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 2006-1038
AGS OPEN-FILE REPORT 2006-1038
Version 2
USGS Afghanistan Project Product No. 072

GEOLOGIC AND MINERAL RESOURCE MAP OF AFGHANISTAN

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2006

Version 2

SCALE 1:850 000

0 10 20 30 40 50 60 70 80 90 100 KILOMETERS
0 10 20 30 40 50 MILES



DESCRIPTION OF MAP UNITS

Layered Rocks

Qsa **Late deposits (Holocene)**—Intermittent lake; wet playa deposits

Qal **Conglomerate and sandstone (Holocene)**—Alluvium; shingly and detrital sediments, gravel, sand more abundant than silt and clay

Qsha **Playa deposits (Holocene)**—Mud, silt, and clay more abundant than sand; limestone and gypsum

Qsam **Salt marsh deposits (Holocene)**—Mud, silt, and clay more abundant than sand; limestone, gypsum, and salt

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

Qe **Eolian deposits (Holocene and late Pleistocene)**—Sand

Qsf **Till (Holocene and late Pleistocene)**—Till: conglomeratic, shingly sediments, gravel, sand, siltstone, breccia

Qsaf **Fan alluvium and colluvium (Holocene and late Pleistocene)**—Fan alluvium and colluvium: shingly and detrital sediments, gravel, sand, clay

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

Qsloe **Loess (late Pleistocene)**—Loess more abundant than sand, clay

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

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

Qf **Till (middle Pleistocene)**—Till: conglomeratic, shingly sediments, gravel, sand, siltstone, breccia

Qcb **Travertine (middle Pleistocene)**—Travertine

Qcbt **Alkaline lava (middle Pleistocene)**—Trachybasalt, leucite basanite (Darbagh series)

Qcbt **Basalt lava (middle Pleistocene)**—Basaltic andesite and olivine basalt (Ajapsan series)

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

Qsat **Andesite tuff (early Pleistocene)**—Andesite, dacite tuff and welded tuff (Ushtulsu-ar series)

Qsbt **Alkaline tuff (early Pleistocene)**—Phonolite and sanvite tuff and lava (Khanneshin series)

Qsf **Till (early Pleistocene)**—Till: conglomeratic, shingly sediments, gravel, sand, siltstone, breccia

Tcgs **Conglomerate and sandstone (Pliocene)**—Grey conglomeratic, grit, sandstone more abundant than siltstone, clay, limestone, marl; gypsum, salt; felsic to mafic volcanic rocks

Tcgsl **Conglomerate and sandstone (late Pliocene)**—Grey conglomeratic, grit, sandstone more abundant than siltstone, clay, limestone, marl; gypsum, salt; felsic to mafic volcanic rocks

Tcgsu **Sandstone and conglomerate (early Pliocene)**—Variegated sandstone, conglomeratic more abundant than clay, siltstone

Tcgp **Conglomerate and sandstone (late Miocene)**—Red conglomeratic, sandstone more abundant than siltstone, clay; felsic and mafic volcanic rocks; limestone, marl; olivine basalt, trachybasalt, andesitic basalt (Taywara series)

Tcgsl **Conglomerate and sandstone (late Miocene)**—Variegated conglomeratic, sandstone more abundant than grit, clay, siltstone

Tcsl **Clay and siltstone (middle Miocene)**—Brown clay, siltstone more abundant than sandstone, conglomeratic, limestone

Tcsu **Clay and siltstone (early Miocene)**—Red clay, siltstone more abundant than sandstone, conglomeratic, limestone

Tcsu **Sandstone and siltstone (Oligocene)**—Sandstone, siltstone more abundant than clay, conglomeratic, limestone; marl; felsic and mafic volcanic rocks

Tv,Tsh **Volcanic and sedimentary rocks (Oligocene and Eocene)**—Basaltic andesite, andesite, and dacite lava and tuff; sandstone, siltstone, limestone

Tvpf **Rhyolite and dacite (Oligocene and Eocene)**—Rhyolite (lipatite), dacite more abundant than granite porphyry

