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KMEMM06C1-C3

DEKALB Mining, Inc.

MEMO TO: File DATE: June 28, 1982

FROM: K. M. Emanuel

SUBJECT: Table Mountain Prospect Area (ERG Joint Venture Submittal), Pinal County, Arizona

Introduction

The Table Mountain prospect was evaluated during two visits; the first by myself on April 4, 1982, and again with G. A. Parkison on April 27, 1982. Field investigations consisted of surface and underground geologic examination in the vicinity of the old Table Mountain mine and detailed check sampling of a number of jasperoid bodies within the prospect area.

Discussions and Recommendations

The area is characterized by a number of thick jasperoidal horizons within the Escarbosa limestone (Mississippian) and at least one related feeder structure that trends roughly east-northeast. The bedding replacement type of jasperoid bodies are typically 10 to 20 feet thick, white to dark redish-brown in color, and show abundant multistage brecciations cemented by dark reddish jasper in the vicinity of feeder fault structures. Iron oxides are locally abundant on outcrops with secondary copper minerals also being common, although much more restricted in occurrence abundance. Minor amounts of bladed barite, calcite, and resinous vanadinite were also noted in dump materials. The sampling done to date generally parallels that done by ERG, and suggests that the best area of interest is in the area near the old workings. Two samples (F 84, F 89) of slightly altered limestone from the Table Mountain tunnel and its dump suggest that some anomalous gold values can be expected disseminated within the limestones below the jasperoids. This particular ediface however, is driven on a copper oxide bearing jasperoid and quickly passes into the hangingwall lithologies (sample F 84). As in the footwall zone, limestones are an untested target. This property appears to have some potential for a bulk tonnage, low grade Au deposit of medium size. Logistically, however, the property is less attractive as a 15+ mile drive over extremely primative road is required to reach the property. Half of this road would require major widening and regrading to get a drill rig on the property. (ERG's initial mapping and sampling program was done using helicopter access.) Further investigations or actions on NICOR's part do not seem warranted at this time, as exploration would be expensive and the potential for payoff only moderately good.

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Sample Descriptions

Sample #	Description
F 83	Same local as ERG 1815. Representative ore dump sample of copper oxide and iron oxide bearing jasperoid and jasper breccia. Clasts vary from banded white to greenish and reddish. Copper oxides equal 0.5% to 1.0%. Table Mountain mine adit. Most of dump and portal of adit in brecciated jasperoid and somewhat argillized jasperoidal limestone. Some copper oxides on dumps (<0.5%). all ppm Au 2.5 Ag 6.6 Cu 1.65% Pb 5700 Zn 261 As 7400 Sb 58
F 84	Same local as ERG 1811 through 1813. Random chip along back and ribs in Table Mountain adit from 60 feet to 120 feet from portal. Recrystallized gray to pinkish limestone with local reddish jasperoidal patches, minor local barite and calcite; spotty argillization and local iron oxides in vugs. Unit is porous to cavernous and contains copper oxides near contact with jasperoid at 60 feet from portal. Some brecciation noted. A few vugs lined by clear quartz crystals. A few very fine grained pyrites noted in jasperoid zones. Jarosite-like greenish yellow stain noted locally. Au 0.10 Ag <0.5 Cu 540 Pb 2970 Zn 770 As 5300 Sb 32
F 85	Same local as F 84 (ERG 1811 through 1813). Select grab, high grade ore dump from outside Table Mountain adit primarily dark brown or grayish-green brecciated jasperoid with 0.5 to 2.5% copper oxides as films and in matrix. Sample of dump is copper oxide stained argillized limestone and limestone breccia (slightly jasperoidal). Au 0.47 Ag <0.5 Cu 5.6 Pb 4790 Zn 6930 As 5300 Sb 32
F 86	C.O.S. Same local as ERG 1820 (?). Red to brownish-orange, multiple stage jasperoid breccia; abundant reddish-brown cryptocrystalline matrix with local abundant quartz pyramids in small vugs and lining fractures; copper oxides occur sporadically throughout outcrop. Au <0.02 Ag <0.5 Cu 770 Pb 340 Zn 190 As 160 Sb 1.2

F 87 C.O.S. Same local as ERG 4455. White locally banded jasperoid with minor iron oxides on surfaces and in vugs and quartz lined cavities. Very little brecciation noted. Zone is 1 to 3 m thick and is concordant with bedding.

