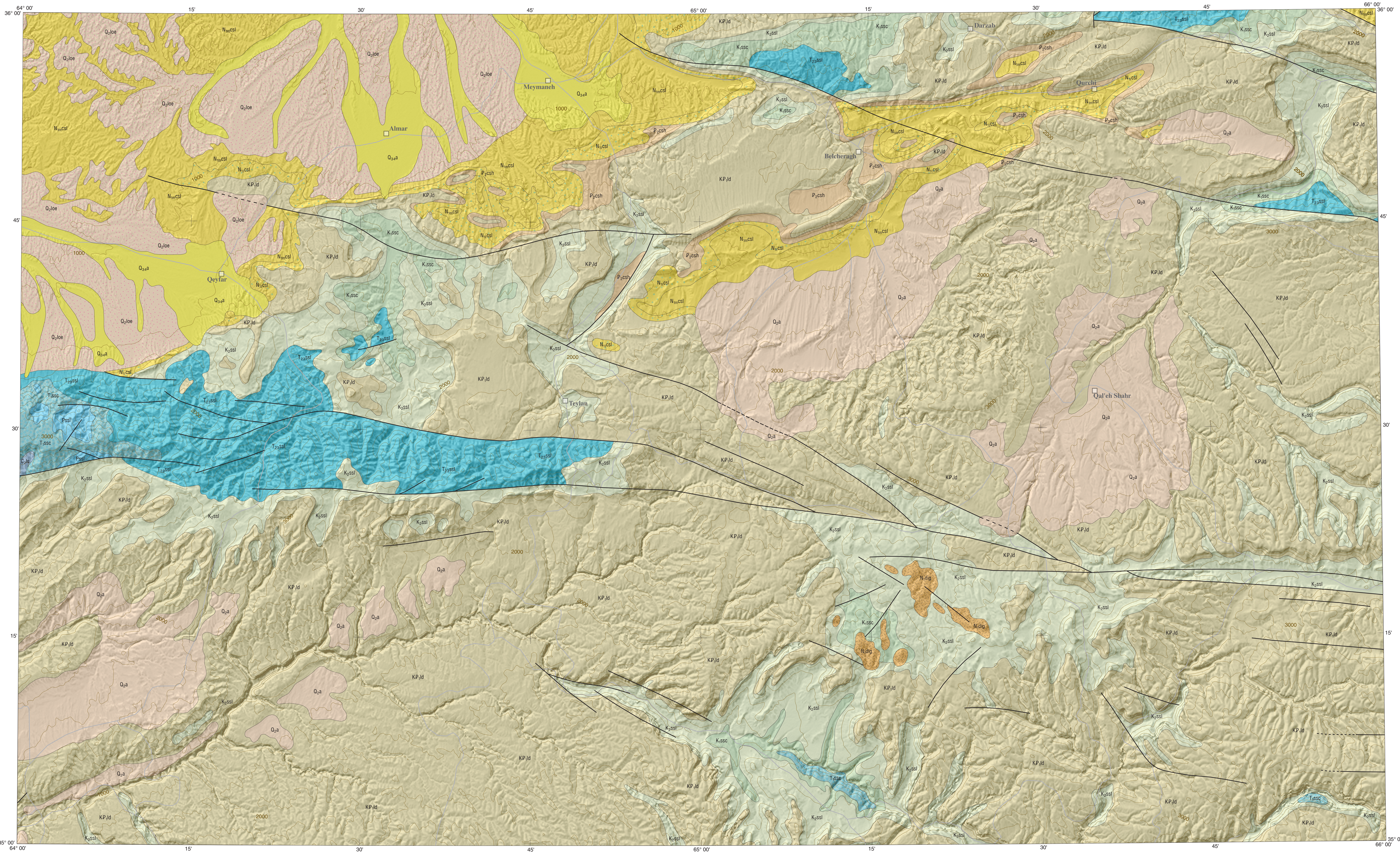
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

AFGHAN GEOLOGICAL SURVEY
Prepared in cooperation with the U.S. Geological Survey and the Afghanistan Geodesy and Cartography Head Office
Under the auspices of the U.S. Agency for International Development and the U.S. Trade and Development Agency

USGS OPEN-FILE REPORT 2005-1099-A
AGS OPEN-FILE REPORT (405/406) 2005-1099-A
USGS Afghanistan Project Product No. 017

