

DETAILED GEOLOGY AND STRUCTURE
OF THE ISHMAS GOLD DISTRICT

BY
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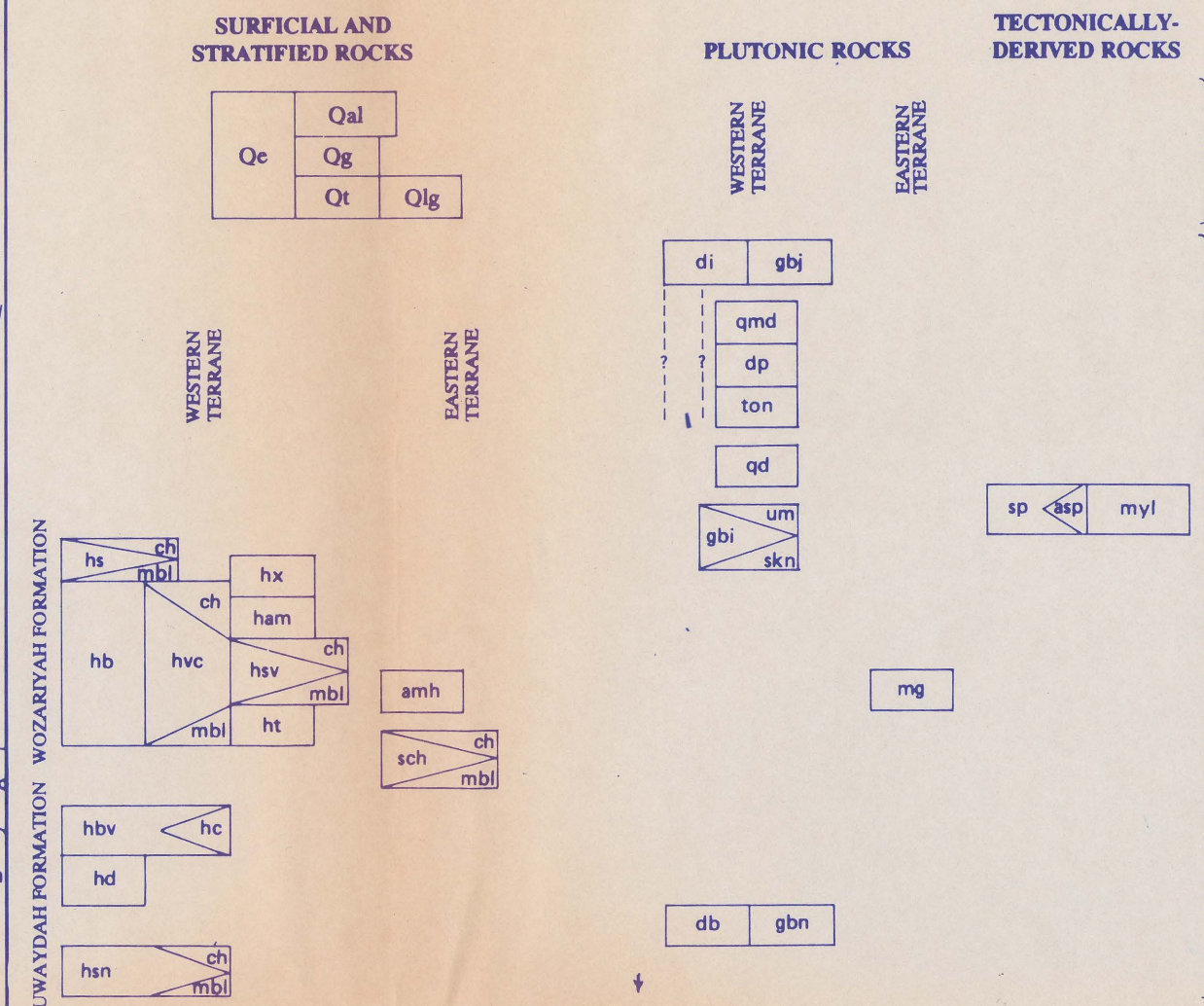
EXPLANATION OF MAP SYMBOLS

- GEOLOGIC CONTACT—Dashed where inferred, dotted where covered
- FAULT—Showing relative displacement where known, dashed where inferred, dotted where covered
- SHEAR ZONE—Showing true width
- SYNCLINE—Showing direction of plunge
- STRIKE AND DIP OF BEDDING—In elastics and volcanoclastic rock
Inclined
Vertical
Overturned
- PRIMARY IGNEOUS LAYERING—In volcanic rocks and layered gabbro - showing dip
Inclined
Vertical
- SHEAR FOLIATION—In cataclastic rock (mylonite)
Inclined
Vertical
- FRACTURE CLEAVAGE—showing dip
Inclined
Vertical
- ELEVATION—In meters
X 800
- DIKE
Mafic
Felsic
- QUARTZ VEIN—Showing dip
- QUARTZ HEALED BRECCIA (at Umm Shat Sharq)
- ANCIENT WORKING
Individual
Grouped or closely spaced

