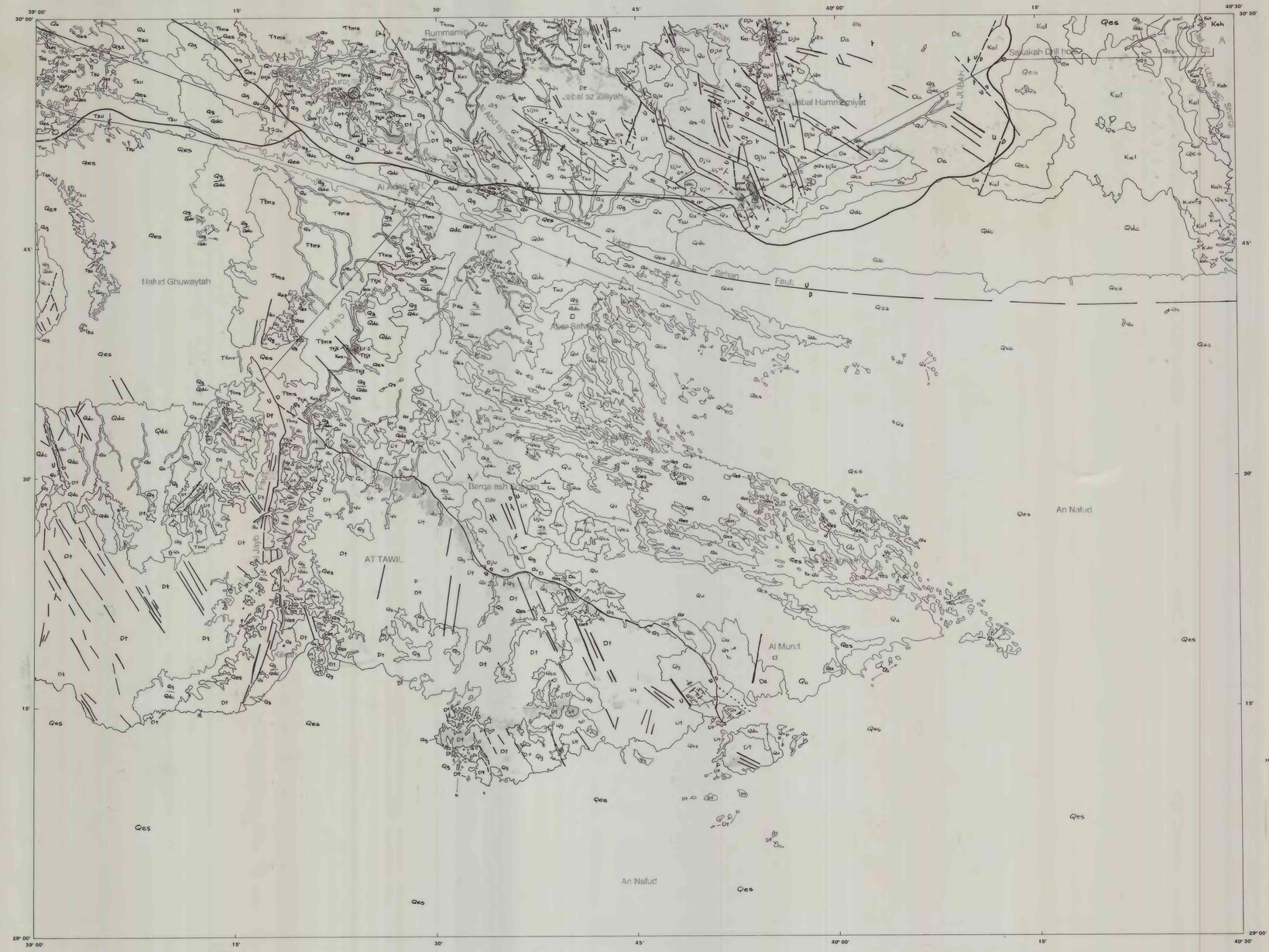
U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY, PREPARED FOR
MINISTRY OF PETROLEUM AND MINERAL RESOURCES
DIRECTORATE GENERAL OF MINERAL RESOURCES

KINGDOM OF SAUDI ARABIA

OPEN-FILE REPORT
USGS-OF-89-342
PLATE 1



Prepared by the United States Geological Survey for the Kingdom of Saudi Arabia from computer enhanced Landsat MSS band 7 imagery.
Imagery controlled to photoidentified ground positions. The root-mean-square error in position of well-defined features in relation to the graticule is approximately 185 meters.
Transverse Mercator Projection

