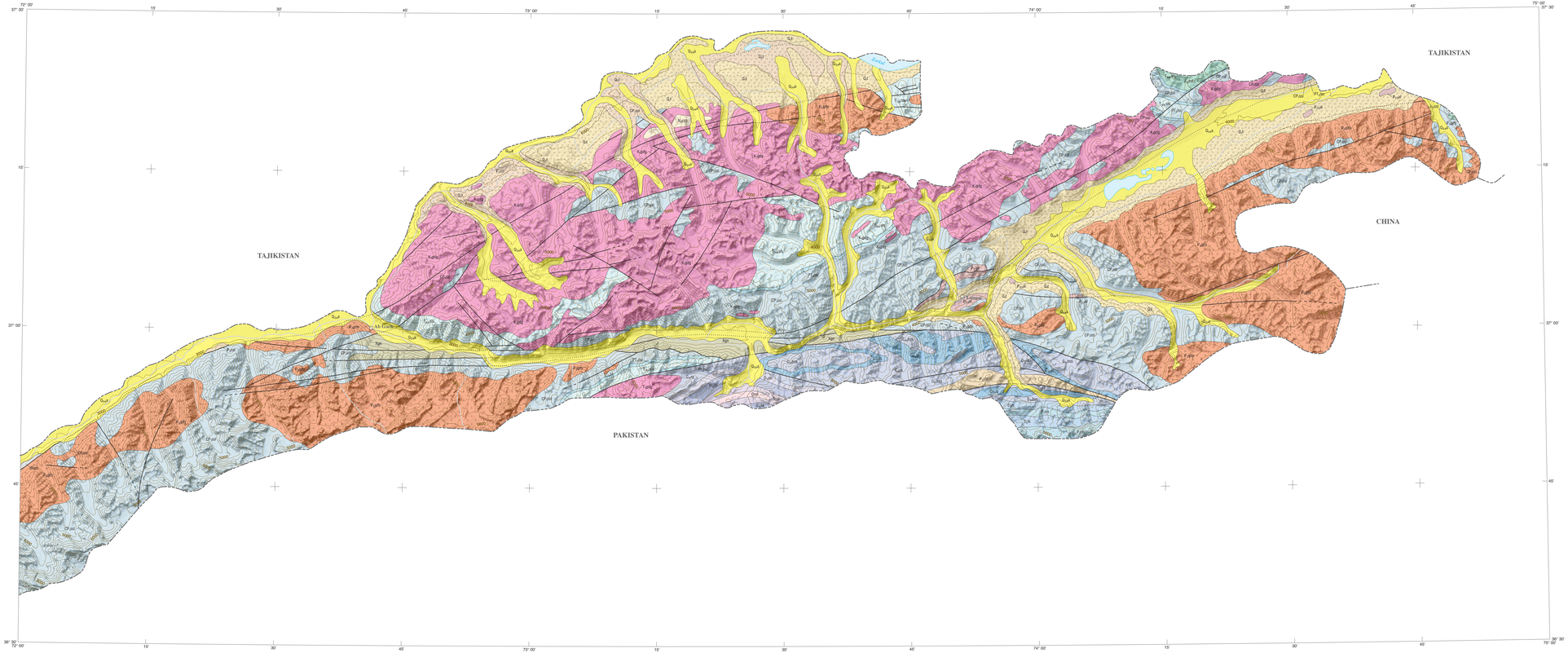
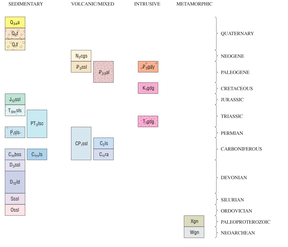
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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 2005-1097-A
AGS OPEN-FILE REPORT (313/314/315/319/320/321) 2005-1097-A
USGS Afghanistan Project Product No. 018



CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qun,fl—**Conglomerate and sandstone (Holocene and late Pleistocene)**—Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay

Qgl—**Till (middle Pleistocene)**—Till: conglomerate, shingly sediments, gravel, sand, siltstone, breccia

Qpl—**Till (early Pleistocene)**—Till: conglomerate, shingly sediments, gravel, sand, siltstone, breccia

