



2012 Minerals Yearbook

AFGHANISTAN

THE MINERAL INDUSTRY OF AFGHANISTAN

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Afghanistan is a land-locked country. Mineral and energy resources represent a potential source of new wealth for Afghanistan. The mineral sector was a significant contributor to its gross domestic product (GDP). The major metal and industrial mineral resources include chromium, copper, gold, iron ore, lead and zinc, lithium, marble, precious and semiprecious stones, sulfur, and talc (Peters and others, 2007). The mineral fuel resources consist of natural gas and petroleum. In 2012, a copper mine was being developed at Aynak, iron ore mines were being developed at Hajigak, and natural gas was produced at Sheberghan. Additional development of mineral resources that were not currently being produced was hindered by issues with improvements in infrastructure and security in the country. Investment in infrastructure and transportation projects for mining was a critical aspect of developing Afghanistan's mineral industry.

Minerals in the National Economy

With international assistance (foreign aid accounted for 90% of the country's revenue), Afghanistan's economy was recovering from a decade of conflict. Foreign aid was expected to begin to decrease in the near future, however, although foreign investment was expected to increase as mineral licensing rounds that had been underway since 2011 were completed. Gradual development of the country's mineral resources was expected to spur future economic growth. In 2012, the mineral sector accounted for 20% of Afghanistan's GDP. The country exported a small amount of precious and semiprecious gemstones and imported most of its energy, including petroleum products and electricity (Webb and Edel, 2012).

Government Policies and Programs

Corporate entities in Afghanistan are generally liable to pay corporate income tax at a flat rate of 20% applied to income as well as a business receipt tax of 2% applied to the corporation's gross revenue. Under the Income Tax Law of 2009, any contractor (a mining company) under an exploration and production-sharing contract will be treated as a qualifying extractive industries taxpayer and thus has the option to stabilize income tax at a rate of 30% for the entire term of the contract (8 years). Also, it is exempt from the business receipt tax, as it has paid royalties, and is eligible for accelerated depreciation and full carry-forward of losses. All exploration and development expenditures are deductible against operating revenues (Devine, 2012).

The Government of Afghanistan sought significant foreign direct investment in the mineral sector and had issued exploration tenders for four mineral prospects—Badakhshan, Zarkashan, Balkhab, and Shaida. The Badakhshan area in the Province of Badakhshan was a known gold-bearing quartz vein system. Based on trench sampling, Russian geologists had estimated reserves for the Veka Dur deposit and other quartz veins in the area to contain a total of 1,200 kilograms (kg) (39,000 troy ounces) of gold at a

grade of 4.8 grams per metric ton (g/t). The Zarkashan project in the Province of Ghazni was a skarn mineralization with a core that has relatively high gold grades and a halo that has low gold grades. The Balkhab copper prospect in the Provinces of Balkh and Sar-e Pul showed evidence of copper mining activity in old surface and underground workings. A reconnaissance sampling was carried out in 2008. The Shaida mineralization in the Adraskan District of Herat Province was a copper porphyry deposit with copper grades of between 0.1% and 0.8%. The rock assemblage showed layered quartz plagioclase porphyry, quartz keratophyre, and aleuropelite interbedded with volcanic layers. Exploration licenses for three of the prospects—Badakhshan, Balkhab, and Shaida—had been awarded to three different companies (Chadwick, 2012).

The Ministry of Mines was running its second hydrocarbon licensing round for six blocks in the Afghan-Tajik Basin. Bidders would compete on the basis of their proposed royalty rate and exploration program. In case of a tie between two bidders, the Hydrocarbons Law, which was promulgated in 2009, provides that the contract would be awarded to the highest bidder with an Afghan partner. There is no distinction between royalty rates for oil and natural gas. The Ministry's profit share ranges between 50% and 70%, and the Ministry does not have a participating interest or any back-in rights (Devine, 2012).

Afghanistan's infrastructure development in 2012 included the opening run of the 75-kilometer railway that links Hairatan (near the border with Uzbekistan) and Mazar-i-Sharif. The line had been nominally operational and test-run since mid-2011 by Uzbekistan's state railway Uzbekistan Temir Yollari (UTY) under a 3-year concession agreement. UTY built the line with contributions from the Asian Development Bank (\$165 million), the Government of Afghanistan (\$20 million), and the local municipalities. The line was built to transport commercial cargoes and mineral ores (Railway Gazette, 2012).

