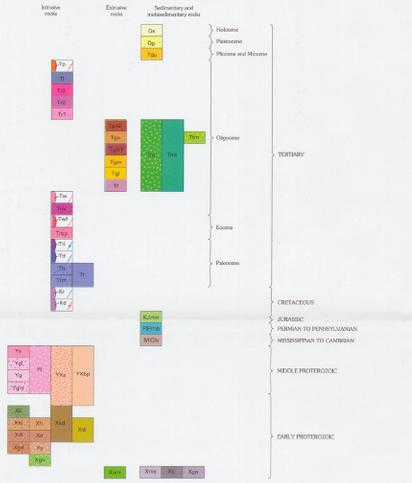
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I-2565
Pamphlet accompanies map

CORRELATION OF MAP UNITS



LIST OF MAP UNITS

[See accompanying text pamphlet for detailed descriptions of map units]

- Qs — Surficial deposits (Holocene)
- Qg — Glacial deposits (Pleistocene)
- Tdu — Dry Union Formation (Pliocene and Miocene)
- Rock units of the Grizzly Peak caldera
  - Tp — Post-resurgent plutons (Oligocene)
  - Resurgent plutons
    - Tri — Late-resurgent plutons (Oligocene)
    - Oldest resurgent plutons
      - Tri3 — Youngest plutons (Oligocene)
      - Tri2 — Intermediate-age plutons (Oligocene)
      - Tri1 — Oldest plutons (Oligocene)
  - Grizzly Peak Tuff
    - Tgtu — Upper heterogeneous subunit (Oligocene)
    - Tgu — Upper rhyolite subunit (Oligocene)
    - Tgtl — Lower heterogeneous subunit (Oligocene)
    - Tgm — Middle rhyolite subunit (Oligocene)
    - Tgl — Lower rhyolite subunit (Oligocene)
  - Caldera-Collapse Breccia
    - Tgbm — Megabreccia (Oligocene)
    - Tgbc — Clast-supported tuff megabreccia (Oligocene)
    - Tgbm — Matrix-supported tuff megabreccia (Oligocene)
  - Tr — Precaldera rhyolite lava (Oligocene)
  - Tw — Intrusive rocks of the White Rock pluton (Oligocene)
  - Tin — Intrusive rocks of the Italian Mountain intrusive complex (Oligocene)
  - Twf — Felsic plutons and dikes of Winfield Peak and Middle Mountain (Eocene)
  - Tmp — Intrusive rocks of the Mount Princeton pluton (Eocene)
  - Intrusive rocks of the Twin Lakes pluton
    - Tt — Intermediate-composition porphyry dikes (Paleocene)
    - Ttf — Felsic porphyry dikes (Paleocene)
    - Tt — Main body (Paleocene)
    - Ttl — Leucocratic core (Paleocene)
    - Ttm — Mafic border (Paleocene)
  - Kr — Quartz porphyry, granite, and aplite (Cretaceous)
  - Kd — Dioritic intrusive rocks (Cretaceous)
  - KJmn — Mancos Shale through Entrada Sandstone, undivided (Upper Cretaceous through Middle Jurassic)
    - Mancos Shale (Upper Cretaceous)
    - Dakota Sandstone (Lower Cretaceous)
    - Morrison Formation (Upper Jurassic)
    - Entrada Sandstone (Middle Jurassic)
  - PPmb — Maroon Formation through Belden Formation, undivided (Lower Permian through Pennsylvanian)
    - Maroon Formation (Lower Permian to Middle Pennsylvanian)
    - Gothic Formation (Middle Pennsylvanian)
    - Belden Formation (Middle and Lower Pennsylvanian)
  - MCn — Leadville Limestone through Sawatch Quartzite (Lower Mississippian through Upper Cambrian)
    - Leadville Limestone (Lower Mississippian)
    - Castle Butte Cliff Member
    - Red Cliff Member
    - Chaffee Group (Lower Mississippian? and Upper Devonian)
      - Gilman Sandstone (Lower Mississippian to Upper Devonian)
      - Dyer Dolomite (Upper Devonian)
      - Parting Formation (Upper Devonian)
    - Fremont Limestone (Upper Ordovician)
    - Harding Sandstone (Middle Ordovician)
    - Manitou Dolomite (Lower Ordovician)
    - Peerless Formation (Upper Cambrian)
    - Sawatch Quartzite (Upper Cambrian)
  - Yg — St. Kevin Granite (Middle Proterozoic)
  - Intrusive rocks of the Grottos pluton
    - Ygl — Leucocratic bodies (Middle Proterozoic)
    - Yg — Main body (Middle Proterozoic)
    - Ygm — Mafic border (Middle Proterozoic)
  - Yt — Granite of Taylor River (Middle Proterozoic)
  - Yvbx — Granodiorite of Sayers (Middle or Early Proterozoic)
  - YXbp — Browns Pass Granite (Middle or Early Proterozoic)
  - Xk — Keystone Granodiorite (Early Proterozoic)
  - Intrusive rocks of the Henry Mountain pluton
    - Xrd — Leucocratic granite bodies (Early Proterozoic)
    - Xh — Granite of Henry Mountain (Early Proterozoic)
  - Intrusive rocks of the Denny Creek pluton
    - Xdl — Leucocratic bodies (Early Proterozoic)
    - Xd — Main body of Denny Creek Granodiorite (Early Proterozoic)
    - Xdd — Keystone Granodiorite and Denny Creek Granodiorite, undivided (Early Proterozoic)
  - Xd — Dioritic (Early Proterozoic)
  - Xgd — Gneissic granodiorite (Early Proterozoic)
  - Xy — Granite of Mount Yale (Early Proterozoic)
  - Xgb — Gabbro and Metagabbro (Early Proterozoic)
  - Xam — Amphibolite (Early Proterozoic)
  - Xms — Metasedimentary gneiss (Early Proterozoic)
  - Xq — Metasedimentary gneiss and quartzite (Early Proterozoic)
  - Xgn — Mixed gneiss, mica schist, and gneissic granite (Early Proterozoic)