Tvf **Rhyolite lava (Oligocene and Eocene)**—Rhyolite lava

Tva **Andesite lava (Oligocene and Eocene)**—Andesite lava

Tvt **Lava (Oligocene and Eocene)**—Lava

Tsh **Clay and shale (Eocene)**—Clay, shale, siltstone more abundant than sandstone, limestone, marl; gypsum; conglomerate (North Afghanistan: Katewaz basin); sandstone, siltstone, conglomeratic and gravelly; felsic and mafic volcanic rocks (Central basin)

Tvpf **Andesite lava (Eocene)**—Andesite lava

Tvpgs **Conglomerate and sandstone (Paleocene)**—Conglomeratic, sandstone more abundant than shale; mafic volcanic rocks

Tvpf **Basalt lava (Paleocene)**—Basalt lava

Tvpsl **Limestone and dolomite (Paleocene and late Cretaceous)**—Limestone, dolomite, marl; sandstone, siltstone, shale; gypsum, conglomerate more abundant than volcanic rocks

Tvpf,Kvpf **Andesite lava (Paleocene and Late Cretaceous)**—Andesite lava

Kvs, Kvv **Volcanic and sedimentary rocks (Cretaceous)**—Rhyolite to basalt; clastic fine- and coarse-grained terrigenous rocks, marl, limestone

Kva **Andesite lava (Cretaceous)**—Andesite lava

Kvt **Basalt lava (Cretaceous)**—Basalt lava

Kvtf **Tuff (Cretaceous)**—Tuff

Kvpf **Sandstone and siltstone (Late Cretaceous)**—Sandstone, siltstone more abundant than clay, limestone, marl; conglomeratic, gypsum (North Afghanistan); limestone (Middle Afghanistan); tesbisna, siltstone, conglomeratic (Ghaznbird zone)

Kvpsl **Volcanic and sedimentary rocks (Late Cretaceous (Maastrichtian))**—Basaltic andesite, basalt, andesitic ductite, tuff, limestone, marl, sandstone, siltstone

Kvpsl **Lava (Late Cretaceous (Maastrichtian))**—Andesite, basalt, andesitic ductite, tuff

Kvlm **Limestone and sandstone (Late Cretaceous (Campanian))**—Limestone, marl; sandstone more abundant than siltstone, clay, conglomeratic; andesitic basalt, tuff and tuffaceous conglomerate

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

Kvsm,lm **Limestone and sandstone (Early Cretaceous (Aptian and Albian))**—Limestone, marl, sandstone more abundant than conglomerate

Kvsm,ls **Sandstone and siltstone (Early Cretaceous (Hauterivian and Valanginian))**—Sandstone, siltstone more abundant than limestone, marl

Kvsm **Basalt (Early Cretaceous (Hauterivian and Valanginian))**—Basalt lava

Kvsm,ls **Sandstone and siltstone (Early Cretaceous (Valanginian and Berriasian))**—Sandstone, siltstone more abundant than limestone, marl

Kvsm,a **Andesite (Early Cretaceous (Valanginian and Berriasian))**—Andesite lava

Kvsm,b **Basalt (Early Cretaceous (Valanginian and Berriasian))**—Basalt lava

JsKvb **Shale and siltstone (Early Cretaceous–(Hauterivian) and Late Jurassic (Tithonian))**—Shale more abundant than siltstone; sandstone, conglomerate, chert, limestone; greenstone, felsic and mafic volcanic rocks

JsKvrl **Rhyolite (Early Cretaceous (Hauterivian) and Late Jurassic (Tithonian))**—Rhyolite lava

JsKvb **Basalt (Early Cretaceous (Hauterivian) and Late Jurassic (Tithonian))**—Basalt lava

Js **Shale (Jurassic)**—Shale and mudstone more abundant than limestone, sandstone

JsKgc **Conglomerate and sandstone (Late Jurassic)**—Conglomeratic, sandstone more abundant than siltstone, clay, limestone, gypsum (North Afghanistan); limestone, marl, sandstone, siltstone (Turaki Red basin, Upper Jurassic (Tithonian))

JsLm **Limestone (Late and Middle Jurassic)**—Limestone, marl

JsmLm **Sandstone and siltstone (Middle and Early Jurassic)**—Sandstone, siltstone more abundant than shale, marl, limestone; limestone, marl; limestone, marl, sandstone, shale, siltstone (Alabak–Afghanistan); sandstone, shale, siltstone, felsic volcanic rocks (Kermanan zone)

