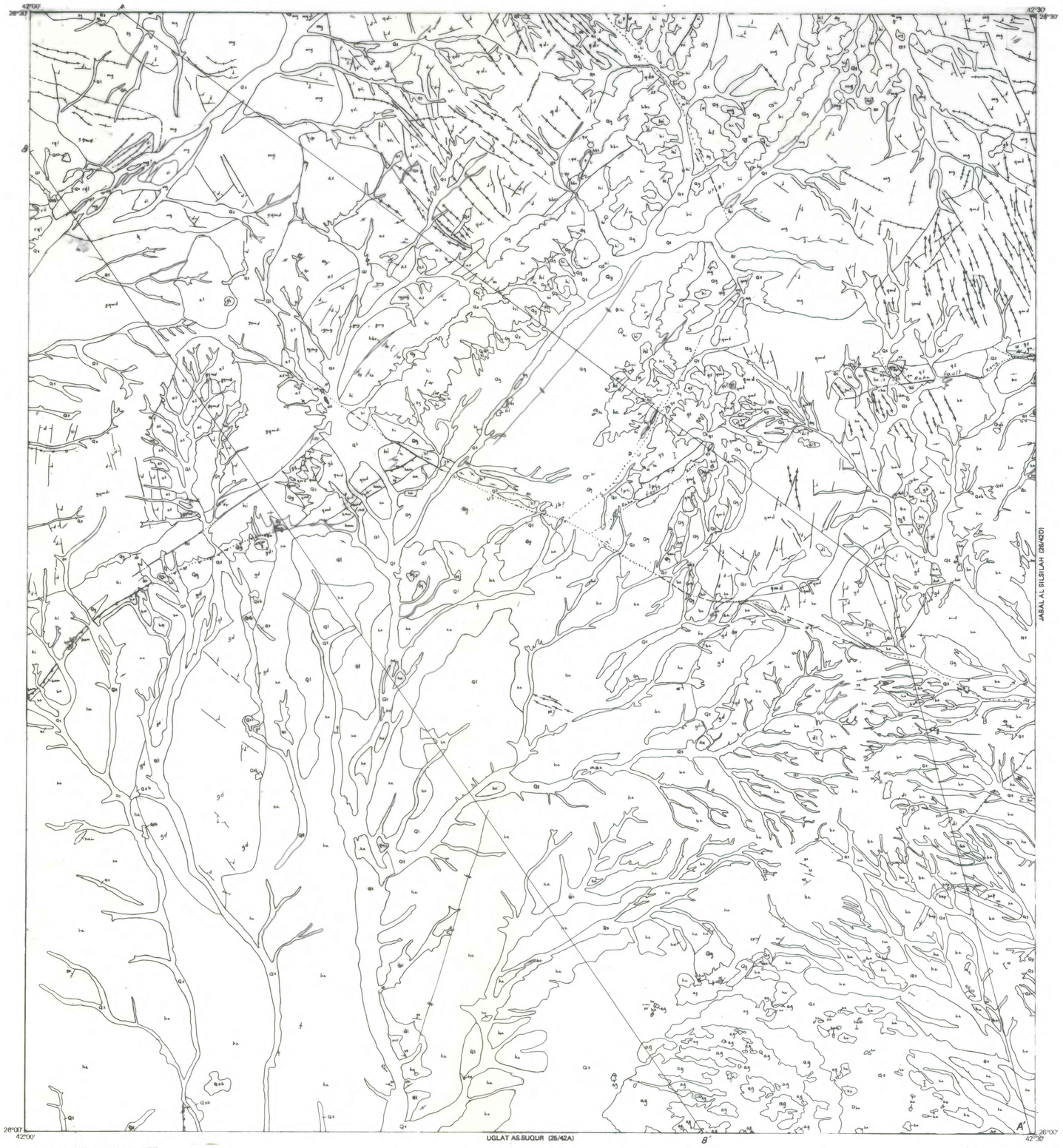
U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY, PREPARED FOR

MINISTRY OF PETROLEUM AND MINERAL RESOURCES
DEPUTY MINISTRY FOR MINERAL RESOURCES

KINGDOM OF SAUDI ARABIA

OPEN-FILE REPORT USGS 84-383
PLATE 1



Aerial photography 1966 and controlled mosaic 1969
Aero Service Corporation, Philadelphia, Penn., U.S.A.

This report has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.

