

Rolling Stones Gem & Mineral Society: Geology Field Trip Highway 61 (Mimbres Valley) – January 4, 2020

Introduction: The geologic history of New Mexico can be summarized as three episodes:

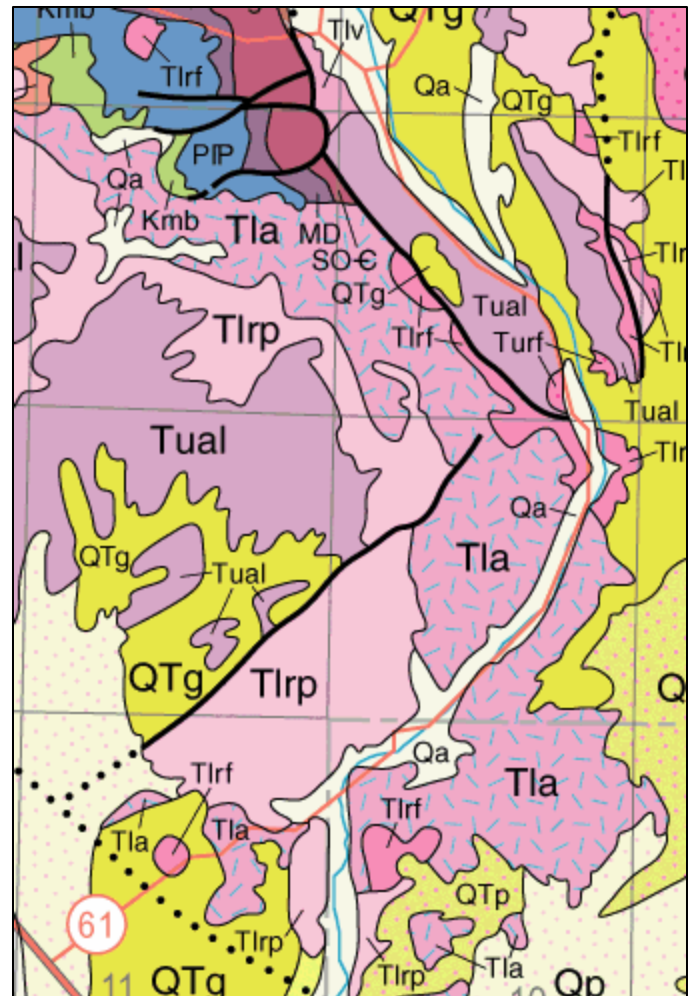
- Proterozoic Era (1800 – 1400 million years ago): Assembly of North America.
 - Igneous and metamorphic rocks formed as bits were added to the southern margin of the continent by plate tectonics.
- Paleozoic and Mesozoic Eras (500 – 66 million years ago): Stable continental region.
 - Sedimentary rocks deposited as seas advanced and retreated across the area.
- Cenozoic (66 million years ago to the present): Shaping the modern landscape.
 - Volcanism and faulting from plate tectonic activity on the western margin of North America.

Highway 61 follows the Mimbres Valley from Highway 180 to Highway 152. All of the rocks exposed along the highway are volcanic rocks of Cenozoic age ranging from 40 about million years old to 26 million years of age. The southern part of the area was mapped by Wolf Elston in the early 1950's and he was probably the first geologist to recognize that many of these rocks were deposited by flows of ash, pumice and hot gas.

The goal of this field trip will be to look at the variation that is found in these volcanic rocks. In general most of these rocks can be described using the relative amounts of 4 components.

- Crystals: usually feldspar, quartz and some Fe-Mg minerals like hornblende.
- Rock Fragments: broken pieces of rock incorporated into the magma. Usually angular and variable in size.
- Pumice fragments: Pumice is light and not very strong, so when present often appears as thin, wispy gray streaks where the pumice had collapsed.
- Ash: all the fine-grained material.

The composition of the rocks in the Mimbres Valley range from rhyolite to basaltic andesite. Rhyolite is usually, but not always, light in color and rich in silica (quartz is abundant). Basaltic andesite is usually darker in color and contains far less silica (not much quartz)



Q (yellow) – Late Cenozoic gravels, Qa is alluvium in river valleys
T (pink) – Cenozoic (Tertiary) volcanic rocks
Tual: 26 – 29 million years old
Tlrp: 31-36 million years old
Tla: 33 – 43 million years old
SO-C, MD, PP, K (darker colors at top of map) – Paleozoic and Mesozoic sedimentary rocks

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Road log:

Note – my odometer and the mile markers on Highway 61 are not in agreement. The mileage given is based on my odometer reading, if near a mile marker the mileage is shown in parentheses.

Miles

- 0.0 Junction of Highway 180 and Highway 61. Drive north on Highway 61.
- 2.0 Faywood Hot Springs.
- 3.0 Entrance to City of Rocks State Park.
- 3.5 **STOP 1:** Overview and volcanic rock. The rock here is primarily a fine, gray ash with rare, dark crystals of amphibole and biotite.
- 6.6 **STOP 2: Pull off on the left side of the highway.**
The giants of the Mimbres. Erosional remnants of an ash-flow sheet like at City of Rocks. These are on private land and so not accessible. Walk north along the highway to the outcrops. The rock here is a tan-weathering, white ash with abundant rock fragments, quartz and feldspar crystals and collapsed pumice.
- 8.0 Dwyer Road.
- 8.6 **STOP 3:** Green volcanic ash that contains abundant rock fragments, but few crystals.
- 10.8 Faywood Post Office
- 13.6 **STOP 4:** Basaltic andesite. Very dark in color. Crystals of amphibole and pyroxene in a fine groundmass. (MM 14)
- 14.5 **STOP 5:** Dike. The vertical dike is harder than the surrounding rock and so creates a ridge. (MM15)
- 17.8 **STOP 6: Pull off on the left side of the highway.**
Spherulites. The spherulites are composed of radial growth of quartz and feldspar and often form as a volcanic glass begins to devitrify (crystallize, therefore no longer glass).
- 18.4 **STOP 7:** Rhyolite flows that are very dark in color, very fine-grained with very thin layers. (MM19)
- 18.8 Royal John Road.
- 19.5 Cenozoic gravels form the valley walls on the western side of the river.
- 24.2 Junction Highway 61 and 152. End of trip.

Reference: Elston, Wolfgang, 1957, Geology and Mineral Resources of Dwyer Quadrangle, Grant, Luna, and Sierra Counties, New Mexico: NM Bureau of Geology and Mineral Resources, Bulletin 38, 86p.

(<https://geoinfo.nmt.edu/publications/monographs/bulletins/38/>)