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

Prepared in cooperation with the
Afghan Geological Survey
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OPEN-FILE REPORT 2014–1119–B
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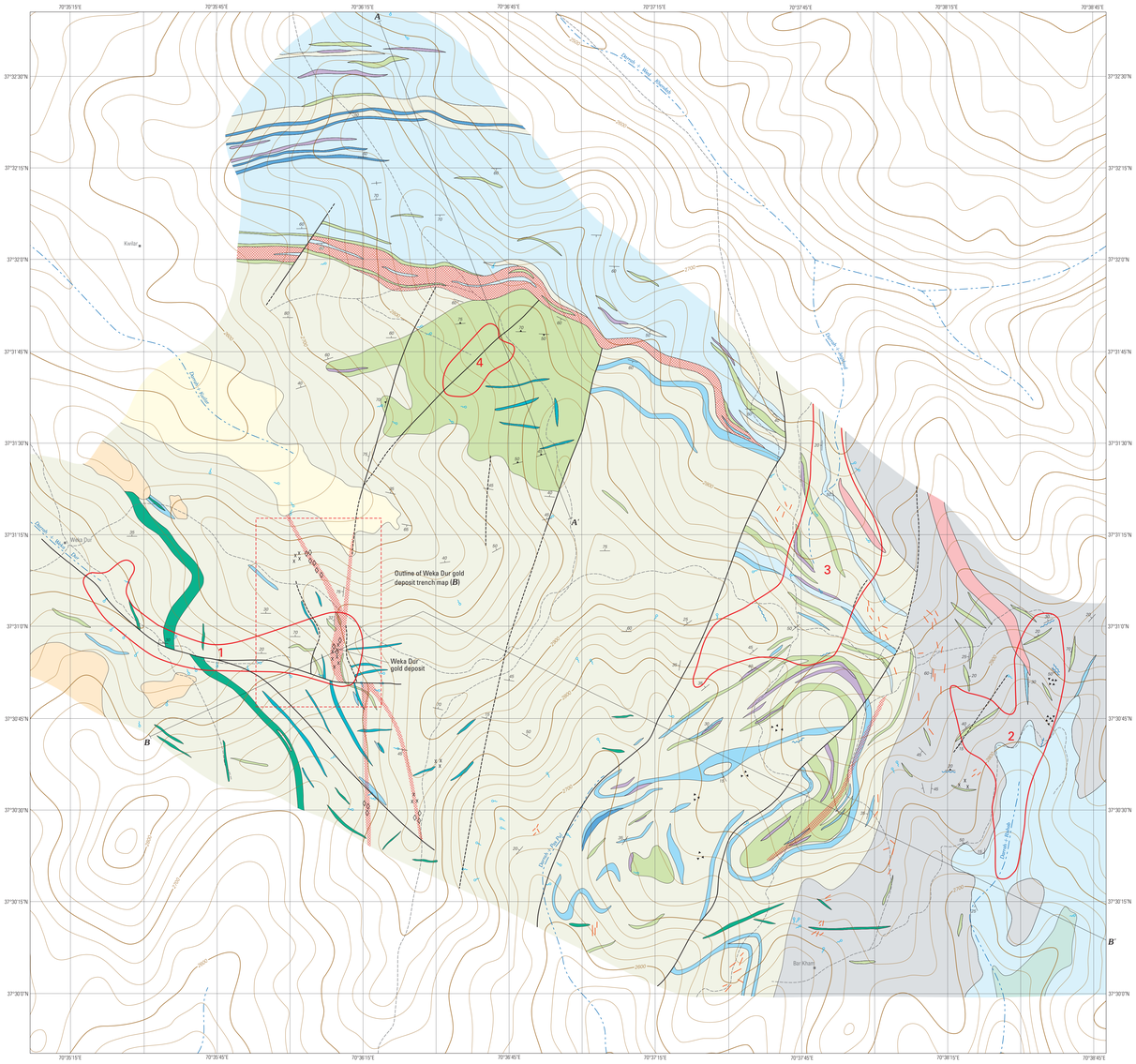


Topography and hydrography derived from Advanced Spaceborne Thermal Emission and Reflection (ASTER) 30-meter Global Digital Elevation Model (GDEM) data, 2009
Projection and grid: Universal Transverse Mercator (UTM), zone 42 north
World Geodetic System (WGS) 1984 Datum

APPROXIMATE MEAN DECLINATION, 2014

SCALE 1:10 000
1 0 1/2 0 1 MILE
1 0 1 KILOMETER
CONTOUR INTERVAL 25 METERS

Modified from original compilation of Guguev and others (1967); see References Cited

A.—Geologic map of the Weka Dur prospect area.