Contact—Dashed where approximately located. In the Grizzly Peak Caldera, the lack of a contact indicates a gradation between the two map units

Fault—Dashed where approximately located; dotted where concealed. Arrow and number indicate dip of fault plane; tick and number 90 indicate vertical fault

Normal—Bar and ball on downthrown side

Thrust—Teeth on upper plate

Shear zone

Strike and dip of bedding
- Inclined
- Vertical
- Overturned

Strike and dip of joints
- Inclined
- Vertical

Strike and dip of tectonic foliation
- Inclined
- Vertical

Lineation—Showing bearing and plunge. May be combined with tectonic foliation symbols

Approximate trend of variable attitudes

Minor folds, showing plunge

Strike and dip of igneous flow foliation
- Inclined
- Vertical

Strike and dip of compaction foliation in welded tuff
- Horizontal
- Inclined

Anticline, showing plunge

Syncline, showing plunge

Overturned syncline

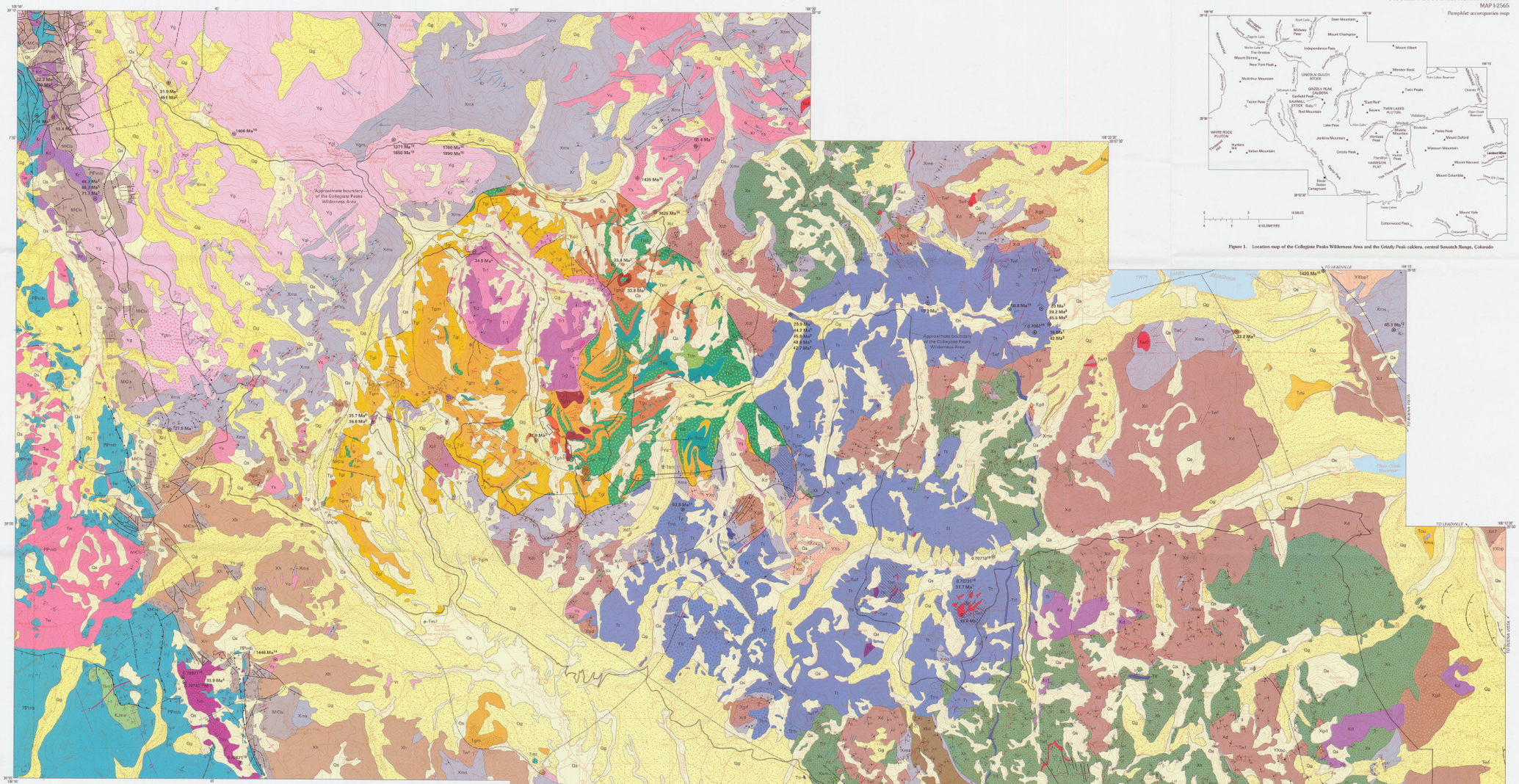
Brecciated zones adjacent to Twin Lakes pluton

Altered zones
- Iron-stained, quartz-pyrite veinlets; propylitic assemblage at Winfield
- Quartz-sericite-pyrite
- Quartz-sericite; phyllic assemblage at Winfield
