GEOLOGIC MAP OF THE SOUTHERN HIEROGLYPHIC MOUNTAINS, CENTRAL ARIZONA

by

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INTRODUCTION

This reconnaissance geologic map covers both the Baldy Mountain and the Hieroglyphic Mountains SW 7.5 minute quadrangles of central Arizona. The geologic mapping was done between January and June, 1986 and November and December, 1987. This mapping was jointly funded by the U. S. Geological Survey and the Arizona Bureau of Geology and Mineral Technology as part of the cost-sharing, Cooperative Geologic Mapping Program (COGEOMAP). The aim of COGEOMAP is to produce high-quality geologic maps for areas that have been inadequately mapped and that have high mineral resource or natural potential.

This mapping was done on 1:24,000-scale topographic maps and on 1:24,000-scale color aerial pholographs provided by Raymond A. Brady, U. S. Bureau of Land Management, Phoenix. The reader is referred to a previous report on the northeastern Hieroglyphic Mountains (Capps, R.C., and others, 1986) for a more detailed discussion of the geology of the region. Additional descriptions of the area are contained in Ward (1977). Rock-unit names in this report are from Stimac and others (1987) and Capps and others (1986) as modified from Ward (1977).

MAP-UNIT DESCRIPTIONS

Qy — UNCONSOLIDATED SEDIMENTARY DEPOSITS-(HOLOCENE)--Poorly sorted to well-sorted sand, silt, and gravel in active drainages. These deposits are especially conspicuous by sparse or no vegetation cover.

Qy_1 — UNCONSOLIDATED SEDIMENTARY DEPOSITS-(HOLOCENE)--Poorly sorted sand, silt, and gravel that underlie flood-plain terraces 1 to 3 m above active drainages.

Qt — TALUS-(QUATERNARY)--Unconsolidated pebbles, boulders, and cobbles along the base of hills and ridges formed by resistant map units, especially some of the younger basalt flows (map unit Tbu) in the southeastern portion of the map.

Qal — PARTLY CONSOLIDATED SEDIMENTARY DEPOSITS-(QUATERNARY)--Poorly sorted sand- to cobble-sized material on pediment surfaces and other areas of low relief and along drainages where recent incision is not severe. This unit also includes relatively thick soils developed on gently dipping erosional surfaces on upper basalt flows (map unit Tbu).

QTs — SANDSTONE, SILTSTONE, AND CONGLOMERATE, UNDIVIDED-(LATE MIOCENE TO QUATERNARY)--Consolidated to partly consolidated sedimentary rocks that flank bedrock exposures; includes pediment developed on Proterozoic schist (map unit Xs) fans and plains of alluvium considered to be basin fill. Thin soil horizons developed on alluvium are probably Quaternary in age, and substantially younger than gently dipping, underlying material.

Tf — FANGLOMERATE AND SANDSTONE-(MIOCENE)--Consolidated to partly consolidated sedimentary rocks dominated by clast- and matrix-supported conglomerate that unconformably overlies the upper basalt flows (Tbu). Stratigraphically lowest beds in this unit dip steeply to the east, whereas higher beds are progressively less tilted. The youngest beds, which are exposed along the western bank of the Agua Fria River, are flat-lying. About 10 to 20m of section of tilted rocks in the northern part of the map area (section 25, T7N, R1W) consist of a well-bedded sequence of arkosic sandstone and matrix supported conglomerate. Beds are typically 20cm thick, but range from 5 to 40 cm. These deposits are inferred to be mostly sheetflood deposits predominated by debris flows and hyperconcentrated flood-flows. Clasts are typically subangular, up to 4cm in diameter, and locally imbricated.

Tbu BASALT FLOWS-(MIDDLE MIOCENE)--Vesicular, dark-gray-weathering, resistant, plagioclase-clinopyroxene-olivine-phyric basalt with an aphyric groundmass. Phenocrysts include approximately 15% olivine and clinopyroxene and 5% plagioclase. Olivine is conspicuous as it alters to iddingsite, and clinopyroxene occurs as euhedral, light-green prisms that locally cleave with an iridescent coating. Plagioclase occurs as colorless, euhedral, singular grains up to 3mm long. Olivine is locally associated with clinopyroxene in glomeroporphyritic aggregates less than 3mm across.

Tdf DEBRIS FLOWS-(MIDDLE MIOCENE)--Several tens of meters of yellowish-colored, non-resistant, poorly bedded, matrix-supported conglomerate overlain by sandstone and conglomerate, which are locally clast-supported. Clasts are mostly angular and dominantly vesicular, basaltic rocks. Sandstones are bedded on the scale of 20-30cm. The upper contact with the overlying basalt is sharp, whereas the the lower contact with the underlying tuffaceous rocks (map unit Tt) is a 10 to 15^{o} angular unconformity.