Au <0.02 Ag <0.5 Cu 22 Pb 39 Zn 18 As 11 Sb 0.02

F 89 Sample recrystallized and locally iron oxide stained limestone on head of Table Mountain tunnel. Slightly select limestone from Table Mountain mine dump. Dark to light gray, fossiliferous and locally recrystallized limestone with minor iron oxides and hematite stains and rare barite.

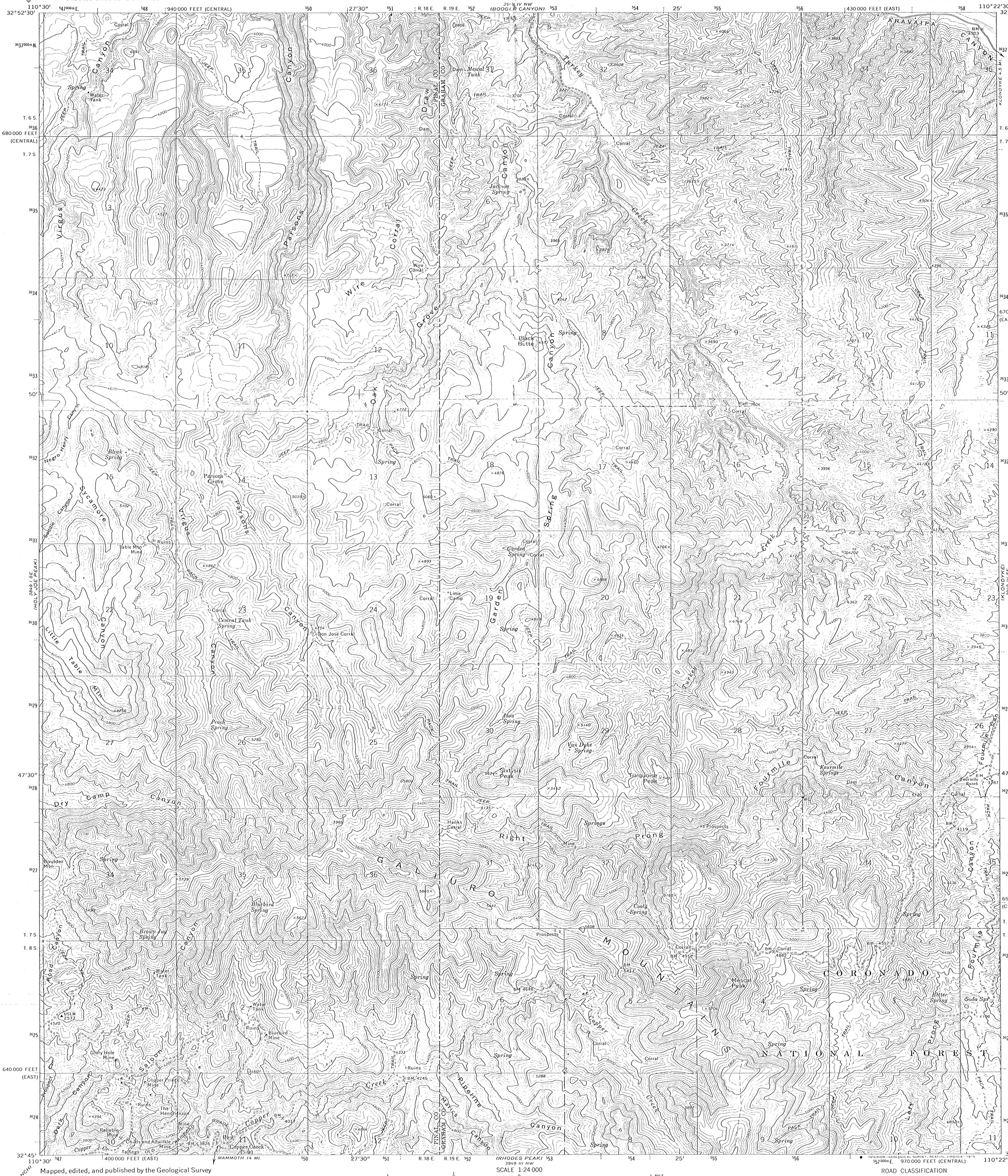
Au 0.08 Ag 0.2 Cu 15 Pb 45 Zn 385

F 90 C.O.S. Jasperoid outcrop. Same local as ERG 4454. White to reddish, slightly brecciated jasperoid limestone. A few secondary quartz lined vugs. Iron oxides occur dispersed in silica and as coatings on surfaces.