Ncgs—**Conglomerate and sandstone (Pliocene)**—Gray conglomerate, grit, sandstone more abundant than siltstone, clay, limestone, marl; gypsum, salt; acid to mafic volcanic rocks

Pgsl—**Sandstone and siltstone (Oligocene)**—Sandstone, siltstone more abundant than clay, conglomerate, limestone, marl; acid and mafic volcanic rocks

Pgdg—**Granodiorite and granosyenite (Oligocene)**—Granodiorite, alaskite, granosyenite more abundant than granite (Phase II)

Pvsa—**Andesite lava (Oligocene and Eocene)**—Basaltic andesite, basalt, trachyte, dacite, rhyolite, ignimbrite, tuff; conglomerate, sandstone, siltstone, limestone

Kgdg—**Granodiorite and granite (Early Cretaceous)**—Granodiorite, granite

Cgsltl—**Sandstone and siltstone (Middle and Early Jurassic)**—Limestone, marl, sandstone, shale, siltstone

TsgvSS—**Siltstone and sandstone (Late Triassic (Rhaetian and Norian))**—Siltstone, sandstone more abundant than shale, conglomerate

PTslc—**Limestone and chert (Late Triassic (Carnian) and Permian)**—Limestone, marl, chert more abundant than sandstone, shale, siltstone

Tgdg—**Granodiorite and granite (Early Triassic)**—Granodiorite, granite (Phase I-II)

Pysls—**Siltstone and sandstone (Early Permian)**—Limestone

CPpsl—**Sandstone and siltstone (Early Permian and Carboniferous)**—Sandstone and siltstone more abundant than slate, andesite to basalt volcanic rocks

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

CvDstn—**Sandstone (Early Carboniferous (Namurian))**—Sandstone, siltstone, shale

Cv,lls—**Limestone (Early Carboniferous (Visean and late Tournaisian))**—Limestone more abundant than slate, sandstone, mudstone, conglomerate

Cv,rlv—**Rhyolite to andesite (Early Carboniferous (early Tournaisian))**—Rhyolite to andesite (greenstone altered) more abundant than sandstone, shale, siltstone

Dvsltl—**Sandstone and siltstone (Late Devonian)**—Sandstone and siltstone more abundant than limestone

Dvlmlt—**Limestone and dolomite (Middle and Early Devonian)**—Limestone and dolomite more abundant than sandstone, siltstone

Sssl—**Sandstone and siltstone (Silurian)**—Sandstone, siltstone, shale

Ossl—**Sandstone and siltstone (Ordovician)**—Limestone, sandstone, siltstone

Xgn—**Gneiss (Paleoproterozoic)**—Two-mica, biotite, biotite-amphibole, garnet-biotite, and plagioclase gneiss; migmatite, quartzite, marble, amphibolite

Wgn—**Gneiss (Neoarchean)**—Biotite, garnet-biotite, sillimanite-biotite, amphibole, and biotite-amphibole gneiss; amphibolite

EXPLANATION OF MAP SYMBOLS

Contact

Fault—Dashed where approximately located; dotted where concealed

Lake

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® 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).

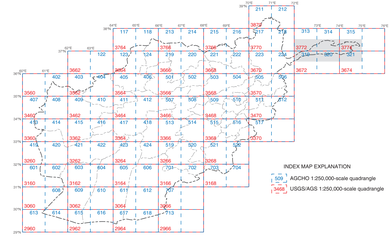
It is the primary intent of the U.S. Geological Survey (USGS) to present the geologic data in a useful format while making them publicly available. These data represent the state of geologic mapping in Afghanistan as of 2005, although the original map was released in the late 1970s (Abdullah and Chmyriov, 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 1(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.

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



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 43, 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 250 METERS

GEOLOGIC MAP OF QUADRANGLES 3772, 3774, 3672, AND 3674, GAZ-KHAN (313), SARHAD (314), KOL-I-CHAQMAQTIN (315), KHANDUD (319), DEH-GHULAMAN (320), AND ERTFAH (321) QUADRANGLES, AFGHANISTAN

Compiled by
Charles R. Lindsay

2005

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