TRUE NORTH

SCALE 1 : 100 000

2 0 2 4 6 8 10 KILOMETERS

2 0 2 4 6 8 10 MILES

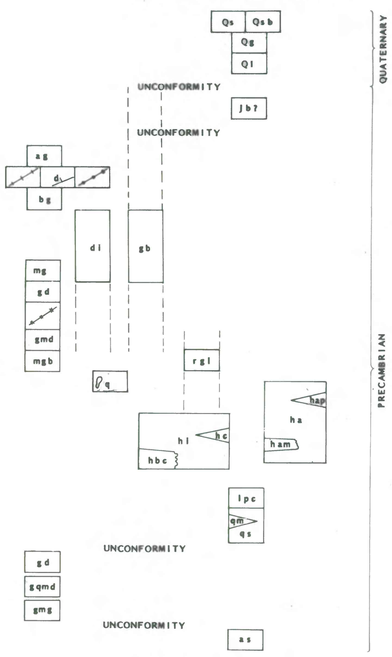
DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

Geology mapped in April, May, and November, 1982

EXPLANATION

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

SEDIMENTS AND METASEDIMENTARY AND METAVOLCANIC ROCKS

Qs WADI DEPOSITS--Light-brown sand, silt, and fine gravel; includes some areas of eolian sand and silt

Qsb SABKHAH DEPOSITS--Light-brown to white clay and silt, commonly mixed with saline minerals

Qg ALLUVIAL FAN GRAVELS--Dark-colored, poorly bedded gravels of cobble to pebble size flanking mountainous areas of resistant rock

Ql QUARTZ LAG DEPOSITS--Mantle of white, angular, pebble-sized quartz covering large areas underlain by the Hadiyah formation

jb? JIBALAH GROUP(?)--Black to dark-gray, pebbly, poorly bedded siltstone and lithic sandstone

rql RHYOLITE AND QUARTZ LATITE--Pink and red porphyritic rhyolite containing sparse phenocrysts of plagioclase and potassium feldspar, and gray porphyritic latite(?) containing about 25 percent phenocrysts of potassium feldspar, plagioclase, and quartz and sparse biotite and hornblende in a fine-grained, somewhat granophyric groundmass. Occurs as irregular flows. Some units may be pyroclastic; some may be sills. Composition is inferred from phenocryst content

MURDAMA GROUP

ha Hadiyah Formation Undivided--Olive-green and light-brown, strongly cleaved calcareous siltstone, shale, and fine-grained graywacke; dark-green, massive greenstone; gray calcareous argillite; and sparse thin beds of dark gray limestone and marble

hap Pillow Lava--Dark-gray to olive-green, slightly porphyritic andesitic or basaltic lava flows consisting of well-formed pillows

ham Limestone--Medium-gray, variably bedded to massive marble and limestone commonly containing white calcite veinlets

HIBSHI FORMATION

hl Hibshi Formation Undivided--Dark-green, coarse-grained lithic sandstone; thick bedded, rarely cross-bedded; contains a few beds of pebble and cobble conglomerate, and sparse "floating" rounded pebbles of resistant rock types; sparse beds of lithic tuff near base; light green shale and siltstone rip-rap clasts are common

hc Conglomerate--Greenish-gray conglomerate consisting of pebbles and cobbles of calcareous siltstone, graywacke sandstone, and shale derived from the Hadiyah formation; matrix is coarse sand; contains coarse sandstone interbeds that mark the top of fining-upward depositional cycles 10 or so m thick

hbc Boulder Conglomerate--Gray and green boulder to cobble conglomerate consisting mostly of rounded to subrounded clasts of diorite, dike rocks, and acidic to intermediate volcanic rocks; contains sparse coarse sandstone beds

lpc Limestone-Pebble Conglomerate--Black to dark-green, thick-bedded pebble and cobble conglomerate. Most clasts are of siltstone and sandstone, and some are of conspicuous, white to light-gray limestone and marble

qs QARNAYN SANDSTONE--Black thin-bedded fine- to medium-grained lithic sandstone, contains sparse pebbles of resistant rock types

qm MARBLE--tan-weathering fine- to coarse-grained marble with calc-silicate minerals in places

as AMPHIBOLITE AND SCHIST--Dark-green to black foliated amphibolite, hornblende-bearing quartzo-feldspathic schists, and vitreous quartzite

INTRUSIVE ROCKS

ag ALKALI-FELDSPAR GRANITE--Light orange-gray, hypidiomorphic-inequigranular, coarse-grained, slightly porphyritic; contains biotite and muscovite

FELSIC DIKES--Light red and orange porphyritic to aphanitic dikes, commonly containing phenocrysts of quartz and potassium feldspar. Occur in most large plutons

INTERMEDIATE DIKES--Mostly gray porphyritic-aphanitic rock containing phenocrysts of plagioclase, hornblende, and biotite. Occur in some large plutons