Au <.02 Ag 0.8 Cu 5 Pb 90 Zn 30

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OAK GROVE CANYON QUADRANGLE
ARIZONA
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 KLONDYKE 15' QUADRANGLE



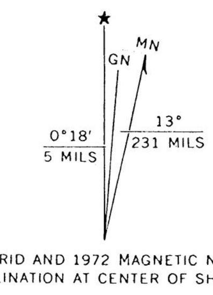
Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1971. Field checked 1972

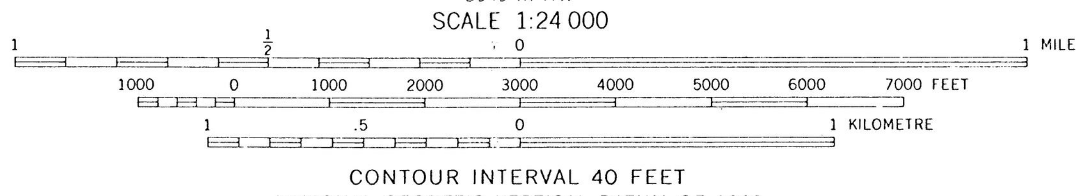
Projection: Arizona coordinate system, east zone (transverse Mercator)
10,000-foot grid ticks, based on Arizona coordinate system, east and central zones
1000-metre Universal Transverse Mercator grid ticks, zone 12, shown in blue. 1927 North American datum

Fine red dashed lines indicate selected fence lines



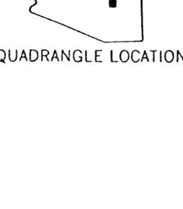
UTM GRID AND 1972 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000



CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



QUADRANGLE LOCATION

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1975

ROAD CLASSIFICATION

Primary highway, hard surface		Light-duty road, hard or improved surface	
Secondary highway, hard surface		Unimproved road	

Interstate Route U. S. Route State Route

OAK GROVE CANYON, ARIZ.
SW/4 KLONDYKE 15' QUADRANGLE
N3245—W11022.5/7.5

1972

AMS 3949 IV SW—SERIES V898

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OAK GROVE CANYON QUADRANGLE
ARIZONA
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 KLONDYKE 15' QUADRANGLE

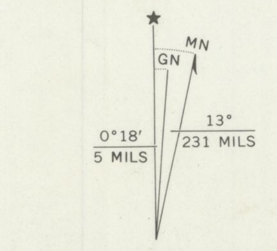
Mapped, edited, and published by the Geological Survey

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1971. Field checked 1972

Projection: Arizona coordinate system, east zone (transverse Mercator)
10,000-foot grid ticks, based on Arizona coordinate system, east and central zones
1000-metre Universal Transverse Mercator grid ticks, zone 12, shown in blue. 1927 North American datum

Fine red dashed lines indicate selected fence lines

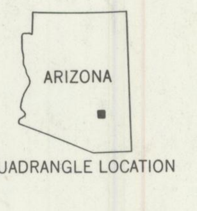


UTM GRID AND 1972 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETRE

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION

Primary highway, hard surface	Light-duty road, hard or improved surface
Secondary highway, hard surface	Unimproved road
Interstate Route	U. S. Route
State Route	