TrJsSh **Siltstone and shale (Middle Jurassic and Late Triassic)**—Siltstone, shale more abundant than sandstone

TrJsSs **Siltstone and sandstone (Early Jurassic and Late Triassic (Rhaetian))**—Siltstone, sandstone more abundant than shale, marl, limestone

TrJs **Limestone and shale (Triassic)**—Limestone, shale more abundant than sandstone

TrJsmb **Sedimentary and volcanic rocks (Late Triassic)**—Shale more abundant than phyllite, andesite to basalt (greenstone altered), limestone (Kotagai series)

TrJsrl **Rhyolite (Late Triassic)**—Rhyolite lava

TrJsb **Basalt lava (Late Triassic)**—Basalt lava

TrJsrh **Rhyolite and sandstone (Late Triassic (Rhaetian))**—Rhyolite and basalt more abundant than sandstone, sandstone, conglomeratic, grit

TrJsrl **Rhyolite (Late Triassic (Rhaetian))**—Rhyolite lava

TrJsa **Andesite (Late Triassic (Rhaetian))**—Andesite lava

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

TrJsmd **Limestone and dolomite (Late Triassic (Norian and Carnian))**—Limestone, dolomite

TrJsmSs **Sandstone and siltstone (Late and Middle Triassic)**—Sandstone and siltstone more abundant than shale; carbonaceous shale, limestone, marl, conglomeratic; felsic and mafic volcanic rocks (North Afghanistan); limestone, dolomite, marl (Kabul block and Kunar zone)

TrJsd **Limestone and dolomite (Middle Triassic)**—Limestone, dolomite

TrJsmlSh **Limestone and dolomite (Late Triassic (Carnian) and Early Triassic)**—Limestone, dolomite more abundant than conglomerate, shale; shale, siltstone more abundant than sandstone, limestone, shale, conglomeratic, chert, mafic volcanic rocks (Chakrdesh zone); limestone, dolomite (Kermanan zone)

TrJsml **Limestone and dolomite (Middle and Early Triassic)**—Limestone, dolomite, marl

TrJsSc **Sandstone and conglomerate (Early Triassic)**—Variegated sandstone, grey/olive, conglomeratic, chert, rhyolite and basalt volcanic rocks (North Afghanistan)

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

Psd **Sandstone and siltstone (Permian)**—Red and variegated sandstone more abundant than shale, siltstone, conglomeratic; limestone, marl (near Chaghcharan–Afghanistan); limestone, dolomite, sandstone, siltstone, shale, phyllite; mafic volcanic rocks, breccia and basinite-bearing rocks (Middle Afghanistan–Zani and Kermanan zones, Katawaz trough)

PzPzl **Limestone and dolomite (Late Permian)**—Limestone, dolomite more abundant than marl; conglomeratic, sandstone, siltstone, shale, basinite and basinite-bearing rocks

PzSs **Siltstone and sandstone (Early Permian)**—Siltstone and sandstone more abundant than shale, limestone, conglomerate, grit (Oxfordian zone); limestone and sandstone more abundant than siltstone, conglomeratic

PzLm **Limestone and sandstone (Early Permian)**—Ulak and Kohsefaqandahar horizons; limestone and sandstone more abundant than siltstone, conglomeratic

PzLmSs **Limestone and sandstone (Early Permian)**—Karachatyr horizon; limestone and sandstone more abundant than siltstone, argillite, slate

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

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

Cvls **Volcanic and sedimentary rocks (Early Carboniferous)**—Rhyolite to basaltic volcanic rocks more abundant than limestone, slate; sandstone, conglomeratic

Cpfl **Rhyolite tuff (Early Carboniferous)**—Rhyolite tuff

Cpf **Basalt (Early Carboniferous)**—Basalt lava

Cpa **Andesite (Early Carboniferous)**—Andesite lava

Cpt **Lava (Early Carboniferous)**—Lava

Cpsm **Basalt and sandstone (Early Carboniferous (Namurian))**—Basalt, andesite, rhyolite volcanic rocks; limestone, sandstone, siltstone, shale (Tashkepruk and Kunar zones)

