### THE MINERAL INDUSTRY OF

# UZBEKISTAN

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Uzbekistan was the third most populous state created from the former Soviet Union (FSU) and the fourth largest in land area. Well endowed with mineral wealth, it was among the world's largest producers of gold, which was a significant source of foreign currency earnings. Along with gold, Uzbekistan produces a number of other nonferrous metals important to its economy including copper, lead, molybdenum, silver, tungsten, and zinc as well as natural gas, and uranium. Uzbekistan also produced steel, coal, gas, and oil, and had one of the FSU's largest gas-processing facilities at Mubarek. Uzbekistan also produced significant quantities of industrial minerals, including feldspar and fluorspar, as well as a range of minerals for the construction industry.

In 1996 Uzbekistan recorded a 1.6% increase in gross domestic product (GDP) and a 5.9% increase in industrial output compared with that of 1995. Although 1996 was the first year since the breakup of the Soviet Union that Uzbekistan has registered a positive growth rate for GDP, the rate of growth of industrial output has been positive each year since 1993. Furthermore, the decline in GDP in Uzbekistan since the breakup of the Soviet Union has only been 17%, which is a far smaller decline than in any other states of the Commonwealth of Independent states (CIS). The other CIS states registered rates of decline in their GDP ranging from a high of 75% to a low of 35% during this period (Interfax Statistical Report, 1997).

Uzbekistan's State Committee for Geology in June issued a tender for bids for rights to develop a total of seven gold and other metal deposits in the west of the country. In December it extended the time for bidding until March 1, 1997, because a number of major western companies did not get their applications in on time. As of December, the Committee said it had received 17 bids from large firms. Bids had been received from firms from Australia, Canada, Germany, Japan, and South Africa, but none from U.S. companies (Interfax Mining News, 1996).

In November, Uzbekistan offered three nonferrous metals deposits for investment. The first, the Khandiza reportedly contains an estimated 700,000 metric tons (t) of lead, 1.54 million metric tons (Mt) of zinc as well as copper, silver, and associated metals. The second, the Aktepe, requires additional exploration, but is thought to contain up to 20,000 t of silver as well as cobalt, bismuth, and nickel. The third is the Shavazai rare-metals deposit containing lithium, cesium, and rubidium with the ore having a lithium oxide content of 0.5%, a cesium content of 0.014%, and a rubidium content of 0.037% (Interfax Daily Business Report, 1996).

The Navoi Mining and Metallurgical Complex (NGMK) in

Uzbekistan is one of the FSU's biggest gold and uranium producers. In July, NGMK, with gold output of over 55 metric tons per year (t/yr), announced plans for a major investment program intended to increase gold output by 10% per year. The investment will be used to deepen the Muruntau open pit, install new conveyors, and increase milling capacity to 26 Mt/yr of ore. Work is scheduled to commence in 1997 (Mining Journal, 1996a).

Uzbekistan was the first country in the FSU to have a major gold mining joint venture (JV), the Zarafshan-Newmont JV, formed to treat low grade ores from the Muruntau open pit stored in dumps at NGMK using heap-leaching technology. In 1995, the Zarafshan-Newmont JV began operation and will play a major role in increasing output at NGMK. NGMK also has one of the country's two gold refineries with the Navoi refinery being accredited by the London Association for 99.9999% (four nines) gold. The country's other refinery at Almalyk is seeking accreditation from the London Association for its four nines gold. Almalyk's refinery, however, has only been in operation for 4 years and the London Association requires 5 years of operation before acquiring accreditation (Interfax Mining and Metals Report, 1996c).