OAK GROVE CANYON, ARIZ.
SW/4 KLONDYKE 15' QUADRANGLE
N3245—W11022.5/7.5

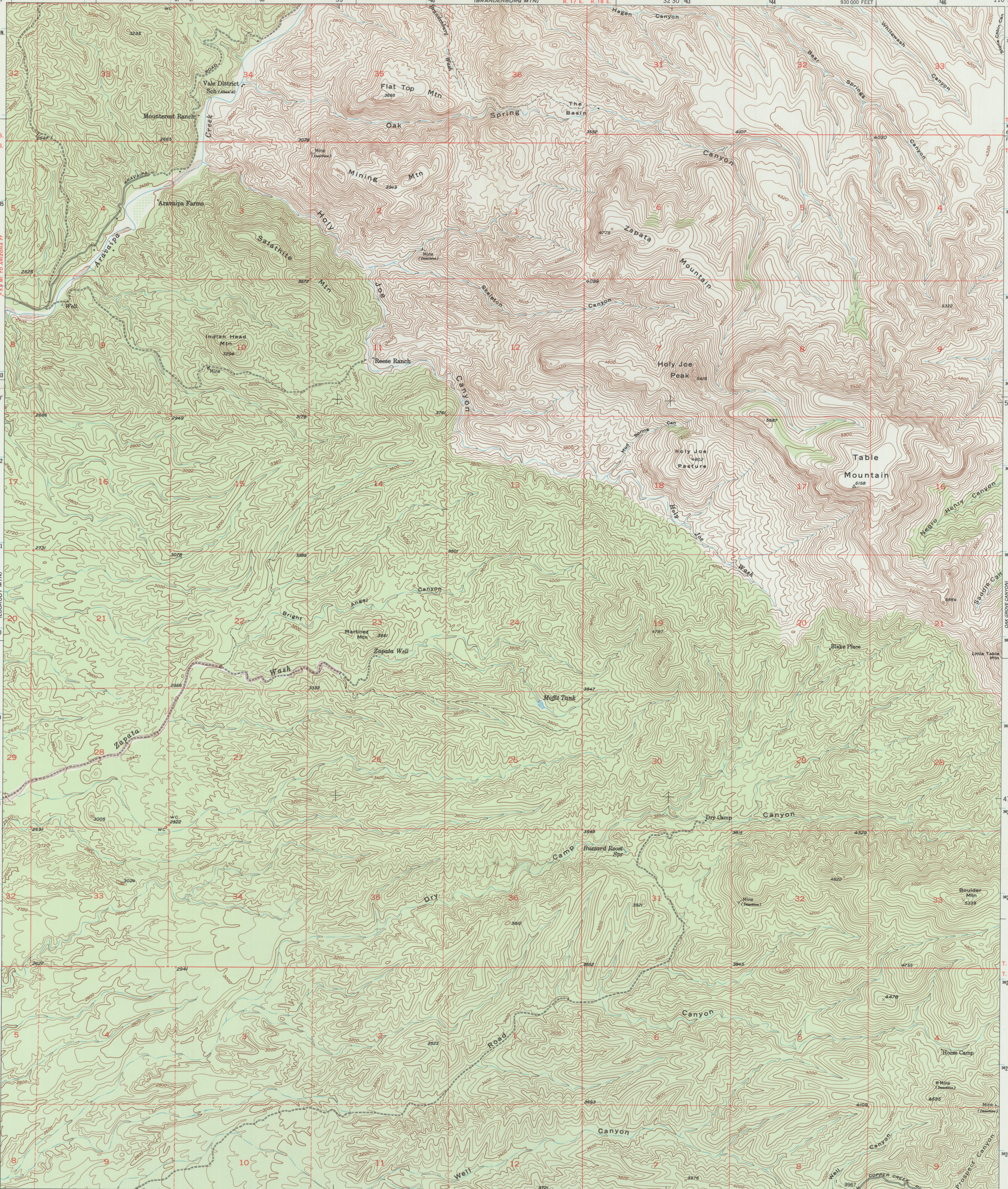
1972

AMS 3949 IV SW—SERIES V898

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

HOLY JOE PEAK QUADRANGLE
ARIZONA—PINAL CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SE/4 HOLY JOE PEAK 15' QUADRANGLE



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
Aerial photographs taken 1947. Field check 1949

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, central zone

Dashed land lines indicate approximate location

1000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

To place on the predicted North American Datum 1983 move the projection lines 4 meters south and 61 meters east as shown by dashed corner ticks

GN MN 0°14' 4 MILS 14° 249 MILS

UTM GRID AND 1949 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 MILE — 7000 FEET — 1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ARIZONA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
1963
Light-duty .... Unimproved dirt