DIKES--Composition and lithology unknown. Transect all large plutons

sg SYENOGRANITE--Pink, porphyritic, hypidiomorphic, coarse-grained granite containing abundant euhedral perthitic orthoclase, minor slightly coarser grained euhedral sodic plagioclase, minor biotite, and anhedral interstitial quartz in a fine-grained granophyric groundmass

di DIORITE--Gray, medium-grained rock consisting of euhedral plagioclase, brown or green hornblende, and minor chloritized biotite and quartz. Forms small plutons

gb GABBRO--Black, medium- to coarse-grained rock composed of calcic plagioclase, pyroxene, amphibole, and olivine in varying proportions. Rock forms small plutons and weathers to round boulders

mg MONZOGRANITE--Gray and pink coarse- to medium-grained, hypidiomorphic-equigranular biotite granite

gd GRANODIORITE--Gray, medium-grained, hypidiomorphic-equigranular rock of granodiorite to quartz diorite composition. Mafic minerals are biotite, or biotite and hornblende; dark, fine-grained, discoid mafic inclusions are 1-4 percent of the rock

MAFIC DIKES--Black to dark-gray, porphyritic-aphanitic dikes; most contain phenocrysts of calcic plagioclase, pyroxene, hornblende, and secondary chlorite. Transect most large plutons

qmd QUARTZ MONZODIORITE--Gray, medium- to coarse-grained, hypidiomorphic-inequigranular rock containing plagioclase, orthoclase or microcline, quartz, biotite, and green hornblende

mgb METAGABBRO--Dark-green to black, sheared mafic plutonic rock composed of altered plagioclase and chlorite formed from altered mafic minerals. Crops out along Raha fault zone

q QUARTZ--White milky quartz, commonly containing minor calcite and locally stained with iron oxide, forming pods and veins principally in the Hadiyah formation

qd QUARTZ DIORITE--Gray medium- to coarse-grained hypidiomorphic-inequigranular rock of diorite, quartz diorite and tonalite composition, consisting of plagioclase, quartz, and minor perthitic orthoclase and biotite. Dark-gray, fine-grained, discoid mafic inclusions are 1-2 percent of rock

qd QUARTZ DJORITE--Gray, medium- to coarse-grained hypidiomorphic-inequigranular rock of diorite, quartz diorite and tonalite composition, consisting of plagioclase, quartz, and minor perthitic orthoclase and biotite. Dark-gray, fine-graine, discoid mafic inclusions are 1-2 percent of rock

gmg GNEISSIC MONZOGRANITE--Gray porphyritic granite consisting of medium-grained plagioclase and quartz, and coarse-grained potassium feldspar; accessory biotite is chloritized. Rock is weakly gneissic

SYMBOLS

CONTACT -- Dashed where approximately located

FAULT -- Dashed where approximately located; dotted where concealed; arrows show direction of strike slip, U, D show up, down vertical slip

OVERTHRUST FAULT -- Teeth on upper plate

ANTICLINE -- Showing trace of axial plane and direction of plunge

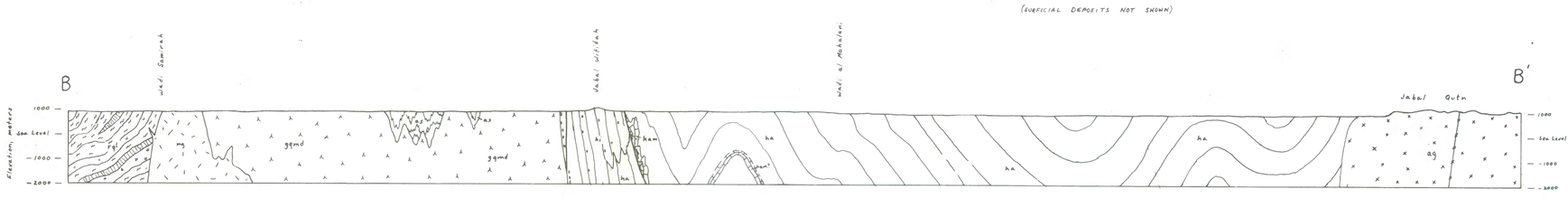
SYNCLINE -- Showing trace of axial plane

FOLD -- Showing trace of axial plane and bedding; type of fold not known

20 STRIKE AND DIP OF BEDS
Inclined, showing dip
Vertical

20 STRIKE AND DIP OF FOLIATION
Inclined, showing dip
Vertical

80 STRIKE AND DIP OF FRACTURE CLEAVAGE
Inclined, showing dip
Vertical



GEOLOGY OF THE SAMIRAH QUADRANGLE, SHEET 26/42 C, KINGDOM OF SAUDI ARABIA

by
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1984