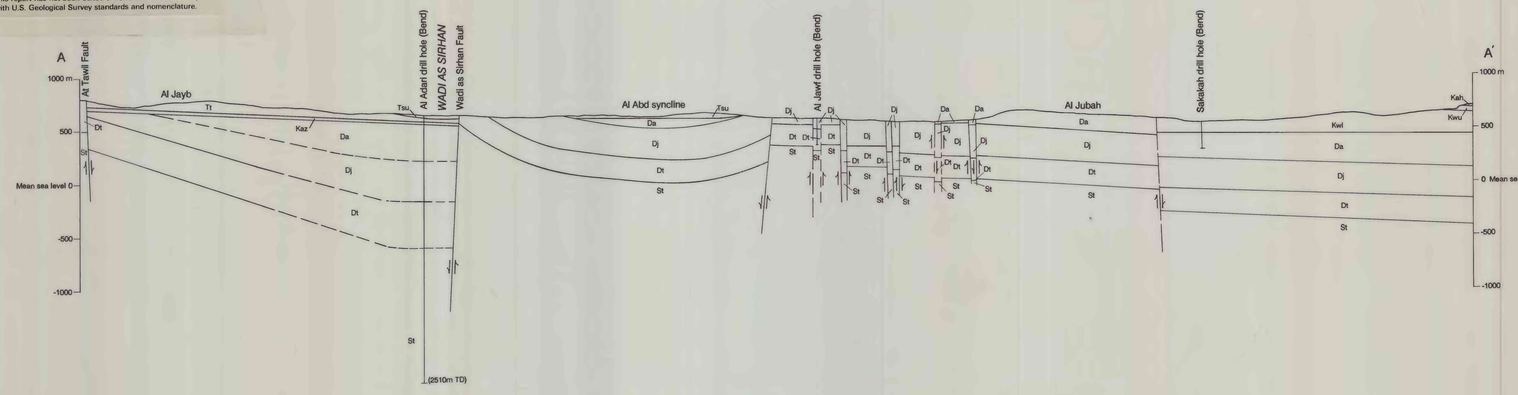
This report has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.

SCALE 1: 250 000

5 0 5 10 15 20 25 KILOMETERS

5 0 5 10 15 20 MILES

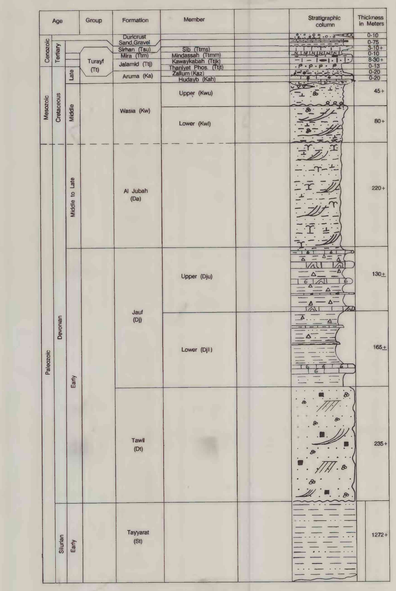
Magnetic declination for 1983 is 2°43' E. over entire area.
Annual rate of change 3' E.

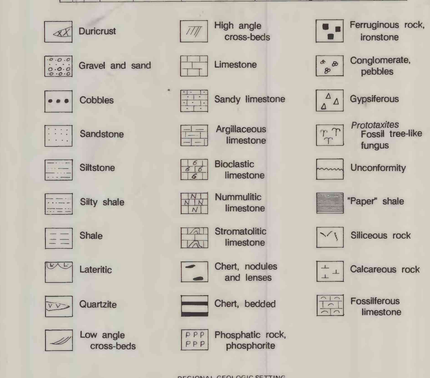


PRELIMINARY GEOLOGIC MAP OF THE AL JAWF QUADRANGLE, SHEET 29 D, KINGDOM OF SAUDI ARABIA

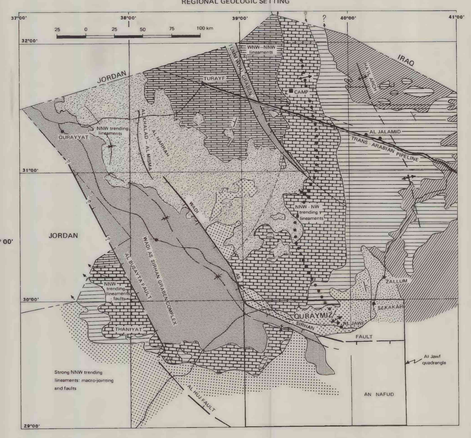
By

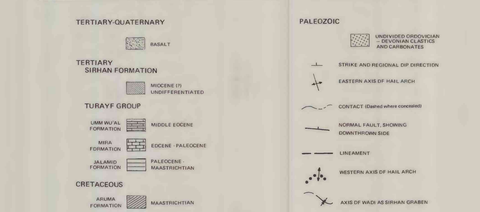
C. R. Meissner, Jr., S. M. Dini, A. M. Farasani,
G. P. Riddler, Marcel van Eck, and N. C. Aspinall