- Potassium feldspar-quartz assemblage at Winfield

32.3 Ma[5] — Geochronologic sample locality—Superscript number keyed to source of data in Table 1

Sample locality for chemical analysis of dike—Chemical analyses permit certainty of assignment to map unit. Dikes without this symbol are inferred to belong to map unit on the basis of petrography

Approximate boundary of Collegiate Peaks Wilderness Area


Approximate boundary of the Collegiate Peaks Wilderness Area
TO LEADVILLE
TO BUENA VISTA
TO GUNNISON
INDEPENDENCE PASS
Clear Creek Reservoir
Twin Lakes Reservoir
Turquoise Lake
Tennyson Mtn
Mount Sheridan
Mount Huxley
Mount Democrat
Mount Lincoln
Mount Bross
Mount Cameron
Mount Sherman
Mount Elbert
Mount Massive
Mount Harvard
Mount Columbia
Mount Yale
Mount Oxford
Missouri Mountain
Huron Peak
Pacific Peak
Rockdale
Winfield
Hancock
Leadville
Twin Lakes
Granite
Nathrop
Buena Vista
Cottonwood Pass
Tomichi Creek
Taylor River
Lake Fork
Lake Creek
Roaring Fork
Frenchman Creek
Cache Creek
Chalk Creek
Chaffee County
Lake County
Gunnison County
Pitkin County
Fremont County
Park County
Lake County
Chaffee County
Gunnison County
Pitkin County
Lake County
Chaffee County
Fremont