The Angren Gold Company, a joint venture between Uzbekistan, the Newmont Corp. of the United States and Mitsui Ltd. of Japan, reportedly will invest an initial \$188 million into the development of the Kyzylalmasai and Kochbulak gold fields, according to the head of the country's State Committee for Geology. These companies in May 1996 won a tender to develop these two gold fields in the Tashkent region, which the Uzbek State Committee for Geology reportedly estimates contain together 270 t of gold, with average ore grades of 6 to 8 grams per ton (g/t). An agreement to form a joint venture to develop these deposits was signed on October 2. Newmont and Mitsui own respective shares of 40% and 20% and the Uzbek State Committee for Geology and Uzalmazzoloto, a major Uzbek gold mining association, own a combined 40% share. Reportedly, this was the first time the Uzbek Government had agreed to a smaller share than western partners in a gold mining project (Interfax Mining and Metals Report, 1996b).

The joint-venture agreement includes not only developing the new deposits, but also operating an existing underground gold mine and processing plant. The terms call for expanding output at the existing mine, carrying out further delineation work on known deposits in the region, and conducting additional exploration in the region (Mining Journal, 1996b).

The Angren Gold Company initially will conduct a feasibility study for the Kyzylalmasai and Kochbulak project. Project

development reportedly involves constructing mining capacity for extracting 1.2 to 1.5 Mt/yr of ore, building a new mill, and upgrading the existing mill. Construction is slated to begin in the middle of 1998 and take from 18 months to 2 years. Uzalmazzoloto, by its participation, will make its gold mill in Angren available to the joint venture. The joint venture will initially have a life of 25 years, which will be extended as long as the fields are commercially minable. The venture, by initial estimates, could produce 12 to 15 t/yr of gold (Interfax Mining and Metals Report, 1996b).

The United Kingdom's Lonrho PLC is involved in a project to develop the Amantaytau and Daugistau gold lode deposits in Uzbekistan. Amantaytau and Daugistau will be developed by a JV called Amantaytau Goldfields, in which Lonrho owns a 35% share; the International Finance Corporation (IFC) owns an 8% share, and the remaining 57% interest is split equally between the Uzbek State Committee for Geology and NGMK. The Amantaytau Goldfields project involves designing, building, and operating four open pits, one underground mine, and a mill. Amantaytau and Daugistau reportedly contain about 280 t of gold (Interfax Mining and Metals Report, 1996a).

The joint venture will have a designed capacity to process about 3.5 Mt/yr of ore mined from Amantaytau and Daugistau. The first stage of the mill will process oxide ores. It is believed the venture at the second stage will use biological leaching technology developed by Biomin, a Canadian company (Interfax Mining News, 1997a).

NGMK, which is also the country's major uranium producer, in 1996 reportedly produced 1,700 t of uranium, which was 300 t less than in 1995. The 1997 target was 2,400 t, and the 1998 target 3,000 t. Uzbekistan does not have its own nuclear industry and exports all of its uranium. After the breakup of the Soviet Union, Uzbekistan began to ship its uranium outside the FSU. Since 1992, all Uzbek uranium has been exported via the Nukem Corp. of the United States (Summary of World Broadcasts, 1997). At the end of 1996, the U.S. Department of Commerce increased Uzbekistan's export quota to the United States in view of higher world demand for uranium (Interfax Mining News, 1997).

Most of Uzbekistan's uranium reserves are concentrated in 27 deposits in the Central Qizelqum Desert with combined reported resources of about 55,000 t of metal. The country also reportedly possesses considerable undiscovered uranium resources, but currently does not have funding to finance geologic work. According to the International Atomic Energy Agency (IAEA), Uzbekistan currently possesses the world's seventh largest uranium reserves. Uzbekistan also ranks among the world's largest uranium producers and sellers. NGMK has begun renovating its uranium production capacity under a long-term program until the year 2030. The program mainly involves renewing drilling capacity. Navoi mines uranium by the in situ leach method, and therefore extractive operations consist mainly of drilling and operating boreholes (Interfax Mining News, 1997c).

In situ leaching enables Uzbekistan to process low grade ores. It is also possible to extract byproduct elements from the uranium ore including rhenium, scandium, yttrium, lanthanum, samarium, vanadium, molybdenum, selenium, and others. Based on a market analysis, NGMK reportedly believes it can increase its volume of uranium mining by 80% in 1998 as compared with 1995 (Nezavisimaya Gazeta, 1997).