DESCRIPTION OF MAP UNITS

- Holocene fluvial deposits
- Lower Quaternary to Tertiary conglomerate, loam with porous limestone interbeds
- Marble
- Mica-feldspar-quartz schist, gneissic
- Greenstone schist: chlorite-actinolite, albite-tremolite, serpentine-chlorite
- Quartz-mica schist: quartz-muscovite, quartz-chlorite-sericite, biotite-muscovite
- Amphibolite and amphibole-epidote schist
- Serpentinite
- Quartz-oligoclase gneiss
- Carbonate-serpentine-actinolite-talc rocks of shear zones
- Gabbro

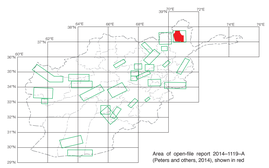
DIKES AND VEINS

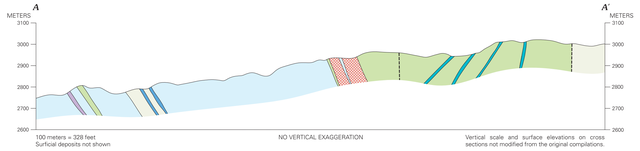
- Diabase, albite, hornblende
- Microgabbro-diorite

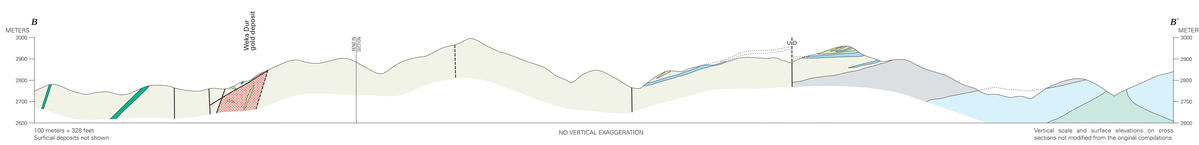
EXPLANATION OF MAP SYMBOLS

- Contact—In cross section ***B–B'***, shown dotted where inferred
- Fault—Dashed where inferred
- Quartz talus
- Carbonatization
- Silicification
- Strike and dip of bedding
  - Inclined
  - Vertical
- Strike and dip of schistosity
- Quartz vein
- Mica-quartz-albite veins
- Zone of crushing and hydrothermal alteration of rocks
- Heavy concentration aureole with anomalous gold content (greater than 15 grains per heavy concentrate): 1. Weka Dur; 2. Rishab; 3. Pas Pul, Jegdhal; 4. Kwlar
- Outline of Weka Dur gold deposit trench map
- Spring
- Road or trail
- Town or village

LOCATION DIAGRAM







INTRODUCTION

These maps are a redrafted and modified version of the *Geological map of the Weka Dur area*, scale 1:10,000 and *Geological map of the Weka Dur deposit*, scale 1:2,000 (Guguev and others, 1967). The original maps and cross sections are contained in an unpublished Soviet report (no. R1584), prepared in cooperation with the Ministry of Mines and Industries of the Republic of Afghanistan in 1967.

The Weka Dur gold deposit lies in a cluster of other gold deposits in Badakhshan Province (Ragh district), such as the Kadar, Nesheb Dur, and Rishaw gold occurrences (Bothmann, 1953) (fig. 1). These gold occurrences lie within a zone of late Hercynian folding and are most likely related to fluids that originated from orogenic processes (Peters and others, 2007). The Kadar (Kalar) occurrence is hosted in early Triassic granodiorite in a 400-m-long, 20- to 70-m-wide shear zone that contains numerous quartz veinlets with disseminated pyrite and chalcopyrite and grades of 0.1 to 1.6 grams per ton (g/t) gold. The Nesheb Dur occurrence is in weathered Proterozoic gneiss and contains three 120- to 360-m-long, 1.5- to 4.0-m-wide quartz veins containing galena, sphalerite, arsenopyrite, pyrite, and chalcopyrite and grades of 0.2 to 1.1 g/t gold. The Rishaw occurrence is hosted in Lower Carboniferous limestone marble and consists of a 400-m-long, 0.6- to 2.3-m-wide quartz vein that grades up to 5 g/t gold (Semenov and others, 1967). The Weka Dur deposit is the largest recorded gold occurrence in Afghanistan and is hosted in Proterozoic mica schist and amphibolite that is intruded by diabase dikes and other intrusive rocks (Peters and others, 2011; King and others, 2011). The tabular orebody is 350 m long and 2 m wide and can be traced downdip for 110 m. Mineralization consists of ochreous, brecciated schists containing high gold concentrations along gently and steeply dipping fissures. The brecciated rocks grade to 46.7 g/t silver and contain arsenopyrite, galena, chalcopyrite, and scheelite. Trenches and adits were constructed, mapped, and sampled during the 1960s (fig. 2). Calculated resources are 958.3 kilograms of gold, averaging 4.1 g/t gold (Nazarov and others, 1965; Guguev and others, 1967).

