DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
84-274

Base from U. S. Geological Survey, 1:24,000
Byers Peak (1957), Loveland Pass (1958), Ute Peak (1980)

Geology by P. K. Theobald, R. R. Carlson, and R. G. Eppinger, 1979-1982

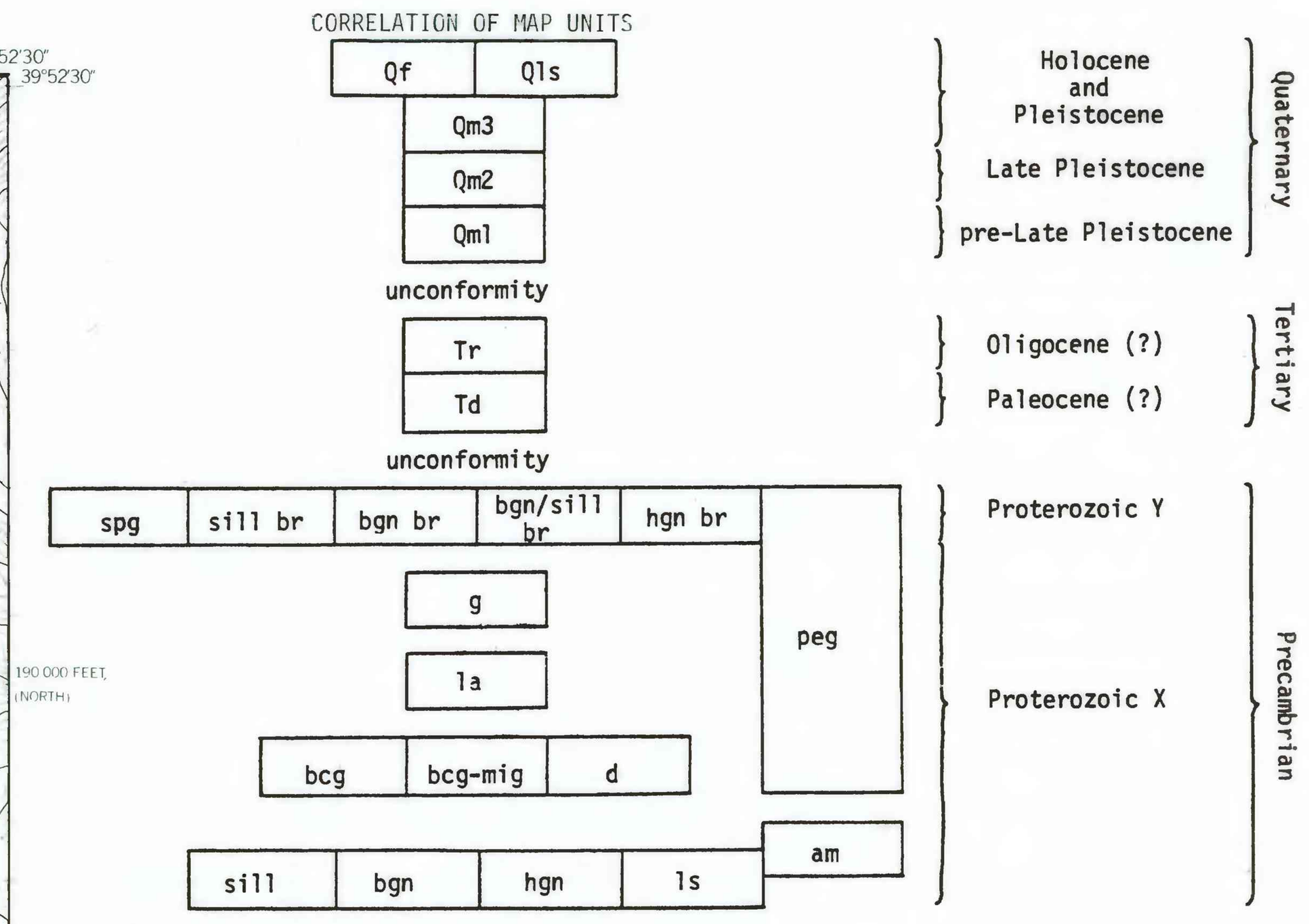
SCALE 1:24 000

CONTOUR INTERVAL 40 FEET

Location Map

QUADRANGLE INDEX

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

A discussion of the local geologic setting is found in Eppinger, Theobald, and Carlson (in press).