In 1997, the Government of Uzbekistan plans to incorporate the Uzbek Refractory and High-temperature Metals Plant in Cjirchiq (formerly Chirchik), a tungsten and molybdenum mining and fabrication enterprises. It would be the first Uzbek mining company to be incorporated. The Uzbek Refractory and High-temperature Metals Plant, commissioned in 1956, operates the Ingichka and the Koytash tungsten mines respectively in Samarkand and Jizzakh regions, with respective designed capacities of 500,000 t/yr and 165,000 t/yr. However the tungsten content of ores at these mines has fallen respectively to 0.6% and 0.4% (Interfax Mining News, 1997d).

The Uzbek Refractory and High-temperature Metals Plant, according to its management, had been running at just 30% to 35% of capacity during 1996. The enterprise produces semifabricated tungsten and molybdenum products and powder, a number of hard alloys, and tungsten wire. In Soviet times one-half the plant's capacity was filled by orders from the defense industry and the plant ran into financial difficulty following the breakup of the Soviet Union (Interfax Mining News, 1997d).

The Metals Plant is gradually phasing out its own mining operations and using more raw materials from elsewhere. Koytash and Ingichka used to supply 40% of the refractory metal plant's tungsten feed stock. The rest was fed by raw materials from Russia, mainly from the Primorsky Mining and Milling Complex and the Lermontov Mining Company, both from the Primorye territory in the Russian Far East (Interfax Mining News, 1997d).

Uzbekistan possesses a number of undeveloped tungsten ore deposits, including the Sautbai and Sarytau deposits. The Uzbek State Committee for Geology and Mindeco, a subsidiary of Mitsui of Japan, are carrying out detailed exploration of these two deposits (Interfax Mining News, 1997d).

Molybdenum is not an important byproduct of the Metals Plant's tungsten mines. The Metals Plant receives most of its domestic molybdenum supplies from the Almalyk Integrated Mining and Metallurgical Plant in the Tashkent region, where molybdenum is a byproduct of copper mining. However Uzbekistan itself is able to supply only 30% of the plant's molybdenum raw material requirements. The rest comes from Russia, mainly from mines in the Orenburg region in the Urals (Interfax Mining News, 1997d).

Fertilizer in Uzbekistan is produced by the Uzbek fertilizer association Uzkhimprom. It consists of three phosphate fertilizer plants: the Kokand superphosphate plant, the Samarkand chemicals plant, and the Ammofos production association. Uzbekistan, however, has practically no raw materials of its own for phosphate fertilizer production and has to import them from Kazakstan. However, Uzkhimprom says imports of phosphate concentrate have dropped from over 3.5 Mt/yr to 1 mt/yr. (Interfax Mining News, 1997b).

Plans called for developing the Kyzyl Kum phosphate quarry that reportedly is designed to make Uzbekistan self-sufficient in phosphate raw materials. The quarry would work the Tashkura field which is part of the Dzheroi-Syrdarya group of phosphate rock deposits. The Uzbek State Committee for Geology and Mineral Resources stated that reserves in this region total 303.6 Mt of phosphate rock with a total  $P_2O_5$  content of about 57.7 Mt. Tashkura contains an estimated 129 Mt of phosphate rock with 23.4 Mt of PO. NGMK was put in charge of the construction of the Kyzyl Kum phosphate complex. Work was underway to construct a quarry and a mill to produce phosphate concentrate which will be turned into superphosphate, mainly by the Kokand plant. The chief engineer at NGMK stated that at Kyzyl Kum the facilities for the phosphate complex would be supplied by Svedala of Sweden, the winner of a tender for a turnkey contract. NGMK intends by September 1997 to commission the first stage of the phosphate rock quarry. The quarry will have the capacity to produce 300,000 t/yr of phosphate rock for fertilizer production (Interfax Mining News, 1997b).

