



DESCRIPTION OF MAP UNITS

QUATERNARY SURFICIAL DEPOSITS

CORAL REEF-- Present-day reef line shown by hachures

QUATERNARY DEPOSITS UNDIVIDED--Consists of beach sand formed by comminution of coral reef

EOLIAN SAND--Most widespread surficial unit in the quadrangle. Consists of beach sand, linear and barchan dunes, and an extensive veneer of sand, overlying old flood plain and loessic deposits

SABKHA AND TIDAL DEPOSITS:

Sabkha deposits--Consist of supratidal accumulations of mud and clay interstratified and incrustated with minor halite and gypsum. In many cases encroached by sand and silt deposited in deltas formed by present-day streams

Tidal deposits--Consist of mud and clay accumulations within the tidal zone; grade laterally into sabkhas

ALLUVIUM--Sand, gravel, and silt of modern active drainage system

OLDER ALLUVIUM--Forms terraces within and on the flanks of active channels

FLOOD-PLAIN DEPOSITS--Deposits of silt, sand and gravel, locally interlayered with boulders, between the main channels of the modern drainage system. Correlates with alluvial terrace deposits of the Sabya quadrangle to the north and thought to be of Pleistocene and Holocene age (Fairer, 1983)

EXPLANATION

CONTACT

PAVED ROAD

DIRT TRACK

INTERNATIONAL BOUNDARY--Approximately located

INTRODUCTION

The Muwassam quadrangle, bounded by lat 16°00' and 16°30' N. and long 42°30' and 43°00' E., includes the very southernmost territory of the Kingdom of Saudi Arabia. The quadrangle is named after Muwassam, a small town and minor border-crossing point for traffic into the Yemen Arab Republic. An asphalted road from the Jizan quadrangle to the north terminates at Muwassam town. Much of the quadrangle includes part of the Yemen Arab Republic and a portion of the Red Sea.

All of the mapped area is occupied by coastal plain bordering the Red Sea. The flat coastal plain is covered by Quaternary surficial deposits overlying a sequence of Tertiary rocks as much as 5 km thick. The coastal plain is separated from the Red Sea by a zone of supratidal sabkha deposits, offshore bars, islands, tidal mud flats, and shallow lagoons. The sea is shallow, less than 200 m deep, and forms part of the shelf marginal to the main axial trough of the Red Sea.

PREVIOUS AND PRESENT WORK

In 1959, the area was included in the 1:500,000-scale geologic map of the Asir quadrangle (Brown and Jackson, 1959). It was subsequently included within an aeromagnetic survey by Hunting Survey Corp. Ltd. (1962), and in a gravity survey (Gettings, 1977).

The present geologic map is based on photointerpretation and field checking in 1977 and 1979 by the author, and a brief reconnaissance in 1984 by consultants for the U.S. Geological Survey (Johnson and Vranas, 1984). A 1:250,000-scale geologic map of the Jizan quadrangle, incorporating the present map, has recently been compiled (Blank and others, in press).

GEOLOGIC SETTING

The surface deposits of the Muwassam quadrangle are entirely of Pleistocene and Holocene age. They include sabkha and tidal mud flats along the coast, eolian sand, flood-plain deposits, and sand and gravel in the stream channels of the present drainage system. These deposits form part of the Tihamat Asir, a plain of gentle gradients and low relief, bordering the Red Sea and extending into the Yemen Arab Republic. The plain results from deposition above a succession of Tertiary volcanic and sedimentary rocks and prograding coral reef during the Quaternary cycle of erosion.

Underlying Tertiary sedimentary rocks do not crop out in the mapped area, but are inferred on the basis of their known occurrence in salt domes in the Jizan quadrangle to the north (Blank and Gettings, 1984) and in the Yemen Arab Republic (Wade, 1931). Geophysical data suggest that they form a unit as much as 5 km thick near the coast, and thin inland (Agocs and Keller, 1962). If similar to the known Tertiary deposits, the subsurface sequence in the Muwassam quadrangle consists of sandstone, siltstone, halite, and gypsum of middle Eocene age, passing up into sandy limestone and coralline limestone of Pliocene to Pleistocene age (Gillmann, 1968). They are part of a sequence of clastic and evaporitic sedimentary rocks deposited throughout the Red Sea at that time, following the first phase of continental separation in the region. By extrapolation of data from neighboring quadrangles, the Tertiary sedimentary rocks rest on a crust between 8 and 18 km thick. The crust represents a transition from crust of average continental thickness and density east of Muwassam quadrangle to a much denser and thinner crust in the west (Healy and others, 1982).

DATA STORAGE

No entries or updates have been made to the Mineral Occurrence Documentation System (MODS) data bank. Field and petrographic data in support of this map have been stored in Data-File USGS-DF-04-36 (Blank, 1984).

REFERENCES CITED

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RECONNAISSANCE GEOLOGIC MAP OF THE MUWASSAM QUADRANGLE, SHEET 16/42 D, KINGDOM OF SAUDI ARABIA

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