Map photoinspected 1972
No major culture or drainage changes observed

HOLY JOE PEAK, ARIZ.
SE/4 HOLY JOE PEAK 15' QUADRANGLE
32110-G5-TF-024

1949
PHOTOINSPECTED 1972
DMA 3849 I SE–SERIES V898

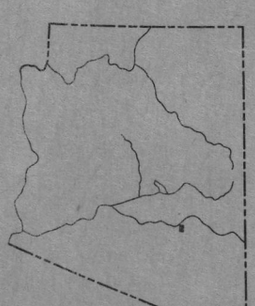
MAP GQ-668

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

GEOLOGIC QUADRANGLE MAPS OF THE UNITED STATES

GEOLOGIC MAP OF THE BRANDENBURG MOUNTAIN QUADRANGLE PINAL COUNTY, ARIZONA

By
Medora H. Krieger



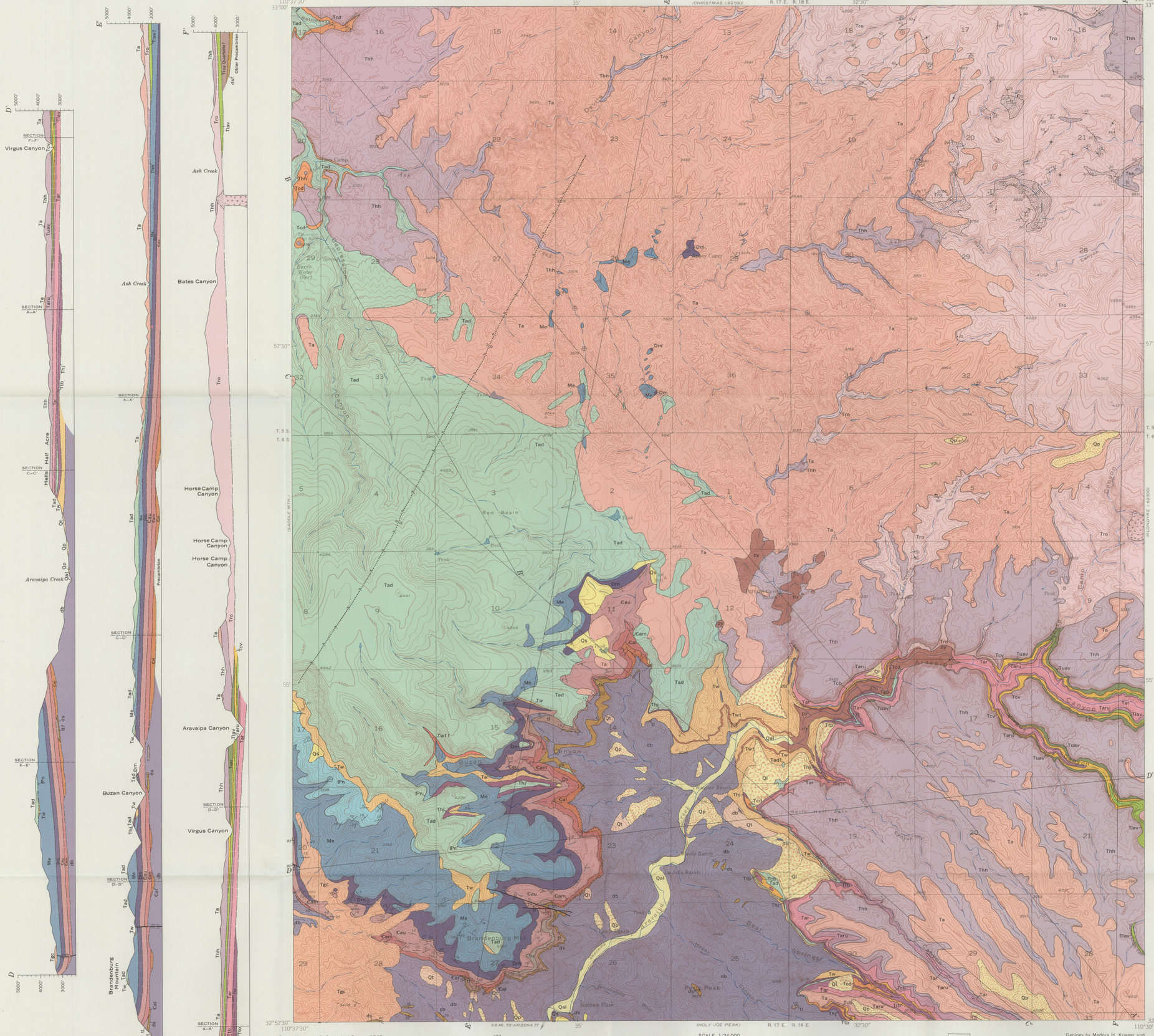
QUADRANGLE LOCATION

PUBLISHED BY THE U. S. GEOLOGICAL SURVEY
WASHINGTON, D. C.
1968

MAP GQ-668

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

GEOLOGIC QUADRANGLE MAP
BRANDENBURG MOUNTAIN QUADRANGLE, ARIZONA
GQ–668



EXPLANATION

Qal Ql Qt Qp Qs — Surficial deposits
Qal, *alluvium*
Ql, *landslides*
Qt, *talus*
Qp, *gravel veneer on pediments and lower terraces*
Qs, *surficial deposits, undivided*
Pleistocene to Recent — QUATERNARY

