Compilation Geologic map of the Ray-Superior area, Central Arizona

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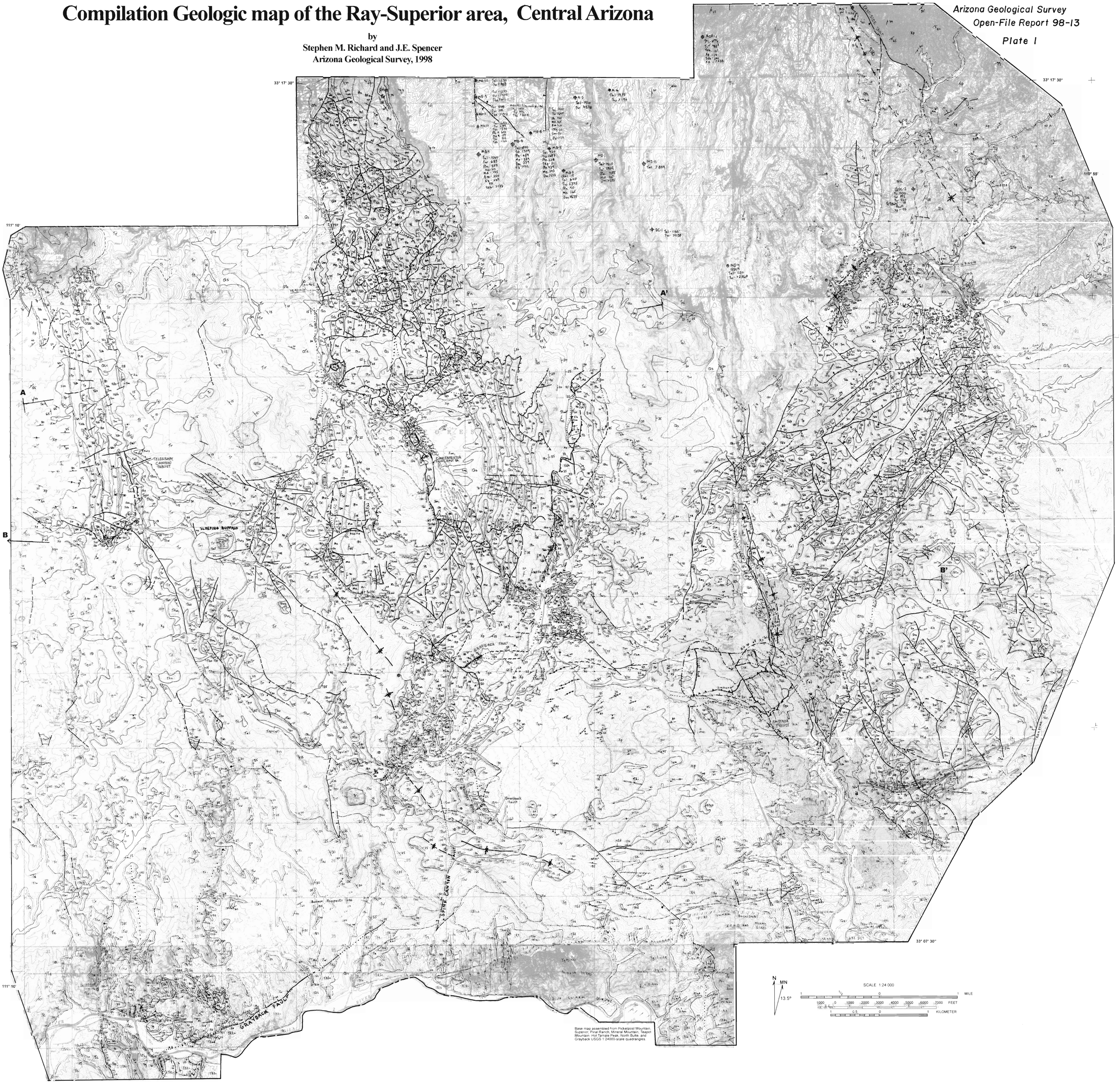
Arizona Geological Survey, 1998

Arizona Geological Survey
Open-File Report 98-13
Plate 1



Map Units

Qs Surficial deposits (Quaternary) -- Undivided surficial deposits

Qal Active alluvium (Holocene) -- Non-indurated sand and gravel in active stream channels

Qtc Talus and colluvium (Holocene and Pleistocene) -- Unconsolidated talus and colluvium on slopes

Qoa Older surficial deposits (Middle Pleistocene to Late Pliocene) -- Old alluvium on terraces and pediments

QTal Apache Leap tuff-boulder deposits (Holocene to Pliocene) -- Cobbles to blocks of Apache Leap Tuff in a matrix of sandy clay