Production

Owing to the lack of reported mineral production data, information about Afghanistan's mining activities was not readily available, but the activities in general appeared to be limited in scope except for planned operations by foreign companies. The country produced cement, coal, natural gas, and some industrial minerals for domestic consumption. The Government provided only partial output data for 2008 through 2010. For 2012, production of chromite was estimated by the U.S. Geological Survey (USGS) to be about 6,000 metric tons (t); marketed natural gas, 145 million cubic meters; and talc, 200,000 t. Production of rock salt and cement was estimated to have decreased by 5.3% and 2.6%, respectively, compared with that of 2011. Output of petroleum condensate, however, was estimated to have increased significantly by 14.3%, as China National Petroleum Corp. (CNPC) began trial oil production in October 2012 (table 1).

Structure of the Mineral Industry

Afghanistan's mineral industry was characterized by small-scale operations; output was supplied mainly to local and regional markets. Privatization of Afghanistan's state-owned companies, which controlled many of the country's mineral resources, was ongoing but not completed. The Government encouraged investment in the mineral sector by private domestic companies and foreign investors. Foreign companies from Canada, China, and India had begun to participate in the country's resource development (table 2).

Commodity Review

Metals

Copper and Gold.—The Aynak copper deposit, which was among the world's large copper deposits, is located southeast of Kabul in the Province of Logar. Metallurgical Group Corp. of China acquired the property in 2007 and continued with development of the \$3 billion Aynak copper mining project, which had been attacked numerous times by insurgents. The development stage employed 500 Afghan citizens and a special security force of 1,500. Construction work had been delayed, and some Chinese workers had left the mine site because of the security situation. The Government planned to improve security and convince the Chinese workers to restart work. The discovery of ancient monastery relics and the clearing of land mines in the area were additional causes for the delay in construction. Copper production was expected to begin in 2016. The mine was projected to be able to generate \$300 million in annual royalties for the Government. Social and environmental concerns linked to the development of the mine included displacement of villagers and disruptions to the water supply (Donati and Harooni, 2012).

Afghan Gold & Minerals Co., which was owned by a consortium led by JPMorgan Chase & Co. of the United States, was working on exploration of a gold deposit in northern Afghanistan and reviewing data from soil samples and drilling. The company planned to invest \$50 million to develop a mine. The Government had also awarded Afghan Gold & Minerals the Balkhab copper exploration license in northwestern Afghanistan. Another company, Afghan Minerals Group, was granted a license to explore the Shaida copper deposit in the Province of Herat. Turkish-Afghan Mining Co. was picked to explore and develop the Badakhshan gold-copper project in the Province of Badakhshan (Khaama Press, 2012).

Iron Ore.—A consortium of seven Indian steel companies led by the Steel Authority of India Ltd. won the rights to develop the Hajigak iron ore deposit in 2011, and development contracts were expected to be finalized by the end of July 2012. When production from the \$11 billion project begins, India could overtake China as the leading overseas investor in Afghanistan. The Hajigak iron ore deposit was considered to be one of the larger iron ore deposits in the world and had reserves of 1,800 million metric tons (Mt) (Webb and Edel, 2012).

Industrial Minerals

In 2011, the USGS (Kokaly and others, 2011) discovered some industrial minerals, such as dolomite, gypsum, and kaolin, in Afghanistan by using advanced remote sensing hyperspectral imaging. High concentrations of dolomite were identified in the central Provinces of Ghazni, Ghor, and Urozgan; gypsum, in the Province of Paewan; and kaolin, in the Province of Daykundi (Germain, 2012).

Rare Earths.—Rare earths had been identified since at least the mid-1970s in the Khanneshin deposit in Helmand Province. The geology of the deposit indicated Type 1 mineralization (semiconcordant bands and veins in alvikite) estimated to be 218 Mt of ore grading 2.77% light rare-earth elements (LREEs), and Type 2 mineralization (discordant dikes and sheets enriched in fluorine or phosphorus) estimated to be 15 Mt of ore grading 3.28% LREEs. The ores included khanneshite, monazite, and synchysite (Nicoletopoulos, 2012).