DISCONFORMITY

Tgc — Gila Conglomerate
Pliocene — QUATERNARY

DISCONFORMITY

Ta — Apsey Conglomerate Member (new)

Thh — Hells Half Acre Tuff Member (new)

Tro — Rhyolite-obsidian member
Cinder cone shown by stippled overprint, vent shown by chevron overprint

DISCONFORMITY

Tuav Tcv Tlav — Andesite and conglomerate of Virgus Canyon
Tuav, *upper andesite*
Tcv, *conglomerate*
Tlav, *lower andesite. Largely porphyritic. The so-called turkey track porphyry*

DISCONFORMITY

Taru Tar — Aravaipa Member (new)
Taru, *upper nonwelded zone*
Tar, *partly welded, welded, and lower nonwelded zones*

DISCONFORMITY(?)

Ttb Tcb — Tuff and conglomerate of Bear Springs Canyon
Tcb, *conglomerate*
Ttb, *tuff*

Tad Tcd — Andesite and conglomerate of Depression Canyon
Tcd, *conglomerate*
Tad, *andesite*

Tto — Tuff of Oak Springs Canyon
Shown only in sections A–A', C–C', and F–F'

DISCONFORMITY(?)

Thj — Holy Joe Member

DISCONFORMITY(?)

Twt Tw — Whitetail(?) Conglomerate
Tw, *conglomerate*
Twt, *white rhyolite tuff bed*

Miocene — Galiuro Volcanics — TERTIARY

UNCONFORMITY

Pn — Naco Limestone
Middle Pennsylvanian — PENNSYLVANIAN AND MISSISSIPPIAN — CARBONIFEROUS

DISCONFORMITY

Me — Escabrosa Limestone
PENNSYLVANIAN AND MISSISSIPPIAN — CARBONIFEROUS

DISCONFORMITY

Dm — Martin Formation
Upper Devonian — DEVONIAN

DISCONFORMITY

Cau Cam Cal — Abrigo Formation
Cau, *upper (or brown sandy) member*
Cam, *middle (sandstone) member*
Cal, *lower (mudstone) member*
Dots indicate basal cobble conglomerate
Middle and Upper Cambrian — CAMBRIAN

Cb — Bolsa Quartzite
Shown only in sections B–B', and C–C'
Middle Cambrian — CAMBRIAN

REGIONAL DISCONFORMITY

db — Diabase

tu tl — Troy Quartzite
tu, *upper unit*
tl, *lower unit*
Younger Precambrian — Apache Group — PRECAMBRIAN

DISCONFORMITY

ds — Dripping Spring Quartzite
Older Precambrian — PRECAMBRIAN

ANGULAR UNCONFORMITY

py — Porphyry
Probably part of Pinal Schist — PRECAMBRIAN

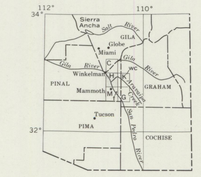
Contact, showing dip
Dashed where approximately located; dotted where concealed

Fault
Dotted where concealed; queried where doubtful.
U, *upthrown side*; D, *downthrown side*

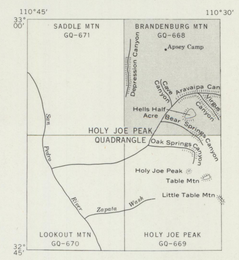
Inclined — Overturned Bedding — Horizontal

Horizontal — Inclined — Vertical
Foliation in schist and layered structure in volcanic rocks

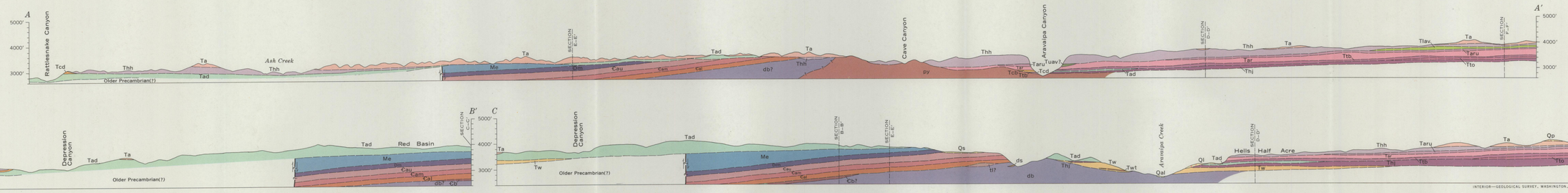
Lineation, showing plunge



INDEX MAP OF SOUTHEASTERN ARIZONA SHOWING FIVE 15-MINUTE QUADRANGLES C. CHRISTMAS; H. HOLY JOE PEAK; K. KLONDYKE; M. MAMMOTH; G. GALIURO MOUNTAINS
wc indicates location of Williamson Canyon
f indicates fossil locality in the Gila Conglomerate