QTls Landslide deposits (Quaternary or Pliocene) -- Mud to large boulders transported by mass wasting, characterized by hummocky surface

QTs Basin Fill (Pleistocene to Late Miocene) -- Undivided alluvium (Qal), old alluvium (Qoa), and conglomerate (Tc)

Middle Tertiary volcanic and sedimentary rocks (Miocene to Eocene(?)) --

Tc Conglomerate (Miocene)-- Massive conglomerate with thin sandstone lenses.
- Tci Granite clast facies
- Tcc Paleozoic carbonate clast facies

Tbs Tuff and volcanic-lithic sandstone (Miocene) -- Basaltic volcanic-lithic sandstone, white tuff, tan sandstone

Tb Basalt, upper unit (Late Miocene to Middle Miocene) -- Very fine-grained basalt lava flows

Volcanic Rocks of Picketpost Mountain (Miocene)

Tri Felsic intrusive rocks -- Massive rhyolite to rhyodacite, typically with quartz, feldspar, and sparse biotite crystals in a very-fine grained, light-colored groundmass

Tr Felsic volcanic rocks -- Rhyolite to dacite lava flows, with associated vitrophyre, autobreccia, and tuff

Trst Pinal schist-clast tuff -- Lithic rhyolite tuff containing abundant clasts of Pinal Schist

Ttw Tuff of White Canyon -- White to light gray, bedded tuff with sparse conglomerate horizons

Tbo Basaltic rocks (Miocene) -- Dark gray basalt, basalt or andesite lava flows, typically vesicular, and associated with red, scoriaceous deposits

TKmd Basaltic hypabyssal intrusive rocks (Miocene or Cretaceous) -- Small intrusions of dark gray, fine-grained to aphanitic basalt or andesite

Tgw Gravel of Walnut Canyon (Middle Miocene) -- Gray to buff conglomeratic strata, ranging from sandy conglomerate to sedimentary breccia

Tgx Sedimentary breccia -- monolithologic breccia, letter in parenthesis indicates source rock type: (t) - Apache Leap tuff, (g) - granite

Tal Apache Leap Tuff (Early Miocene) -- Pink to orange, crystal-rich welded tuff, phenocrysts of plagioclase, quartz, biotite, sanidine, and hornblende

- - - - - cooling break -- Non-resistant bed in tuff forms ledge visible from a distance

v v v v v vitrophyre-- Black vitrophyre at base of welded tuff

Tw Whitetail Formation (Early Miocene to Eocene(?)) -- Conglomerate, sandstone, shale

Twc conglomerate, carbonate clast -- Massive conglomerate, clasts dominantly Paleozoic formations

Twp conglomerate, Pinal schist-clast -- Massive, angular clast, monolithologic conglomerate consisting of Pinal Schist clasts.

Twe gypsum and mudstone -- Buff siltstone to mudstone with associated gypsum or anhydrite.

Tws fine-grained member -- Light gray to red brown laminated mudstone with interbedded fine-grained sandstone

Tx Sedimentary breccia (Early Miocene to Eocene) -- Shattered rock and monolithologic breccia deposits. Letter in parenthesis indicates source rock type: (p) Pinal Schist, (a) Apache group and Lower Paleozoic strata

Tch Chaos (Miocene or Oligocene) -- Tectonically mixed units of such complexity that relationships cannot be shown on the map

Laramide Igneous rocks (Eocene to Late Cretaceous) --

Tfd Felsite (Paleocene) -- Light-colored felsite dikes, phenocrysts mostly plagioclase, minor biotite or hornblende present, quartz is sparse, aphanitic groundmass.

Ttm Teapot Mountain Porphyry (Paleocene) -- Salt and pepper gray, granitic porphyry, contains characteristic K-feldspar phenocrysts up to 3 cm diameter.

Trp Rhyolite (Paleocene) -- Dikes related to Teapot Mountain Porphyry, large K-feldspar phenocrysts, up to about 3 cm long are distinctive

Trd Rhyodacite (Paleocene) -- White, cream and tan felsic dikes characterized by prominent quartz phenocrysts and lack of K-feldspar phenocrysts.

Tap Aplite and pegmatite (Paleocene) -- Aplite and pegmatite dikes associated with Granite Mountain Porphyry

Tgm Granite Mountain Porphyry (Paleocene) -- Texturally variable equigranular granodiorite to granite porphyry

TKap Aplite and pegmatite (Paleocene to Late Cretaceous) -- Aplite and pegmatite dikes spatially associated with Tea Cup granodiorite.