Qf	ALLUVIAL FAN DEPOSITS (HOLOCENE AND PLEISTOCENE)--Relatively small, fan-shaped bodies of poorly sorted silt, sand and gravel. Surface strewn with coarse, angular blocks. Confined to the change-in-slope between gently sloping valley bottoms and steeper valley walls
Qls	LANDSLIDE DEPOSITS (HOLOCENE AND PLEISTOCENE)--Landslides composed of rock and soil debris. Common along oversteepened sides of valleys. Only the larger landslides are shown
Qm3	ROCK GLACIERS AND BLOCK STREAMS (HOLOCENE AND PLEISTOCENE)--Relatively small bodies of boulders and angular blocks; generally lacking fine material and vegetation; generally ice-cored. Large bodies are lobate with arcuate ridges at toes. Only the larger bodies are shown
Qm2	GLACIAL TILL (LATE PLEISTOCENE)--Unsorted bouldery to sandy till of both Pinedale and Bull Lake age. Younger deposits locally exhibit well-developed glacial morphology. Covered by abundant vegetation
Qml	SLUMPED REGOLITH (PRE-LATE PLEISTOCENE)--Periglacially deformed regolith occurring on gentle slopes flanking ridgetops, generally above the highest moraines on valley walls. Surface commonly displays geomorphic forms related to freeze-thaw phenomena. Saprolite occurs locally in the substrate
Tr	RHYOLITE DIKES (OLIGOCENE?)--Small, fine-grained, commonly silicified dikelike bodies distributed mainly along the Continental Divide north and south of Jones Pass. Locally exhibit porphyritic texture and(or) flowbanding and(or) jasperoid veins
Td	AUGITE DIORITE DIKES (PALEOCENE?)--Fine-grained, mafic dikes locally containing plagioclase and augite phenocrysts. Age uncertain, but older than mineralization associated with Tertiary rhyolite and younger than Silver Plume Granite. Assignment to the Tertiary follows Lovering (1935)
spg	SILVER PLUME GRANITE (PRECAMBRIAN Y)--Light-colored, fine- to coarse-grained, seriate porphyritic muscovite-biotite quartz monzonite[1] with trachytoid texture formed by microcline phenocrysts, but locally equigranular. About 1.4 b.y. old
sill br	SILVER PLUME GRANITE AND SILLIMANITE GNEISS (PRECAMBRIAN Y)--Composed of Silver Plume Granite rich in inclusions of sillimanite gneiss, with little evidence of chemical interaction and apparently only slight rotation of the inclusions. Locally an intrusion breccia
bgn br	SILVER PLUME GRANITE AND BIOTITE GNEISS (PRECAMBRIAN Y)--Composed of Silver Plume Granite rich in inclusions of biotite gneiss, with little evidence of chemical interaction and apparently only slight rotation of the inclusions. Locally an intrusion breccia
bgn/sill br	SILVER PLUME GRANITE AND BIOTITE AND SILLIMANITE GNEISSES (PRECAMBRIAN Y)--Composed of Silver Plume Granite rich in inclusions of both the biotite gneiss and sillimanite gneiss
hgn br	SILVER PLUME GRANITE AND HORNBLENDE GNEISS (PRECAMBRIAN Y)--Composed of Silver Plume Granite rich in inclusions of hornblende gneiss, with little evidence of chemical interaction and apparently only slight rotation of the inclusions. Locally an intrusion breccia
peg	PEGMATITE (PRECAMBRIAN Y AND X)--Small, light-gray and pinkish-gray muscovite-rich pegmatitic masses and dikes. Probably of two or more ages, but not separated in the field. Only the larger bodies are shown
g	GABBRO (PRECAMBRIAN X)--Massive to well-foliated, medium-grained leucogabbro composed chiefly of plagioclase with lesser amounts of pyroxene, hornblende, and biotite. Prominent thermal metamorphic aureole exhibits large garnet and rosettes of large sillimanite crystals that disrupt older foliation. About 1.7 b.y. old (Tweto, 1980) although it intrudes the Boulder Creek Granodiorite (Taylor, 1975) and is younger than regional metamorphism
la	LAMPROPHYRE (PRECAMBRIAN X)--Irregular masses and dikes composed chiefly of hornblende, biotite, feldspar, and quartz; porphyritic
bcg	BOULDER CREEK GRANODIORITE (PRECAMBRIAN X)--Well-foliated, medium- to coarse-grained biotite quartz monzonite to quartz diorite. Locally contains inclusions of biotite gneiss and migmatite. Foliation is parallel to that in the enclosing gneisses. About 1.7 b.y. old
bcg-mig	BOULDER CREEK GRANODIORITE AND BIOTITE GNEISS (PRECAMBRIAN X)--Boulder Creek Granodiorite with interlayered biotite gneiss; locally migmatitic
d	QUARTZ DIORITE (PRECAMBRIAN X)--Dark, massive to well-foliated, medium- to coarse-grained, hornblende quartz diorite. Intimately associated with the Boulder Creek Granodiorite. Only the larger bodies are shown
am	AMPHIBOLITE (PRECAMBRIAN X)--Pods of weakly- to moderately-foliated amphibolite containing hornblende and plagioclase. Generally conformable with surrounding metamorphic rocks, although dikes occur locally. Only the larger bodies are shown
sill	SILLIMANITE GNEISS (PRECAMBRIAN X)--Coarsely layered sequence of medium- to coarse-grained sillimanite-muscovite-quartz-biotite gneiss, and quartz-biotite gneiss that ranges to plagioclase-quartz-biotite gneiss and quartzite. Sillimanite commonly segregated into quartz-sillimanite "eyes" oriented along foliation
bgn	BIOTITE GNEISS (PRECAMBRIAN X)--Well-foliated, fine- to medium-grained gneiss, ranging from a biotite-quartz-plagioclase-sillimanite gneiss to a biotite-quartz gneiss containing subordinate sillimanite and feldspar. Sillimanite occurs as fine-grained, disseminated crystals aligned on foliation planes, and is difficult to resolve megascopically. Foliation is usually parallel to layering. Locally migmatitic
hgn	HORNBLENDE GNEISS (PRECAMBRIAN X)--Medium-grained, hornblende-quartz-plagioclase gneiss. Generally occurs as an interlayered unit with biotite and calc-silicate gneisses; the layering is generally more conspicuous than foliation. Locally exhibits a salt-and-pepper texture on weathered surface
ls	CALC-SILICATE GNEISS (PRECAMBRIAN X)--Fine- to medium-grained gneiss, ranging from diopside-rich gneiss to marble, with layering generally more conspicuous than foliation