Talc.—Talc deposits have been identified in many districts in the Province of Nangarhar, and talc mining was being conducted on a small scale. The color of the talc in these deposits was very white, and the talc was in great demand. In the Khogyani District talc deposit (with mines at Kudikel and Markikhel), talc was found in bands within dolomite; in the Shinwari District talc deposit (with mines at Kot and Shinwari), talc was associated with magnesite. Both deposits showed low iron and calcium content, which made them suitable for making polymers and ceramics. The country's talc production was estimated to be about 200,000 metric tons per year (Wilson, 2012).

Mineral Fuels

Petroleum.—Exxon Mobil Corp. of the United States expressed interest in the 2012 licensing round of six blocks in the western portion of the Afghan-Tajik Basin. Seven companies were expected to participate and included Dragon Oil plc of Dubai, Kuwait Energy, ONGC Videsh Ltd. of India, Pakistan Petroleum Ltd., Petra Energia S/A of Brazil, PTT Exploration and Production Public Co. Ltd. (PTTEP) of Thailand, and Turkiye Petrolleri A.O. (TPAO) of Turkey. The deadline for bids was October 2012, and the contracts would be awarded in early 2013. The blocks were estimated to hold several hundred million barrels of oil equivalent. More than 60 geologic structures that may contain hydrocarbons had been discovered in the six blocks by gravity and magnetic surveys. CNPC won the development of three hydrocarbon blocks in the Amu Darya basin in 2011. These blocks held an estimated 82 million barrels of proved and probable oil reserves. CNPC offered to pay a 15% royalty on each barrel of oil produced and 30% corporate tax on its profits, as well as committing to build a \$300 million oil refinery (Petroleum Economist, 2012).

Outlook

The development of Afghanistan's rich mineral resources could provide substantial impetus to economic growth in the country. The Government forecasted that mining would represent 25% of the Afghanistan's GDP in 2016 after copper production comes onstream. Foreign investment in infrastructure

and transportation for mining is expected to be a key factor in the development of its mineral industry. Some gold and copper projects are in the development stages and are expected to start production in 2013 and 2016, respectively. The first gold mine has provided royalties to the Government. Contracts for iron ore and hydrocarbon projects have been awarded. The country is expected to offer more tenders for mineral and energy resource development in the near future.

References Cited

- Chadwick, John, 2012, Exploration continues amid the turmoil: *International Mining*, v. 8, no. 4, April, p. 3.
- Devine, Richard, 2012, Beyond the conflict: *Petroleum Economist*, October 23. (Accessed October 25, 2012, at <http://www.petroleum-economist.com/article/3107094/beyond-the-conflict.html?LS=EMS735554>.)
- Donati, Jessica, and Harooni, Mirwais, 2012, Chinese halt of flagship mine works imperils Afghan future: *Mineweb.com*, September 28. (Accessed October 1, 2012, at <http://www.mineweb.com/mineweb/view/mineweb/en/page/72068?oid=159334&sn=detail>.)
- Germain, Leah, 2012, USGS detects industrial minerals in Afghanistan: *Industrial Minerals*, no. 540, September, p. 16.
- Khaama Press, 2012, Afghan Gold & Minerals Co. wins mining permits: *Khaama Press*, December 11. (Accessed March 4, 2013, at <http://www.khaama.com/afghan-gold-minerals-company-wins-mining-permits-2045/print/>.)
- Kokaly, R.F., King, T.V.V., Hoefen, T.M., Dudek, K.B., and Livo, K.E., 2011, Surface materials map of Afghanistan—Carbonates, phyllosilicates, sulfates, altered minerals, and other materials: U.S. Geological Survey Scientific Investigations Map 3152–A, one sheet, scale 1:1,100,000. Also available at <http://pubs.usgs.gov/sim/3152/A/>.
- Nicoletopoulos, Vasili, 2012, Afghanistan’s mineral plan: *Industrial Minerals*, no. 533, February, p. 41.
- Peters, S.G., Ludington, S.D., Orris, G.J., Sutphin, D.M., Bliss, J.D., and Rytuba, J.J., eds., 2007, Preliminary non-fuel mineral resources assessment of Afghanistan: U.S. Geological Survey Open-File Report 2007–1214, 822 p. (Also available at <http://pubs.usgs.gov/of/2007/1214/>.)
- Petroleum Economist, 2012, ExxonMobil sniffs out Afghan opportunity: *Petroleum Economist*, v. 79, no. 7, September, p. 47.
- Railway Gazette, 2012, Afghan railway starts commercial traffic: *Railway Gazette*, February 3. (Accessed February 10, 2012, at <http://www.railwaygazette.com/nc/news/single-view/view/afghan-railway-starts-commercial-traffic.html>.)
- Webb, Stephen, and Edel, Robert, 2012, Mining in the Asia Pacific—A legal overview (Afghanistan): *Mondaq.com*. July 31. (Accessed August 2, 2012, at <http://www.mondaq.com/article.asp?articleid=188776&print=1>.)
- Wilson, Ian, 2012, The emergence of Afghanistan as a significant talc supplier: *Industrial Minerals*, no. 540, September, p. 60.