TKtc Tea Cup Granodiorite (Paleocene) -- Equigranular, medium-grained, leucocratic granitoid

TKd Dark rhyodacite porphyry (Paleocene to Cretaceous) -- Dark-colored dikes characterized by 5-15 mm diameter plagioclase and quartz phenocrysts

TKi Dacite (Paleocene to Late Cretaceous) -- Crystal rich dikes in which quartz and K-feldspar phenocrysts are sparse or absent.

Kt Tortilla Quartz diorite (Late Cretaceous) -- Fine-grained, equigranular quartz diorite

Ktgd Granodiorite phase (Late Cretaceous) -- Equigranular, fine-grained granodiorite phase, lighter color, more quartz than main phase

Kd Diorite and diorite porphyry (Late Cretaceous) -- Texturally variable, fine-grained, equigranular diorite and diorite porphyry

Kbx Breccia (Late Cretaceous) -- Fragments of volcanic rocks, diorite, Pinal Schist and granite in a matrix similar to diorite porphyry (Kd) groundmass

Pre-Laramide rocks (Paleozoic to Early Proterozoic) --

IPn Naco Formation (Pennsylvanian) -- Ledge-forming fossiliferous limestone, sandstone and marl.

Me Escabrosa Limestone (Mississippian) -- Gray to blue-gray massive crystalline limestone

Dm Martin Formation (Late Devonian) -- Medium-bedded brown, gray and tan dolomite and dolomitic limestone

Cb Bolsa Quartzite (Middle Cambrian) -- Maroon-gray feldspathic sandstone

Ya Apache Group, Troy Quartzite, and diabase (Middle Proterozoic) -- Undivided diabase, Apache Group, and Troy Quartzite

Ydb Diabase (Middle Proterozoic) -- Dark gray, fine-grained dikes and sills with typical diabasic texture

Yt Troy Quartzite (Middle Proterozoic) -- Medium- to coarse-grained and grit-sized, moderately to poorly sorted, locally massive quartzite

Ya Apache Group (Middle Proterozoic) --
- Yb basalt -- Gray, black or brown basalt lava flow or flows
- Ym Mescal Limestone -- Medium-bedded, tan to white dolomite or limestone, locally very cherty
- Yds Dripping Spring Quartzite -- Feldspathic to arkosic quartzite, sandstone, minor shale
- Yp Pioneer Formation -- Reddish brown sandstone, siltstone and minor shale with distinctive light gray reduction spots

Yg Coarse-grained, porphyritic biotite granite -- Light brown to light gray porphyritic biotite granite with 2-8 cm diameter K-feldspar phenocrysts

XYgp Granite and schist (Middle Proterozoic and Early Proterozoic) -- Zones of biotite granite (Yg) with abundant, partially resorbed inclusions of Pinal schist

Xm Madera Diorite (Early Proterozoic) -- Diorite, quartz diorite, granodiorite; generally massive except for foliation developed near contacts

- Xm_2 Equigranular biotite granodiorite -- Equigranular, fine- to medium-grained biotite granodiorite
- Xm_1 Quartz diorite -- Medium-grained, medium to dark gray, biotite-hornblende quartz diorite

Xp Pinal Schist (Early Proterozoic) -- Tan to bluish-gray, fine-grained, quartz-muscovite-chlorite ± biotite semi-schist to phyllite

SYMBOLS

FOLIATION; strike and dip

Broken and wavy lines may be used to indicate approximate measurements or curvoplanar foliation in conjunction with any symbol

Primary foliation

BEDDING

upright vertical overturned irregular approximate

FLOW FOLIATION

flow banding in lavas or hypabyssal intrusions, eutaxitic foliation in welded tuffs, igneous flow foliation in plutons

Tectonic foliations

Generic metamorphic foliation

APPARENT DIP

Trace of bedding on cliffs or steep slopes

MAJOR FOLDS

HINGE PLANE TRACE, AND PLUNGE DIRECTION OF FOLD

Syncline

CONTACTS

Solid lines indicate precise location, dashed lines approximate location, dashed with queries very approximate, and dotted inferred beneath younger blanketing or intrusive units.

intrusive or depositional contact

gradational contact

FAULTS

HIGH ANGLE (ball on down-thrown side, arrow indicates dip, box arrow indicates orientation of slickenside striations)

LOW ANGLE (barbs on hanging wall)

thrust

low-angle, nature uncertain

low-angle normal fault

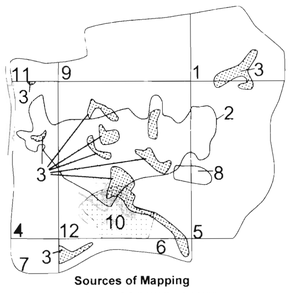
MISCELLANEOUS

Tie line joining regions underlain by same map unit

Geochronology sample locations.

Well locations

Quartz veins



Sources of Mapping

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