The second stage of the Navoi plant's phosphate project consists of constructing another complex at the Tashkura site to produce phosphate concentrate to make ammophos. The mill would produce up to 2.774 Mt/yr of concentrate annually from 5.15 Mt/a of crude phosphate rock (Interfax Mining News, 1997b).

Major reconstruction began at the Fergana Oil Refinery of the state production association (GPO) Uzneftepererabotka [Uzbek Oil Refining]. This refinery produces 45 types of petroleum products that it supplies to the countries of Central Asia. The Japanese firm Mitsui and Company, Ltd. is the main contractor for the reconstruction. More than 40% of the output from Fergana is diesel fuel. Mitsui plans to introduce a diesel fuel hydro-desulfuring facility at Fergana that it is claimed will make diesel fuel from Fergana competitive on all world markets (Pravda Vostotka, 1996).

Other major projects in Uzbekistan in the energy sector included the development of the Kokdumalakskiy Oil Field and construction of the Bukhara Oil Refinery. The Fergana oil refinery will process oil from the Kokdumalakskiy field. Oil from the new Kokdumalakskiy Field, reportedly, has a high sulfur content (Pravda Vostoka, 1996).

In 1996, Uzbekistan was self sufficient in energy fuels, with oil production remaining at 7.6 Mt, natural gas production increasing by less than 1% compared with 1995 to 49 billion cubic meters, and coal production falling by 1% to 2.8 Mt (Interfax Statistical Report, 1997). Further work was under way to strengthen self-sufficiency in fuel and to enhance the country's export potential. In December, facilities with a total extraction capacity of 5 billion cubic meters of gas and 200,000 t/yr of condensate were put into operation at the Alan deposit in Kashkadarya region, which makes it possible to meet the country's growing demand for hydrocarbon raw materials. Also in December, a sulphur purification unit, with the capacity to process 2 billion cubic meters of gas per year, was commissioned at the Mubarek gas refinery. Mubarek's gas refining capacity was raised to 30.2 billion cubic meters per year.

Uzbekistan supplies natural gas to Kyrgyzstan, Tajikistan, and Ukraine. In December, it was announced that Uzbekistan under a new intergovernmental agreement will supply gas to southern Kazakstan, boosting exports to Kazakstan to the level of 1995, when it shipped gas worth around \$150 million (Interfax, 1996).

Given Uzbekistan's large gold production as well as its selfsufficiency in mineral fuels, the mineral sector is and will remain one of the chief contributors to the country's economic development. The country has been successful in attracting foreign investment to its gold mining sector. Its other mineral sectors, however, are also in need of investment. Their future will depend on assessing whether these other mineral industries can produce profitably for domestic and/or foreign markets and the degree to which Uzbekistan can finance their development either through domestic or foreign investment. Having been the first country to have attracted large scale foreign investment into its mineral sector for gold production, Uzbekistan enjoys a reputation of having provided a business climate amenable to such large-scale investment. This could give Uzbekistan an advantage in attracting investment if its other mineral industries are assessed as potentially profitable.