Cpfl **Basalt tuff (Early Carboniferous (Namurian))**—Basalt tuff

Cpf **Basalt lava (Early Carboniferous (Namurian))**—Basalt lava

Cpa **Lava (Early Carboniferous (Namurian))**—Lava

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

Cpvls **Rhyolite to andesite (Early Carboniferous (early Tournaisian))**—Rhyolite to andesite (greenstone altered) more abundant than sandstone, slate, siltstone

Cpvf **Rhyolite lava (Early Carboniferous (early Tournaisian))**—Rhyolite lava

Cpva **Lava (Early Carboniferous (early Tournaisian))**—Lava

DSd **Limestone and dolomite (Early Carboniferous and Late Devonian)**—Limestone and dolomite more abundant than marl, schist

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

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

SDd **Limestone and dolomite (Devonian and Silurian)**—Limestone and dolomite more abundant than schist, sandstone

Sls **Limestone (Silurian)**—Limestone, marl more abundant than slate (Middle Afghanistan); sandstone, siltstone, shale (Logar and Aqaqdah zones)

Sosd **Sandstone and siltstone (Ordovician)**—Sandstone and siltstone more abundant than shale (Logar and Aqaqdah zones); limestone, siltstone, shale (Middle Afghanistan); shale, sandstone, chert (North Afghanistan)

Cmls **Limestone and siltstone (Cambrian)**—Sandstone and siltstone more abundant than limestone, dolomite; mafic volcanic rocks

ZCm **Limestone and dolomite (Cambrian–Ediacaran) and Neoproterozoic)**—Limestone and dolomite (Aqaqdah zone); marble, quartzite, metasandstone, mica schist (Kabul block)

Zvls **Metavolcanic rhyolite and andesite (late Neoproterozoic)**—Red altered rhyolite and andesite volcanic rocks more abundant than sandstone, siltstone, limestone, dolomite

Zsl **Lava (late Neoproterozoic)**—Lava

Zmsc **Schist and phyllite (early Neoproterozoic)**—Greenschist and phyllite derived from slate, schist, sandstone more abundant than metavolcanics (marble, dolomite, chert) and metavolcanic rocks

LpEvl **Metavolcanic rhyolite lava (early Neoproterozoic)**—Metavolcanic rhyolite lava

EpEa **Metavolcanic andesite lava (early Neoproterozoic)**—Metavolcanic andesite lava

Ym **Metamorphic rocks, undifferentiated (Mesoproterozoic)**—Gneiss: schist, gneiss, quartzite, marble, amphibolite (metavolcanic lava and sedimentary rocks)

MZvl **Metavolcanic lava and sediments (Mesoproterozoic)**—Metavolcanic lava and sedimentary rocks

Ysm **Schist (late Mesoproterozoic)**—Quartz plagioclase biotite, biotite, muscovite, and two-mica schists, with amphibolite beds and lenses

Ysm **Schist (middle Mesoproterozoic)**—Albite-sericite-quartz and sericite-plagioclase-quartz schists, with amphibolite beds and lenses

Ysm **Schist (early Mesoproterozoic)**—Quartz-sericite carbonate and chlorite-sericite-quartz schists; marble, quartzite, amphibolite

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

YgEgn **Gneiss (late Paleoproterozoic)**—Biotite gneiss and garnet-biotite gneiss; schist, quartzite, marble, amphibolite

YgEmg **Marble and gneiss (middle Paleoproterozoic)**—Marble, biotite gneiss, and garnet-staurolite-biotite gneiss; schist, quartzite, amphibolite

YgEv **Metavolcanic lava (middle Paleoproterozoic)**—Metavolcanic lava

YgEn **Gneiss (early Paleoproterozoic)**—Two-mica, biotite, biotite-amphibole, and garnet-biotite gneisses; migmatite, quartzite, amphibolite; amphibolite, plagioclase, and zoisite/epidote gneisses; schist, migmatite, quartzite, marble, amphibolite

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

Ygn **Gneiss (Mesoarchean)**—Biotite, garnet-biotite, amphibole, biotite-amphibole, and calc-silicate gneisses; migmatite, quartzite, amphibolite

Ygnu **Gneiss (Paleoarchean)**—Biotite, garnet-biotite, and injection gneisses; amphibolite