INDEX MAP OF THE HOLY JOE PEAK 15-MINUTE QUADRANGLE SHOWING 7½-MINUTE QUADRANGLES AND TOPOGRAPHIC FEATURES REFERRED TO IN THE EXPLANATION



GEOLOGIC MAP OF THE BRANDENBURG MOUNTAIN QUADRANGLE, PINAL COUNTY, ARIZONA

By
Medora H. Krieger

1968

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1968—G67104

For sale by U.S. Geological Survey, price $1.00

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

TO ACCOMPANY MAP GQ-668

GEOLOGIC MAP OF THE BRANDENBURG MOUNTAIN QUADRANGLE PINAL COUNTY, ARIZONA

By
Medora H. Krieger

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

Alluvium (0- about 15 ft).—Unconsolidated gravel, sand, silt, and clay.

Landslides (0-100? ft).—Consist largely of Galiuro Volcanics, locally cemented with caliche.

Talus (0- about 50 ft).—Rock debris consisting of large angular blocks to silt-sized particles, locally cemented with caliche.

Gravel veneer on pediments and lower terraces (0-25 ft).—Largely subangular pebbles and cobbles of Paleozoic and younger Precambrian sedimentary rocks in a generally reddish-brown, fine- to coarse-grained matrix. Reddish-brown color less pronounced on younger terraces and generally lacking on higher level (about 4,000 ft), older(?) surfaces where the gravels are composed largely of Galiuro Volcanics. Locally includes some pediments and terraces stripped of gravels.

Surficial deposits, undivided (0-20 ft).—Include fine-grained colluvium and alluvium, and some pediment and terrace gravels.

GILA CONGLOMERATE (0-400 ft)

Fanglomerate consisting of subangular to subrounded pebbles, cobbles, and small boulders of Paleozoic rocks, and lesser amounts of Galiuro Volcanics and Precambrian rocks. Matrix is light shades of gray, green, and brown, generally well cemented, and composed of small pebbles to silt-sized particles. Pliocene age of Gila in this area indicated by pre-Blancan fossils (J. F. Lance, oral communications, 1964) in presumably equivalent beds southeast of Mammoth.

GALIURO VOLCANICS

Includes Apsey Conglomerate Member, Hells Half Acre Tuff Member, rhyolite-obsidian member, andesite and conglomerate of Virgus Canyon, Aravaipa Member, tuff and conglomerate of Bear Springs Canyon, andesite and conglomerate of Depression Canyon, tuff of Oak Springs Canyon, and Holy Joe Member. K-Ar determinations on biotite and sanidine from the Hells Half Acre Tuff, Aravaipa, and Holy Joe Members, and from the tuff of Bear Springs Canyon yielded ages of 22.4 to 25.9 million years (S. C. Creasey, oral communication, 1965).

APSEY CONGLOMERATE MEMBER[1] AND[2] (0-400 ft)

Here named Apsey Conglomerate Member. Type locality in vicinity of Apsey Camp, Ash Creek, sec. 25, T. 5 S., R. 17 E. Reference sections, showing relations to underlying rhyolite-obsidian or intervening Hells Half Acre Tuff Members, are north of Aravaipa Canyon in secs. 5, 6, 7, and 8, T. 6 S., R. 18 E.; and along Ash Creek, secs. 19, 20, 29, and 30, T. 5 S., R. 18 E. Overlain by andesite of Table Mountain only in the Holy Joe Peak quadrangle (Krieger, 1967b). Cliff-forming, thin-bedded, yellowish- to light-gray conglomerate and some conglomeratic tuff composed of pebbles, cobbles, and scattered boulders, largely derived from the rhyolite-obsidian member. It also contains sparse to abundant fragments of older rocks, including older members of the Galiuro Volcanics. The well-indurated, sandy, mostly noncalcareous matrix consists of quartz, feldspar, and many small rock and crystal fragments. Pumice shards and lapilli are common in some of the conglomerate, especially in the lower part. The member is well jointed and locally it erodes to conical forms and weird columnar shapes; many cliff faces are cavernous. The conglomerate conformably and gradationally overlies the Hells Half Acre Tuff Member.