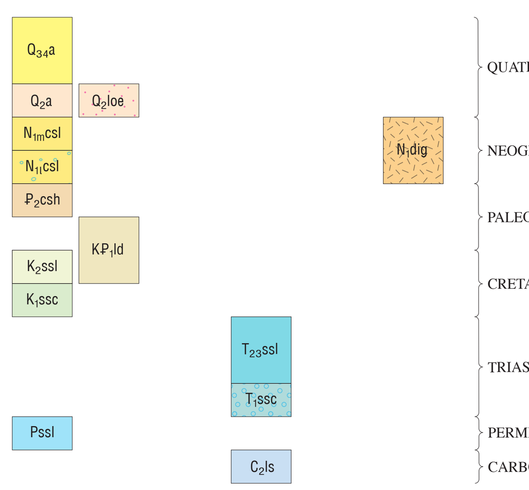


Base from Shuttle Radar Topography Mission (SRTM) 85-meter digital data
Cultural data from digital files from AIMS Web site (http://www.aims.org.af)
Projection: Universal Transverse Mercator, zone 41, WGS 84 Datum

SCALE 1:250 000
5 0 5 10 15 20 25 30 35 40 KILOMETERS
5 0 5 10 15 20 MILES
CONTOUR INTERVAL 100 METERS

Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

$Q_{34}a$ **Conglomerate and sandstone (Holocene and late Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

Q_2a **Conglomerate and sandstone (middle Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

Q_2loe **Loess (middle Pleistocene)**—Loess more abundant than sand, clay

$N_{1m}csl$ **Conglomerate and siltstone (middle Miocene)**—Brown clay, siltstone more abundant than sandstone, conglomerate, limestone

$N_{1l}csl$ **Conglomerate and siltstone (early Miocene)**—Red clay, siltstone more abundant than sandstone, conglomerate, limestone

N_1dig **Diorite and granodiorite (Miocene)**—Diorite and granodiorite, diorite porphyry, granodiorite porphyry, monzonite porphyry, syenite porphyry, nepheline syenite

Ᵽ$_2$csh **Clay and shale (Eocene)**—Clay, shale, siltstone more abundant than sandstone, limestone, marl, gypsum, conglomerate

KᵽP$_1$ld **Limestone and dolomite (Paleocene and Late Cretaceous)**—Limestone, marl, dolomite more abundant than sandstone, clay, siltstone, gypsum, conglomerate

K_2ssl **Sandstone and siltstone (Late Cretaceous)**—Sandstone, siltstone more abundant than clay, limestone, marl, conglomerate, gypsum

K_1ssc **Sandstone and conglomerate (Early Cretaceous)**—Red sandstone, conglomerate more abundant than siltstone, gypsum, clay

$T_{23}ssl$ **Sandstone and siltstone (Late and Middle Triassic)**—Sandstone and siltstone more abundant than mudstone, carbonaceous shale, limestone, marl, conglomerate, acid and mafic volcanic rocks

T_1ssc **Sandstone and conglomerate (Early Triassic)**—Variegated sandstone, gravelstone, conglomerate, chert, rhyolite and basalt volcanic rocks

Pssl **Sandstone and siltstone (Permian)**—Red and variegated sandstone and siltstone more abundant than mudstone, conglomerate, gravelstone

C_2ls **Limestone (Late Carboniferous)**—Limestone more abundant than slate, sandstone, conglomerate, siltstone, andesite to basalt volcanic rocks

EXPLANATION OF MAP SYMBOLS

Contact

Fault—Dashed where approximately located; dotted where concealed

DATA SUMMARY

This map was produced from several larger digital datasets. Topography was derived from Shuttle Radar Topography Mission (SRTM) 85-meter digital data. Gaps in the original dataset were filled with data digitized from contours on 1:200,000-scale Soviet General Staff Sheets (1978–1997). Contours were generated by cubic convolution averaged over four pixels using TNTmips[1] surface-modeling capabilities. Cultural data were extracted from files downloaded from the Afghanistan Information Management Service (AIMS) Web site (http://www.aims.org.af). The AIMS files were originally derived from maps produced by the Afghanistan Geodesy and Cartography Head Office (AGCHO). Geologic data and the international boundary of Afghanistan were taken directly from Abdullah and Chmyriov (1977).