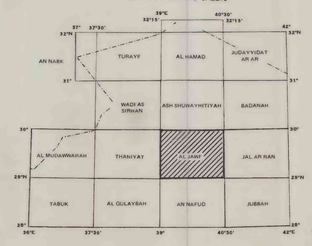


REGIONAL GEOLOGIC SETTING





INDEX TO ADJOINING SHEETS



EXPLANATION OF MAP UNITS

QUATERNARY

- Qu — ALLUVIUM--Unconsolidated silt, sand, and gravel found along wadi courses, depressions, and basins
- Qs — SILT AND CLAY--In undrained depressions forming flat surfaces commonly void of vegetation
- Qsb — SABKAH DEPOSITS--Salt encrusted silt, clay, and muddy sand in playa-like depressions
- Qes — EOLIAN SAND--Mostly stabilized sand dunes and discontinuous sand cover
- Qg — GRAVEL--Fans and outwash plains consisting primarily of chert clasts and siliceous limestone fragments; also found in drainage channels
- Qg_2 — REGOLITH GRAVEL--Semi-consolidated gravel derived from residual material
- Qg — GRAVEL AND DURICRUST--Gravel covered duricrust where Qdc gravel is derived from disintegrated duricrust
- Qdc — CALCAREOUS AND GYPSIFEROUS DURICRUST--Discontinuously mantles bedrock

----------UNCONFORMITY----------

TERTIARY

- Tsu — SIRHAN FORMATION--Multi-colored sandstone and shale with interbeds of sandy limestone

----------UNCONFORMITY----------

MIRA FORMATION (Ttm)

- Ttms — Sib member--Interbedded silicified limestone and chert containing thin phosphorite beds
- Ttmm — Mindassah member--Bioclastic limestone with Nummulitic beds

----------UNCONFORMITY----------

JALAMID FORMATION (Tj)

- Ttjk — Kuwaykabah member--Partly sandy limestone with interbeds of shale, includes chert lenses and nodules
- Ttjt — Thaniyat Phosphorite member--Phosphorite, sandy limestone, shale, and chert

ARUMA FORMATION (Ka)

- Kaz — Zallum member--Friable, multi-colored sandstone and shale. Local quartzite bed near top; cobble bed near base
- Kah — Hudayb member--Limestone, partly dolomitic, algal, and fossiliferous

----------UNCONFORMITY----------

WASIA FORMATION (Kw)

- Kwu — Upper member--Friable sandstone and claystone; lenticular veneer of lateritic sandstone, siltstone, and mudstone at top

----------DISCONFORMITY----------

- Kwl — Lower member--Sandstone, silty shale, and mudstone

----------UNCONFORMITY----------

- Da — AL JUBAH FORMATION -- Sandstone interbedded with silty and sandy shale, includes minor interbeds of siltstone. Contains Devonian index fossil *Prototaxites*

JAUF FORMATION (Dj)

- Djlu — Upper and Lower member combined--Upper member - limestone, shale, and sandstone; limestone contains algal, biohermal, and stromatolitic intervals; shale, gypsiferous. Lower member - shale and siltstone, gypsiferous, with interbeds of sandstone and argillaceous limestone; thin-bedded limestone toward base contains reef mounds
- Dt — TAWIL FORMATION--Sandstone with quartz pebbles; ferruginous

----------UNCONFORMITY----------

- St — TAYYARAT FORMATION--Subsurface only. Shale, claystone, and siltstone. Contains abundant palynomorphs (chitinozoans and acritarchs)

EXPLANATION OF MAP SYMBOLS

- CONTACT
- STRIKE AND DIP OF BEDS--Angle of dip shown where measured
- LINEAMENT--Trend line observed from aerial photographs or Landsat imagery
- U/D — NORMAL FAULT--U, upthrown side; D, downthrown side
- AXIS OF GRABEN OR SYNCLINE--Dashed where approximate or concealed
- A A' — LINE OF CROSS SECTION
- DRILL HOLE
- DF-2 — MEASURED OUTCROP SECTION
- 00369 P — GENERAL LOCALITY OF TRENCHED PHOSPHATE ROCK--Showing MODS number
- QUARRY--Limestone
- VILLAGE
- PAVED HIGHWAY