



EXPLANATION

PLUTONIC AND HYPABYSSAL INTRUSIVE ROCKS

LAYERED SEDIMENTARY, PYROCLASTIC, AND METAMORPHIC ROCKS

QUATERNARY

Qad Aeolian sand
Mobile in dunes; adapted from Brankamp and others, 1956

Qal Sand
Alluvial, sheet wash, and aeolian sand

Qg Gravel
Composed mainly of limestone and other rocks of local origin; older gravel may be present; adapted from Brankamp and others, 1956

Qgp Lag gravel
Mostly lag gravel; may include some beds of Tertiary age; adapted from Brankamp and others, 1956

PERMIAN

Pk Khuff Formation
Light-colored limestone, interbedded argillaceous limestone, dolomite, marl, gypsumiferous clay, shale; exposures poor, probably mainly shale and marl; adapted from Brankamp and others, 1956

PRECAMBRIAN OR PALEOZOIC

UNCONFORMITY

Shammar Rhyolite
Younger rhyolite
Dikes of red rhyolite; dark red and aphanitic where thin; where thicker than about 3m, pink spilitic cores with fine-grained hornblende and biotite set in equigranular feldspar with sparse quartz

UNCONFORMITY

Alkaline granite ?
Pink, even-grained biotite granite and associated granitic dikes, intrusive into andesite and red biotite granite; mainly covered by pediment sand

MURDAMA GROUP

ag ac
Abi Formation
Gray-green graywacke sandstone, laminated, argillite, gray to black sandy conglomeration, sparse gray limestone; unmetamorphosed (ag); metamorphosed to sericite-chlorite schist of chlorite zone (ac)

zc
Z'reiba Formation
Coarse conglomerate composed of boulders, cobbles, and pebbles of hornblende-biotite granite, red biotite granite, red rhyolite, diorite, gabbro, and andesite; sandy matrix rich in epidote, hornblende, and magnetite; in upper part lenticular masses of red paper and siliceous red shale; unmetamorphosed

UNCONFORMITY

de
Andesite dikes
Andesite, andesite porphyry in dike swarm; locally thick dikes are dioritic

dsg
Diorite and gabbro
Medium-grained diorite grading into gabbro; intrudes gray hornblende-biotite granite and red biotite granite; diorite dikes in southwest corner of quadrangle

ba
Badrlyah Formation
Massive, dark-green unmetamorphosed andesite flows; intruded by dikes of pink alkaline granite (ga?)

UNCONFORMITY

Older rhyolite
Dikes of red rhyolite in southeast part of quadrangle; possibly related to red biotite granite (gr)

gr
Red biotite granite and gray hornblende-biotite granite
Red biotite granite (gr) is dominantly red, calc-alkalic, medium-grained, massive to faintly anisitic biotite granite, quartzose pink biotite granite, quartz porphyry, pink hornblende-biotite granite; numerous possible cognate inclusions of dark rock; genetically related to gray hornblende-biotite granite (gg), which is medium- to coarse-grained, massive, gray, hornblende-biotite granite, hornblende granodiorite, biotite granite, and pyroxene granite; generally epidotized

PRECAMBRIAN

Contact
Dashed where approximately located or inferred; dotted where concealed. Where contact follows a metamorphic isograd, the highest rank index mineral is shown on the high-rank side

Fault
Showing relative horizontal movement where known. Dashed where approximately located or inferred; dotted where concealed

Syncline
Showing troughline and direction of plunge

Strike and dip of beds

Strike and dip of cleavage

Strike and dip of foliation showing plunge of lineation

Dike

Dry water well

20ppm Cu or less
100ppm Zn or less
Location and metal content by chemical analysis of sample of wadi sediment expressed in parts per million (ppm)

2ppm Mo
3ppm Mo
Molybdenum content by spectrographic analysis of wadi sand (located by adjacent copper symbol)

Anomalous element in wadi sand: Beryllium (Be) 15ppm (located by adjacent copper symbol)

Ba Be Cr La Ti V Zr
Threshold elements in wadi sand, determined by spectrographic analysis: Barium (Ba) 1000ppm; beryllium (Be) 3ppm; chromium (Cr) 1000ppm; lanthanum (La) 20, 30, and 50ppm; titanium (Ti) 5000ppm; vanadium (V) 150 and 200ppm; zirconium (Zr) 150ppm (located by adjacent copper symbol)

Mo W Zn
Threshold elements in concentrates or magnetite, determined by chemical analysis: Molybdenum (Mo) 15, 20, and 30ppm in concentrates; 20ppm in magnetite; tungsten (W) 20 and 50ppm in concentrates; zinc (Zn) 150ppm in magnetite (located by adjacent copper symbol)

Scheelite and powellite
Present in concentrates from wadi sand (superimposed on symbol for copper)

AREA OF THIS MAP

124 Jabal Bitran quadrangle
125 Ayn Qunay quadrangle
126 Bi'r al Badriyah quadrangle
127 Sabkhat Murayyah quadrangle
128 Bi'r Ghamrah quadrangle

AREA OF OTHER MAPS IN THIS SERIES

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Geology of the Precambrian area mapped by W. C. Overstreet and J. W. Whitlow, U. S. Geological Survey, May-June 1964. Geology east of the Precambrian area adapted from Brankamp and others (1956).

RECONNAISSANCE GEOLOGIC MAP OF THE WADI MAHRAGHAH QUADRANGLE, KINGDOM OF SAUDI ARABIA
By
William C. Overstreet, and Jesse W. Whitlow
1972