ANCIENT MINES REFERRED TO IN TEXT WITH MODS NUMBER

- 1 Ishmas Kabir (01458)
- 2 Abu Tal (01433)
- 3 Ishmas (00650)
- 4 Umm Shat Sharq Group (01459)
- 5 Umm Shat Sharq - Mine C (01460)
- 6 Umm Shat Sharq - Mine A (01460)
- 7 Umm Shat Sharq - Mine B (01460)
- 8 Al Suwaydah (4672)
- 9 Al Suwaydah Sharq (4673)
- 10 Nabitah Shamal (4678)
- 11 Nabitah Sharq (4679)
- 12 Al Wozariyah Shamal (4676)
- 13 Al Suwaydah Janub (4674)
- 14 Nabitah (01449)
- 15 Al Wozariyah (4675)
- 16 Nabitah Janub Group (4677)

CORRELATION OF MAP UNITS



EXPLANATION OF MAP UNITS

- SURFICIAL AND STRATIFIED ROCKS
- Qe EOLIAN DEPOSITS
 - Qal WADI ALLUVIUM
 - Qg TERRACE AND PEDIMENT GRAVEL DEPOSITS
 - Qt TALUS DEPOSITS
 - Qlg QUARTZ LAG DEPOSITS

- Western Terrane
- hs WOZARIYAH FORMATION
Wacke and sandstone—Thick sequence of gray to black volcanic wacke and sandstone with interbedded dolomitic marble (mb) and minor basalt and chert (ch)
 - hx Ferruginous chert and carbonate—Intercalated lenses of ferruginous chert and carbonate within basalt. Some ferruginous bodies true gossan and show malachite staining
 - hb Basalt and andesite—Gray to black, feldspar-phyric flow rock; commonly massive
 - hvc Siliceous volcanoclastic unit—Intercalated tuff breccia, crystal-litic lapilli tuff, ash-fall and ash-flow tuff and subordinate dacite and minor marble (mb) and chert (ch)
 - ham Fine-grained amphibolite—Green aphanitic rock with occasional carbonatic-filled amygdulites and pebble-size lithic clasts
 - hsv Siliceous volcanic unit—Dacitic flow rock, subordinate andesite and crystal-litic tuff, and interbedded chert (ch) and marble (mb)
 - ht Laminated tuff—Laminated to thin-bedded ash-fall and waterlain tuff commonly exhibiting pencontemporaneous deformation structures
 - hbw SUWAYDAH FORMATION
Vesicular basalt and andesite—Green amygdaloidal flow rock. Amygdulites filled with quartz and locally cause the rock to appear as a pebbly mudstone
 - hc Mafic volcanoclastic unit—Mafic ash-fall tuff, ash-flow lapilli tuff, and tuff breccia with minor interbedded basalt
 - hd Basalt and diabase—Highly altered and broken feldspar-phyric basalt and minor diabase sills
 - hsn Volcanogenic sedimentary unit—Mafic volcanoclastic sequence (greenstone) consisting of wacke, laminated tuff, and ash-flow tuff and interbedded chert (ch) and marble (mb)

- Eastern Terrane
- amh AMPHIBOLITE—Amphibolized volcanoclastic rocks, schistose amphibolite, and coarse-grained amphibolite
 - sch SCHIST—Cataclastic metabreccia, mylonite, ultramylonite, and mylonitic gneiss and schist. Interbedded chert (ch) and marble (mb)

- PLUTONIC ROCKS
- Western Terrane
- di UNASSIGNED GABBRO AND DIORITE—Isolated and altered plugs of gabbro and diorite scattered throughout the district
 - gbi YOUNG GABBRO—Small plugs of relatively unaltered gabbro occurring along Najd structures
 - qmd QUARTZ MONZODIORITE—Light gray, equigranular, fine-grained circular stock in north-central part of district. Host to and genetically associated with auriferous quartz vein mineralization at Umm Shat Sharq
 - dp DACITE PORPHYRY—Reddish feldspar-quartz porphyry stocks and cupolas. Spatially and genetically associated with auriferous quartz vein mineralization at the Al Wozariyah and Umm Shat Sharq ancient mines
 - ton TONALITE—Grayish white seriate feldspar-phyric rock. Forms elongated body in central and north-central part of district
 - qd QUARTZ DIORITE—Black and white speckled, fine-grained rock, weathers to smooth rounded surfaces. Exposed in the southwest part of the district
 - gbi ISHMAS GABBRO—Cumulate rock with rhythmic layering on a centimeter to meter scale defined by white plagioclase-rich and dark-green mafic-rich layers. Forms large logolithic body in the west-central part of the district. Contains black pods of primary ultramafic rock (um). In contact with wollastonite-grossularite-vesuvianite skarn (skn) in the southwest part of the district
 - db NABITAH MAFIC COMPLEX
Diabase—Fine-grained, dark-green rock forming extensive sill complex in the eastern part of the district. Considerably mylonitized and altered. Rhythmic layering common in the more gabbroic parts
 - gbn Gabbro—Medium-grained, highly altered and broken gabbro and minor diabase. Exposed in southeast part of the district
- Eastern Terrane
- mg MONZOGRANITE—Leucocratic, medium-grained rock with tectonic foliation. Poorly exposed in the southeast part of district forming grass-covered plains
- TECTONICALLY-DERIVED ROCKS
- sp SERPENTINITE—Dark-green to black diapiropic bodies emplaced along deep-seated structures. Commonly altered to a pinkish to rusty-brown siliceous carbonate rock (asp)
 - myl MYLONITE—Gray, flinty, highly cleaved and foliated cataclastic rock commonly with white oval porphyroclasts

GEOLOGY OF THE ISHMAS GOLD DISTRICT, KINGDOM OF SAUDI ARABIA

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