosic grit increase in number and thickness eastward; maximum thickness about 2,500 feet. Molas Formation (Pennsylvanian) is mostly nonmarine shale, siltstone, sandstone, conglomerate, and basal red breccia; maximum thickness about 125 feet.

Ml — LEADVILLE LIMESTONE (LOWER MISSISSIPPIAN) – Light- to dark-gray dense to coarsely crystalline limestone and dolomitic limestone; minor intercalated red shale, siltstone, and sandstone; locally cherty; commonly contains limestone breccia in lower part; maximum thickness about 180 feet.

Doe — OURAY LIMESTONE AND ELBERT FORMATION (UPPER DEVONIAN) – Ouray Limestone is light gray, dense to finely crystalline, locally dolomitic; maximum thickness 150 feet; overlies Elbert Formation, which consists of varicolored calcareous shale, limestone, quartzitic sandstone, and siltstone; maximum thickness 100 feet.

PDre — RICO, HERMOSA, MOLAS, LEADVILLE, OURAY, AND ELBERT FORMATIONS (LOWER PERMIAN, PENNSYLVANIAN, LOWER MISSISSIPPIAN, AND UPPER DEVONIAN).

MDle — LEADVILLE, OURAY, AND ELBERT FORMATIONS (LOWER MISSISSIPPIAN AND UPPER DEVONIAN).

Ꞓi — IGNACIO QUARTZITE (UPPER CAMBRIAN) – Light-gray quartzitic sandstone and siltstone; locally conglomeratic in lower part; maximum thickness 50 feet.

MꞒli — LEADVILLE, OURAY, ELBERT, AND IGNACIO FORMATIONS (LOWER MISSISSIPPIAN, UPPER DEVONIAN, AND UPPER CAMBRIAN).

METAMORPHIC AND IGNEOUS ROCKS

p€uc — MELASYENITE OF UTE CREEK (PRECAMBRIAN Y) – Green to dark-gray massive nearly homogeneous seriate inequigranular hornblende-biotite melasyenite.

p€tr — TRIMBLE GRANITE (PRECAMBRIAN Y) – Pale-red massive commonly porphyritic fine- to medium-grained biotite granite.

p€el — ELECTRA LAKE GABBRO (PRECAMBRIAN Y; 1,460 m.y.) – Medium- to dark-gray massive heterogeneous medium- to coarse-grained gabbro, augite-hornblende diorite, biotite-augite quartz diorite, and granodiorite.

p€e — EOLUS GRANITE (PRECAMBRIAN Y; 1,460 m.y.) – Predominantly pink to brick-red massive homogeneous porphyritic biotite-hornblende quartz monzonite; lesser mafic granodiorite, biotite quartz monzonite, and biotite granite.

p€c — GRANITE OF CATARACT GULCH (PRECAMBRIAN Y) – Red massive coarse-grained homogeneous biotite quartz monzonite and granodiorite.

p€pr — QUARTZ DIORITE OF PINE RIVER (PRECAMBRIAN Y) – Gray massive medium- to coarse-grained homogeneous biotite-hornblende-augite quartz diorite.

p€us — UNCOMPAHGRE FORMATION (PRECAMBRIAN) – Aggregates about 8,000 feet thick: Slate – Gray, green, and black slate, phyllite, and schist. Less metamorphosed rocks commonly contain abundant organic carbon and pyrite; more metamorphosed rocks consist of muscovite, quartz, and biotite, with minor andalusite, chloritoid, garnet, and staurolite.

p€uq — Quartzite – Light-gray to pale-blue thick- to thin-bedded quartzite containing a few thin layers of quartz pebble conglomerate and sericitic siltstone.

p€t — TENMILE GRANITE (PRECAMBRIAN X; 1,720 m.y.) – Pink to light-gray foliated medium- to coarse-grained biotite granodiorite and quartz monzonite; pervasively stained, partly recrystallized and locally well foliated.

p€b — BAKERS BRIDGE GRANITE (PRECAMBRIAN X; 1,700 m.y.) – Pale-red massive medium- to coarse-grained granite; contains abundant perthite, less than 10 percent plagioclase, and complexly altered hornblende and biotite.

p€tw — TWILIGHT GNEISS (PRECAMBRIAN X; 1,800 m.y.) – Largely fine- to medium-grained quartzo-feldspathic gneiss and scattered layers of dark fine-grained amphibolite, probably metamorphosed dacite and basalt.

p€i — IRVING FORMATION (PRECAMBRIAN X) – Metavolcanic and metasedimentary rocks consisting of interlayered amphibolite, plagioclase-bearing gneiss, quartzite, minor iron-formation, and biotite and muscovite schist.

p€v — VALLECITO CONGLOMERATE (PRECAMBRIAN X) – Gray thin- to thick-bedded metaconglomerate and quartzite; at least 2,400 feet and perhaps more than 5,000 feet thick.

Contact

Fault – *Bar and ball on downthrown side*

5000 — Structure contours, approximately located – *Drawn on base of Dakota Sandstone. Not shown where control is lacking. Contour interval 500 feet, with supplementary contours at 250 feet locally. Structure contours are shown only in southwestern part of quadrangle (San Juan Basin area).*

Anticline

Syncline

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VESTERN COLORADO

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