TABLE 1
AFGHANISTAN: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ³	2008	2009	2010	2011	2012
Cement, hydraulic	37,300 ⁴	31,500 ⁴	35,600 ⁴	38,000	37,000
Chromite	6,500 ^r	6,700 ^r	5,727 ^{r,4}	6,204 ^{r,4}	6,000
Coal, bituminous	346,900 ⁴	500,100 ⁴	724,900 ⁴	750,000	780,000
Gas, natural:					
Gross	155 ⁴	142 ⁴	142 ⁴	145	150
Marketed	145	140	140	142	145
Gold	--	--	NA	NA	NA
Gypsum	48,700 ⁴	46,400 ⁴	63,100 ⁴	62,000	65,000
Marble	36,900 ⁴	26,600 ⁴	28,900 ⁴	30,000	32,000
Nitrogen, N content of ammonia	18 ⁴	22 ⁴	27 ⁴	28	30
Petroleum, condensate	156 ⁴	104 ⁴	64 ⁴	70	80
Salt, rock	158,200 ⁴	180,300 ⁴	186,100 ⁴	190,000	180,000
Talc	200,000	200,000	200,000	200,000	200,000

^rRevised. do. Ditto. NA Not available. -- Zero.

¹Estimated data are rounded to no more than three significant digits.

²Table includes data available through June 12, 2013.

³Barite, natural gas liquids, precious and semiprecious stones, and lapis-lazuli were being produced, but sufficient data were not available to make reliable estimates of output.

⁴Reported figure.

TABLE 2
AFGHANISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Aluminum:				
Extrusion and powder coating		Qader Najib Ltd.	Kabul	NA
Manufacture		Salam Bilal Ltd.	Kandahar	360
Cement	metric tons per day	Afghan Cement LLC (subsidiary of Government-owned Afghan Investment Co.)	Ghori I, Pol-e-Khomri, Baghlan	400
Do.	do.	do.	Ghori II, Pol-e-Khomri, Baghlan	500
Do.	do.	do.	Ghori III, Pol-e-Khomri, Baghlan ¹	4,000
Coal		Afghan Coal LLC (subsidiary of Government-owned Afghan Investment Co.)	Ahandara, Dudkash, Karkar, and Khurdara near Pol-e-Khomri	NA
Copper, in concentrate		Aynak Minerals Co. Ltd. (China Metallurgical Group Corp., 75%, and Jiangxi Copper Co. Ltd., 25%)	Aynak, Logar ²	180,000
Fertilizer, urea		Kud Bergh Fertilizer Ltd.	Qala Jangi near Mazar-i-Sharif	105,000
Gas, natural	cubic meters per day	Afghan Gas Ltd. (Government owned)	Jawzjan	70,000
Do.	do.	do.	Sheberghan	140,000
Gold	kilograms	Westland General Trading LLC	Nor Aaba, Takhar	NA
Lapis-lazuli	do.	Government owned	Sary-Sang, Badakhshan	9,000
Steel, manufacture		Khalil Najeeb Steel Mills Ltd.	Jalalabad, Kabul, and Mazar-i-Sharif	36,000
Talc		Amin Karimzai Ltd.	Khogyani and Shinwari Districts, Nangrahar	200,000

^eEstimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

¹The Ghori III plant is expected to operate in 2013.

²The Aynak Mine is expected to start production in 2016.