HELLS HALF ACRE TUFF MEMBER[1] AND[2] (0-500 ft)

Here named Hells Half Acre Tuff Member for exposures on Hells Half Acre, sec. 19, T. 6 S., R. 18 E. Type locality in Aravaipa Canyon upstream from Javalina Canyon, sec. 7, T. 6 S., R. 18 E., where the member is completely exposed in inaccessible cliffs. Consists of three units, from top to bottom: (1) (0-100 ft or more). Cliff- and slope-forming, white, air-fall and partly reworked vitric, lithic (rhyolite and pumice lapilli), and crystal tuff. Narrow, deep crevices have developed along prominent northeast- and northwest-trending joints, especially on Hells Half Acre. (2) (0-400 ft, maximum thickness between Javalina and Cave Canyons). Massive, cliff-forming, white, vitric tuff, possibly one or more nonwelded to slightly welded ash-flow tuffs[3]. Composed of white to yellowish-brown pumice lapilli, some obsidian and rhyolite lapilli, and grains of quartz, feldspar and minor biotite. (3) (0-50 ft). Well-bedded, cliff-forming, porous, yellowish-brown to brown, finely crystalline rhyolite tuff with pumice lapilli, grains of quartz, feldspar, and biotite, and scattered accidental fragments. The base in Horse Camp Canyon is a thin wedge of crossbedded, tuffaceous sandstone. Rhyolite tuff in the northeast corner of the quadrangle is tentatively included in this member, although some of it is overlain by the rhyolite-obsidian member. Pumice lapilli and groundmass of the member have been extensively zeolitized (heulandite or clinoptilolite).

RHYOLITE-OBSIDIAN MEMBER[2] (0-1,000? ft)

Gray and black, flow-banded to massive, perlitic to lithophysal obsidian, finely laminated to contorted, gray, stony (devitrified), locally lithophysal rhyolite, flow breccias. Some breccias are composed of angular fragments of very vesicular, vitric rhyolite. Rhyolite and obsidian contain small amounts of sanidine, quartz, plagioclase, pyroxene, hornblende, iron oxide, and sphene, and scattered accidental fragments. Lithophysae, generally 1-3 cm in diameter, in places are strung out, giving large outcrops a steeply dipping, bedded appearance. Chalcedony-lined geodes are as much as 10 cm in diameter. The member probably was extruded as domes and stubby flows. Cinder cones, some unmapped, consist of steeply dipping, well-bedded material, associated with tuff, conglomerate, and breccia. They contain variable amounts of older rocks.

ANDESITE AND CONGLOMERATE OF VIRGUS CANYON

Upper andesite (0-100 ft).—Dark-colored, fine-grained, amygdaloidal andesite with small phenocrysts of plagioclase, altered olivine, and pyroxene. Exposed only as thin flows along Aravaipa and Virgus Canyons upstream from their junction, and as a thin remnant (?) south-southwest of the mouth of Javalina Canyon. Overlain by the rhyolite-obsidian member in Horse Camp Canyon. Mapped as upper andesite unit by Simons (1964), who correlated it with andesite that overlies rhyolite-obsidian north of Aravaipa Canyon, in an area where his upper tuff unit (Hells Half Acre Tuff Member of this report) is absent.

Conglomerate (0-100 ft).—Pebbles and cobbles derived from lower andesite of Virgus Canyon and older rocks in a sandy matrix. Along Whitewash, Bear Springs, and lower Aravaipa Canyons, 0-25 ft of unmapped conglomerate composed largely of the lower andesite separates the Aravaipa Member from the Hells Half Acre Tuff Member. A few feet of unmapped conglomerate locally underlies the lower andesite.

[1]Upper tuff unit of Simons (1964) includes Apsey Conglomerate and Hells Half Acre Tuff Members.

[2]Tertiary tuff and rhyolite of Willden (1964) includes Apsey Conglomerate, Hells Half Acre Tuff, and rhyolite-obsidian members.

[3]Terminology for pyroclastic rocks from Ross and Smith (1961) and Smith (1960).