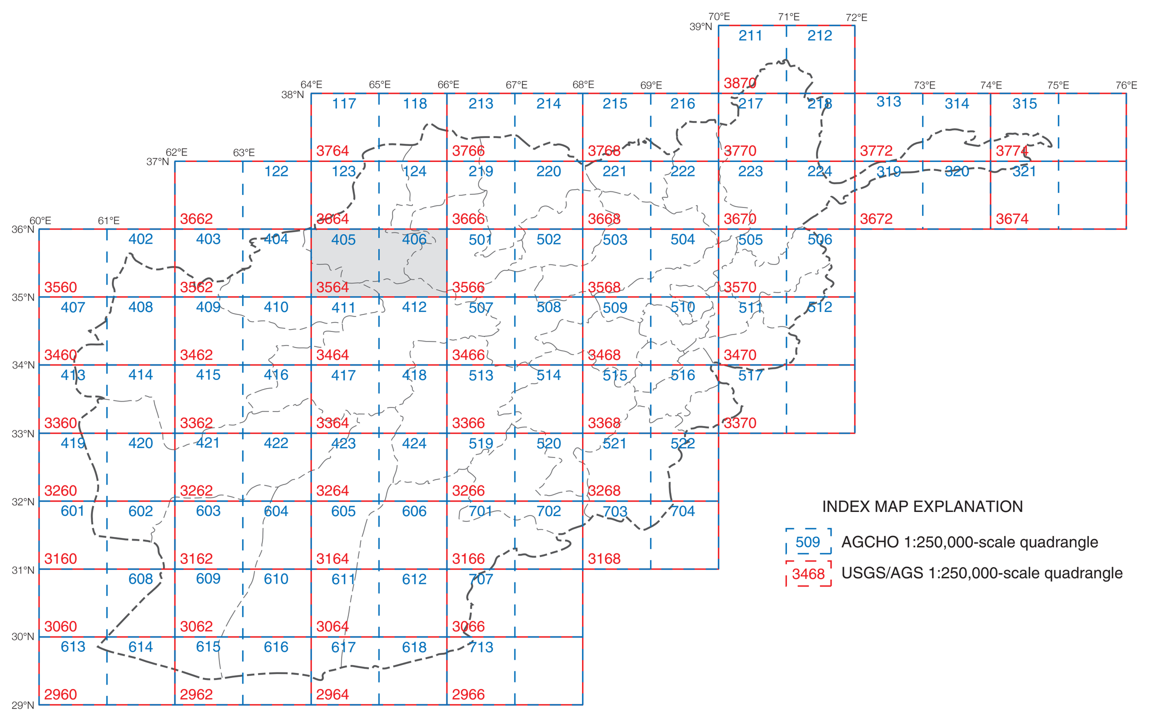
It is the primary intent of the U.S. Geological Survey (USGS) to present the geologic data in a useful format while making them publicly available. These data represent the state of geologic mapping in Afghanistan as of 2005, although the original map was released in the late 1970s (Abdullah and Chmyriov, 1977). The USGS has made no attempt to modify original geologic map-unit boundaries and faults; however, modifications to map-unit symbology, and minor modifications to map-unit descriptions, have been made to clarify lithostratigraphy and to modernize terminology. The generation of a Correlation of Map Units (CMU) diagram required interpretation of the original data, because no CMU diagram was presented by Abdullah and Chmyriov (1977).

This map is part of a series that includes a geologic map, a topographic map, a Landsat natural-color-image map, and a Landsat false-color-image map for the USGS/AGS (Afghan Geological Survey) quadrangles shown on the index map. The maps for any given quadrangle have the same open-file number but a different letter suffix, namely, -A, -B, -C, and -D for the geologic, topographic, Landsat natural-color, and Landsat false-color maps, respectively. The present map series is to be followed by a second series, in which the geology is reinterpreted on the basis of analysis of remote-sensing data, limited fieldwork, and library research. The second series is to be produced by the USGS in cooperation with the AGS and AGCHO.

REFERENCE CITED

Abdullah, Sh., and Chmyriov, V.M., eds., 1977, Map of mineral resources of Afghanistan: Kabul, Ministry of Mines and Industries of the Democratic Republic of Afghanistan, Department of Geological and Mineral Survey, V/O "Technoexport" USSR, scale 1:500,000.

[1]Geospatial analysis software developed by MicroImages, Inc., Lincoln, NE 68508-2010.



INDEX MAP EXPLANATION
509 AGCHO 1:250,000-scale quadrangle
3468 USGS/AGS 1:250,000-scale quadrangle

GEOLOGIC MAP OF QUADRANGLE 3564, CHAHRIAQ (JOAND) (405) AND GURZIWAN (406) QUADRANGLES, AFGHANISTAN

Compiled by
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2005

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