Th HELLS GATE VOLCANICS-(MIOCENE)--Strongly rhyodacitic or dacitic flow rock with phenocrysts of biotite, hornblende, and plagioclase. This unit contrasts with rhyolites of either Spring Valley (map unit Ts) or Morgan City (map unit Tcm) in that this unit lacks sanadine phenocrysts and its abundant hornblende phenocrysts. Phenocryst assemblage includes approximately 3% plagioclase feldspar and 1% hornblende, as well as 1/2% biotite. Groundmass is aphyric. Plagioclase content locally increases upsection to at least 10% and some grains are as much as 1cm across, although most commonly grains are 3-4mm across.

Tmc MORGAN CITY RHYOLITE-(MIOCENE)--Crystal-poor rhyolite intrusions with sparse phenocrysts of sanadine and biotite; unit is quite similiar texurally and mineralogically Spring Valley rhyolite (map unit Ts).

Ts SPRING VALLEY RHYOLITE-(MIOCENE)--Light-tannish-green-weathering, purple- or gray-colored, conspicuously flow-foliated rhyolite flows and intrusions with less than 5% phenocrysts of biotite and sanadine. Sanadine occurs as discrete, subhedral, 1 to 2mm-long phenocrysts. Biotite, in various stages of oxidation, occurs as 1-to-2mm-thick books or plates. Quartz-coated fractures are abundant in many exposures, as are thin seems of vapor-phase alteration and lithophysae.

Tt TUFFACEOUS ROCKS-(MIOCENE)--Very light-gray, fine-grained, consolidated and unconsolidated, locally welded tuffaceous rocks including poorly sorted, lithic-rich lapilli tuff, well-sorted ash, and lithic-poor lapilli tuffs. Thinly bedded to laminated tuff locally includes abundant lithic fragments of sand-sized material, which is probably reworked from pyroclastic rocks like those common in the northern part of the map area. Some horizons consist of only ash and probably represent air-fall tuffs. Ignimbrites exposed immediately south of Morgan City Wash have phenocrysts of biotite, plagioclase, and quartz, and the pebble-sized accidental fragments.

Tbl BASALT FLOWS-(MIOCENE)--Dark reddish-brown-weathering, nonresistant, olivine-phyric basalt with 10 to 15% fine- to medium-grained phenocrysts. This map unit is substantially less resistant than the upper basalt flows (Tbu) and does not exhibit the flow fronts. Talus is poorly developed around the low hills. The older basalt flows are also more steeply tilted than the those of the upper basalt. Some basalt flows of this unit contain quartz as 1-2mm rounded grains without any apparent reaction rim. Tiny calcite stringers and amygdules are also present locally. Unit is locally interbedded with tuffaceous rocks of unit Tt, and locally includes some 10- to 20-m-thick sections of well-preserved mafic pyroclastic rocks beneath Saddleback Mountain, in section 35, T6N, R1W.

Xg PORPHYRYTIC GRANITOID-(PROTEROZOIC)--Biotite-bearing granitoid with conspicuous megacrysts of potassium feldspar locally more than 1cm across.

Xs SCHIST-(PROTEROZOIC)--Includes several fine- to medium-grained metamorphic mineral assemblages including, chlorite-quartz-plagioclase, amphibole-quartz-plagioclase, quartz-plagioclase-K-feldspar, quartz-muscovite, quartz magnetite, and muscovite-biotite-quartz. Generally non-resistant but quartz- or chert-rich lithology are very often underlie precipitous ridges.

Xbi BANDED IRON FORMATION-(PROTEROZOIC)--Lenticular bodies of interbedded chert, iron oxide, phyllite, carbonate, and metavolcanic rocks, ranging in width from 15 to 100 m and rarely more than 350 m in length (Slatt and others, (1978).

SYMBOLS

STRIKE AND DIP OF BEDDING

STRIKE OF VERTICAL BEDDING

HORIZONTAL BEDDING

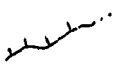
STRIKE AND DIP OF FOLIATION

STRIKE OF VERTICAL FOLIATION

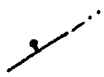
STRIKE AND DIP OF FOLIATION OR CLEAVAGE

STRIKE AND DIP OF SPACED CLEAVAGE

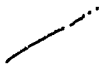
STRIKE OF VERTICAL CLEAVAGE



LOW-ANGLE NORMAL FAULT -- Dashed where approximately located, dotted where concealed; hachures on upper plate.



HIGH- TO MODERATE-ANGLE FAULT -- Dashed where approximately located, dotted where concealed; bar and ball on down-thrown block.



HIGH-ANGLE FAULT -- Dashed where approximately located, dotted where concealed.

FAULT DIP

RELATIVE SLIP DIRECTION OF FAULT

DIRECTION OF PEBBLE IMBRICATION IN FANGLOMERATE

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