The unit colors on the map and cross sections differ from the colors shown on the original version. The units are colored according to the color and pattern scheme of the Commission for the Geological Map of the World (CGMW) (http://www.cgmw.org).

This map reproduces the topology (contacts, faults, and so forth) of the original Soviet maps and cross sections. Elevations on the cross sections are derived from the original Soviet topography and may not match the Global Digital Elevation Model (GDEM) topography used on the current map. We have attempted to translate the original Russian terminology and rock classification into modern English geologic usage as literally as possible without changing any genetic or process-oriented implications in the original descriptions. The map-unit descriptions are from the original Russian map "legend."

Photographs were taken by Barney Gimbel and Emily Scott of the Task Force for Business and Stability Operations (U.S. Department of Defense) and by James Gilbertson of SRK Consulting during 2011 field visits (figs. 3–8).

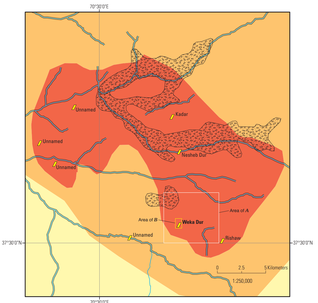


Figure 1.—Map of the Ragh district showing the Kadar, Nesheb Dur, Rishaw, and Weka Dur deposits, as well as several unnamed deposits. The location of the Weka Dur prospect area, mapped at a scale of 1:10,000, is shown enclosed within the white outline (**A**). Within the yellow outline is a smaller part of the Weka Dur area at a scale of 1:2,000, shown on **B**. The cluster of gold deposits in this portion of Badakhshan Province, except for one unnamed deposit, lies within the prospective gold deposit area shown. Also shown are local streams and Neogene gravels that contain potential placer gold.

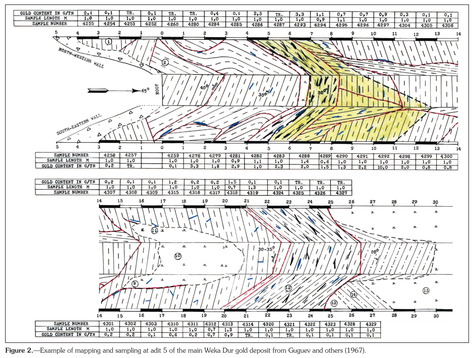


Figure 2.—Example of mapping and sampling at adit 5 of the main Weka Dur gold deposit from Guguev and others (1967).

EXPLANATION

- Unconsolidated material
- Muscovite-quartz schist
- Sericite-quartz schist
- Massive chlorite-quartz carbonized rock
- Limonitization
- Quartz
- 1. Faults. 2. Shear zone
- Mylonitization zone
- Channel sample
- Specimen and its number
- Strike and dip: 1. Bedding; 2. Schistosity
- Trace of gold
- Grams per ton
- 1.0 meters
- Higher gold concentration

Figure 3.—View looking northwest along ridge trail. Site of photograph shown on map ***B***.