Plutonic Rocks

Cvls **Carbonatite (early Pleistocene)**—Carbonatite dikes

Cbx **Carbonatite (early Pleistocene)**—Carbonatite intrusion

Rpf **Rhyodacite (early Pleistocene)**—Rhyodacite (lipatite–dacite)

Nenf **Nepheline syenite (Miocene)**—Nepheline syenite

Kvd **Andesite and diorite (Miocene)**—Andesite, diorite more abundant than diabase porphyry dikes

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

Tgr **Granite (Oligocene)**—Granite (Phase III)

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

TgEgr **Granodiorite (Oligocene)**—Granodiorite (Phase I)

TgEdr **Diorite and plagiogranite (Oligocene)**—Diorite and plagiogranite more abundant than granodiorite (Phase I)

TvEdr **Granite and granodiorite (Oligocene)**—Granite, granite porphyry, granodiorite more abundant than quartz syenite, granosyenite

TvEdm **Diabase and diorite intrusions (Eocene)**—Diabase, diorite

EpmU **Ultramafic intrusions (Eocene)**—Dunite, peridotite, serpentinite

MZgbm **Gabbro and monzonite (Paleocene and Late Cretaceous)**—Gabbro, monzonite more abundant than diorite, granite, granosyenite, syenite porphyry, syenite

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

KvEdm **Gabbro and diorite (Early Cretaceous)**—Gabbro, diorite more abundant than plagiogranite

Kgbm **Gabbro and monzonite (Early Cretaceous)**—Gabbro: monzonite more abundant than diorite, granodiorite

KvmU **Ultramafic intrusions (Early Cretaceous)**—Dunite, peridotite, serpentinite

LKvDb **Diabase and gabbrodiabase (Early Cretaceous and Late Jurassic)**—Diabase, gabbrodiabase

TgEb **Granodiorite and granosyenite (Late Triassic)**—Granodiorite, granosyenite, granophyre, granite

TvEgd **Andesite and granite porphyry (Late Triassic)**—Andesite porphyry, granite porphyry

TgEgr **Granite and granosyenite (Early Triassic)**—Granite, granosyenite (Phase IV)

Tgr **Granite (Early Triassic)**—Granite (Phase III)

TgEgr **Granodiorite and granite (Early Triassic)**—Granodiorite, granite (Phase I–II)

PzGr **Diorite and gabbrodiorite (Permian)**—Diorite, gabbrodioritic plagiogranite

PzGb **Gabbros and diorite (Permian)**—Gabbro, gabbrodioritic diorite

PzmU **Ultramafic intrusions (Permian)**—Ultramafic rocks

CpEdg **Diorite and granodiorite (Early Carboniferous)**—Diorite, granodiorite more abundant than granophyre, plagiogranite

CpEdb **Gabbros and diorite (Early Carboniferous)**—Gabbros, diorite

CpmU **Ultramafic intrusions (Early Carboniferous)**—Dunite, peridotite, serpentinite

Dgr **Granodiorite and granite (Devonian)**—Granodiorite, granite

Dgp **Granite porphyry (Neoproterozoic)**—Granite porphyry

YpzGr **Gneiss and granite (Proterozoic)**—Gneiss granite, granite, plagiogranite

EpmGb **Gabbro and mafic metavolcanics (Proterozoic)**—Gabbro, metadiabase, amphibolite, diorite, plagiogranite

EXPLANATION OF GEOLOGIC MAP SYMBOLS

Fault—Dashed where approximately located, dotted where concealed

Lake or reservoir

EXPLANATION OF POLITICAL MAP SYMBOLS

KABUL **National capital**

HERAT **Provincial capital**

National boundary

Provincial boundary

BALKH **Province name**

DESCRIPTION OF MINERAL SYMBOLS
Deposit Types

METALLIC MINERALS

- Vein gold, undivided
- Skarn gold (± copper)
- Unclassified gold
- Sediment-hosted copper
- Porphyry copper(?)
- Skarn copper
- Unclassified copper
- Volcanogenic massive sulfide (copper-zinc)
- Vein polymetallic
- Skarn zinc-lead
- Mississippi Valley-type lead-zinc
- Unclassified lead-zinc
- Iron formation
- Oolitic ironstone
- Skarn iron
- Kiruna-type iron oxide (copper-gold±U)
- Vein hematite
- Unclassified iron
- Unclassified manganese
- Podiform chromite
- Greisen tin
- Stock-work tin
- Vein tin
- Skarn tin
- Unclassified tin
- Greisen tungsten
- Vein tungsten
- Skarn tungsten
- Unclassified tungsten
- Unclassified molybdenum
- Unclassified mercury
- Pegmatite (beryllium, lithium, tantalum; gem-quality minerals)
- Carbonatite (uranium, rare-earth elements)