FAULT OR SHEAR ZONE--Zones of shattered rock and (or) abundant gouge, usually altered and coated with iron oxides. Approximately located, dashed where inferred

CONTACT--Approximately located

CATACLASIZED ROCK AND MYLONITE

STRIKE AND DIP OF FOLIATION
Inclined
Vertical

SHAFT

ADIT

PROSPECT

ACCESS ROAD FOR THE DENVER WATER BOARD AQUEDUCT

REFERENCES

Eppinger, R. G., Theobald, P. K., and Carlson, R. R., in press, Generalized geologic map of the Vasquez Peak Wilderness Study Area, and the Williams Fork and St. Louis Peak Roadless Areas, Clear Creek, Grand, and Summit Counties, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-1588B, scale 1:50,000.

Lovering, T. S., 1935, Geology and ore deposits of the Montezuma quadrangle, Colorado: U.S. Geological Survey Professional Paper 178, 119 p.

Taylor, R. B., 1975, Geologic map of the Bottle Pass quadrangle, Grand County, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-1224, scale 1:24,000.

Tweto, Ogden, 1980, Geologic map of Colorado: U.S. Geological Survey, scale 1:500,000.

[1] The minerals in composite rock names are arranged in order of decreasing amounts; i.e., a muscovite-biotite quartz monzonite is a quartz monzonite containing more muscovite than biotite.

PRELIMINARY GEOLOGIC MAP OF THE WESTERN AND SOUTHERN PARTS OF THE BYERS PEAK, THE NORTHWESTERN PART OF THE LOVELAND PASS, AND THE EASTERN PART OF THE UTE PEAK 7 1/2-MINUTE QUADRANGLES, CLEAR CREEK AND GRAND COUNTIES, COLORADO

By
R. G. Eppinger, P. K. Theobald, and R. R. Carlson

1984