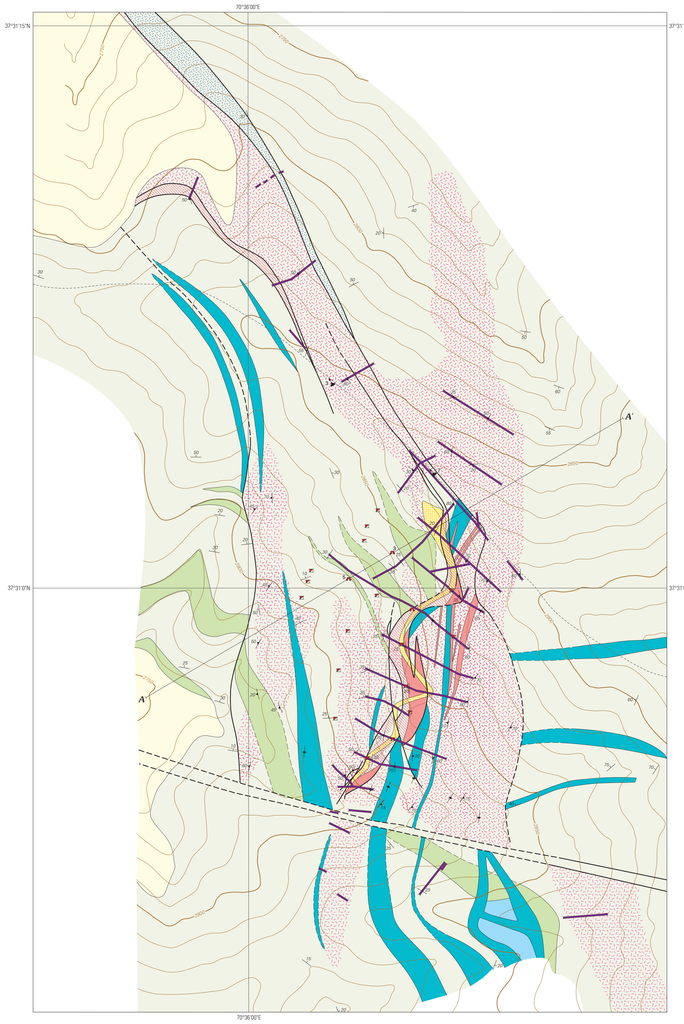
Figure 4.—Crushed, limonitic fault gouge with mineralized gold-bearing quartz vein fragments from the main Weka Dur vein. Field of view is 25 cm.

Figure 5.—Aerial view looking northwest at trenches and adits shown on map ***B***.

Figure 6.—Altered and brecciated mineralized marble from the nearby Weka Dur main vein.

Figure 7.—View looking northwest at trench along ridge trail. Site of photograph shown on map ***B***.

Figure 8.—Wall of adit 5 in the main Weka Dur gold deposit showing alteration, brecciation, oxidation, and veining.



Topography derived from Advanced Spaceborne Thermal Emission and Reflection (ASTER) 30-meter Global Digital Elevation Model (GDEM) data, 2009
Projection and grid: Universal Transverse Mercator (UTM), zone 42 north
World Geodetic System (WGS) 1984 Datum

SCALE 1: 2 000
500 400 300 200 100 0 500 FEET
100 50 0 100 METERS
CONTOUR INTERVAL 10 METERS

Modified from original compilation of Guguev and others (1967); see References Cited

B.—Weka Dur gold deposit trench map. The area is outlined on ***A***.

DESCRIPTION OF MAP UNITS

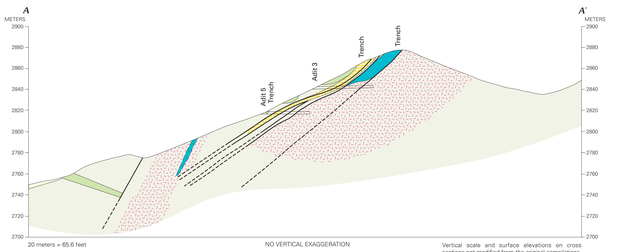
- Recent fluvial deposits
- Marble
- Quartz-mica schist
- Amphibolite
- Diabase, albitized

HYDROTHERMAL ALTERATION

- Orebody
- Limonite
- Limonitized
- Sericitization, chloritization, carbonatization
- Carbonatization

EXPLANATION OF MAP SYMBOLS

- Contact—Dashed where inferred
- Area of high gold concentration
- Fault, fracture—Dashed where inferred
- Strike and dip of bedding
  - Inclined
- Strike and dip of schistosity
  - Inclined
  - Vertical
- Trench
- Exploration shaft
- Adit
- Site of photograph—Tip of arrow at point of observation; number keyed to figure
- Trail



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Geologic Map of the Weka Dur Gold Deposit, Badakhshan Province, Afghanistan, Modified from the 1967 Original Map Compilation of M.P. Guguev and Others

Compiled by
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2014

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