NONMETALLIC MINERALS

- Bedded barite
- Vein barite
- Unclassified barite
- Bedded celestite
- Unclassified fluorite
- Salt dome
- Bedded marine halite
- Lacustrine halite
- Unclassified halite
- Bedded marine gypsum
- Lacustrine gypsum
- Unclassified gypsum
- Sulfur
- Aggregate
- Aragonite
- Limestone
- Marble
- Calcite (Iceland spar)
- Sedimentary kaolin
- Residual kaolin
- Sedimentary bentonite
- Unclassified clay
- Unclassified phosphate
- Karst-type bauxite
- Laterite-type bauxite
- Metasomatic/metamorphic replacement magnesite
- Ultramafic-hosted talc
- Serpentine-hosted asbestos
- Unclassified graphite
- Quartz pegmatites and veins
- Silica sandstone
- Unclassified silica

PRECIOUS AND SEMI-PRECIOUS MINERALS

- Emerald
- Ruby
- Lapis lazuli
- Garnet
- Epidote

PLACER MINERALS

- Placer gold
- Placer tin

ENERGY MINERALS

- Coal
- Peat
- Petroleum, oil
- Petroleum, oil show
- Petroleum, gas
- Petroleum, gas show
- Petroleum, oil and condensate, show
- Petroleum, oil show and gas show
- Oil shale

DATA SUMMARY

The geologic and mineral resource information shown on this map is derived from digitization of the original data from Abdullah and Chmyriov (1977) and Abdullah and others (1977). The U.S. Geological Survey (USGS) has made no attempt to modify original geologic map-unit boundaries and faults as presented in Abdullah and others (1977). Geologic map-unit descriptions have been simplified and abbreviated to conform to map-unit descriptions, have been made to clarify lithostratigraphy and to modernize terminology. Labeling of map units has not been attempted where they are small or narrow, in order to maintain legibility and to preserve the map's utility in illustrating regional geologic and structural relations. Users are encouraged to refer to the publication by Abdullah and others (1977) for more detail. The mineral resource data are a single snapshot of knowledge that are being released consistently as open-file reports.

The classification of mineral deposit types is based on the authors' interpretation of existing descriptive information (Abdullah and others, 1977; Bowersox and Chamberlain, 1995; Orris and Bliss, 2002) and on limited field investigations by the authors. Deposit-type nomenclature used for nonfuel minerals is modified from published USGS deposit-model classifications, as compiled in Bowersox and Hetan (2004). New deposit models were developed for deposits in Afghanistan (Orris and Bliss, 2002).

The shaded-relief base is derived from Shuttle Radar Topography Mission (SRTM) digital elevation model (DEM) data having 85-meter resolution. Gaps in the original SRTM DEM dataset were filled with data digitized from contours on 1:250,000-scale Soviet General Staff Sheets (1978–1997). The mergered extent of geologic-unit coverages is the portion of the international boundary as defined by Abdullah and Chmyriov (1977), and the international boundary as shown on this map is as agreed upon by the Afghan Transitional Administration and Pakistan in March 2002 (http://www.state.org.pk) on September 2005. Non-coincidence of these boundaries is due to differences in the respective data sources and to inexact registration of the geologic data to the DEM base. Province boundaries, province capital locations, and political names were also acquired from the ADAS Web site in September 2005. The base map was compiled and digitized by the Afghanistan Geodesy and Cartography Head Office (AGCHO).

Version 2 differs from Version 1 in that (1) map units are colored according to the color scheme of the Commission for the Geological Map of the World (CGMW) (http://www.cgmw.org), (2) the minerals database has been updated, and (3) all data presented on the map are also available as GIS format.

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Transverse Mercator projection, WGS 84 Datum, scale factor 1.00000, longitude of central meridian 66°00' E., latitude of origin 34°30' N.

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