#### **References Cited**

- Interfax, 1996, (untitled), Interfax. (Available from foreign Broadcast Information Service on the World Wide Web at URL http://fbis.fedworld.gov) [Originally broadcast from Moscow in English November 8, 1996, GMT 1705.)
- Interfax Daily Business Report, 1996, Uzbekistan offers three nonferrous metals deposits to investors: Interfax Daily Business Report, November 22, p. 5. (Available from Interfax America, Denver, CO)
- Interfax Mining News, 1996, Uzbekistan extends bidding to develop seven metal-rich areas:Interfax Mining News, December 18, 1996. (Accessed on the World Wide Web at http://www.info-mine.com/interfax/news/ifdec18-96.html)
- Interfax Mining News, 1997a, IFC sees no obstacle to Amantaytau goldfields financing: Interfax Mining News, March 14, 1997. (Accessed on the World Wide Web at URL http://www.info-mine.com/interfax/news/ifmar14-97.html)
- ——1997b, Navoi plant to commission first stage of phosphate quarry: Interfax Mining News, April 25, 1997. (Accessed on the World Wide Web at URL http://www.info-mine.com/interfax/news/ifapr25-97.html)
- ——1997d, Uzbekistan to corporatize tungsten and molybdenum plants: Interfax Mining News, January 24, 1997. (Accessed on the World Wide Web at URL http://www.info-mine.com/interfax/news/ifjan244-97.html)
- Interfax Mining and Metals Report, 1996a, London issues quality certificate for Almalyk silver: Interfax Mining and Metals Report, v. V, issue 45,
- November 1-8, p. 4-5. (Available from Interfax America, Denver, CO) ——1996b, Joint venture to raise \$188 mln for Uzbekistan gold projects: v. V, Issue 51-52, December 13-20, p. 5-6.
- Interfax Statistical Report, 1997, Commonwealth of Independent States, preliminary 1996 results: Interfax Statistical Report, v. VI, issue 8, February 14-21, p. 12-14. (Available from Interfax America, Denver, CO)
- Mining Journal, 1996a, (untitled), [London], August 2, p. 83.
- 1996b, (untitled), [London], October 11, p. 285.
- Nezavizimaya Gazeta, 1997, (untitled), [Moscow], February 4, p. 4.
- Pravda Vostoka, 1996, (untitled), [Tashkent], June 18, p. 1.
- Summary of World Broadcasts, 1997, Uranium producer forecasts production boost this year: edition SUW/0480, (undated), p. WE/1. (Originally broadcast by Interfax News Agency in English, Moscow, April 2, 1997, GMT 0901 gmt.) [Available from the British Broadcasting Corp., Reading, England.]

#### **Major Sources of Information**

State Committee on Geology and Mineral Resources (Goskomgeologiya) 11 Shevchenko Street Tashkent, Uzbekistan Telephone: [7] (3712) 33-72-06 American-Uzbekistan Chamber of Commerce (AUCC) 1800 Massachusetts Avenue Suite 600 Washington, DC 20036 Telephone: 202-828-4317 Fax: 202-659-7010 Central Asian-American Enterprise Fund 1634 Eye Street, NW, Suite 200 Washington, DC 20006

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## TABLE 1 UZBEKISTAN: STRUCTURE OF THE MINERAL INDUSTRY FOR 1996

#### (Metric tons unless otherwise specified)

			Annual
Commodity	Major depositsd/ facilities	Location	capacity e/
Bismuth	Ustarasayskoye deposit	Chatkalo-Kuraminskiy region	20.
Coal	Central Asian Coal Association (mining)		
	Angren brown coal deposit	Angren region	6,000,000.
	Baysunskoye deposit	Surkhondaryo region	1,000,000.
Copper:			
Mine output, Cu content	Almalyk mining-metallurgical	Toshkent Wiloyati (Tashkent oblast)	100,000.
	complex minng Kalmakyrskoye,		
	Sarychekinskoye deposits		
Metal	Almalyk refinery	Olmaliq (Almalyk) 1/	130,000.
Feldspar	Karichasayskoye and other deposits	Deposits in Samarqand (Samarkand) and	120,000.
		Toshkent (Tashkent) regions and Karakal-	
	Acote Children tinderen Neuroichen deren	pakstan (Karakalpakskaya ASSR)	150.000
Fluorspar	Agata-Chibargatinskoye, Naugiskenskoye deposits	East of Toshkent (Tashkent)	150,000.
Gold	Muruntau deposit	Nawoiy (Navoi) region	85.
Kaolin	Angren deposit	Angren region	8,000,000.
Lead-zinc:			
Mine output, metal content	Almalyk mining and metallurgical complex	Toshkent Wiloyati (Tashekent oblast)	40,000 (lead).
	miining Uchkulachskoye deposit		80,000 (zinc).
Zinc, metal	Almalyk refinery	Olmaliq (Almalyk)	120,000.
Molybdenum:	Almalyk mining and metallurgical complex	Toshkent Wiloyati (Tashkent oblast)	900.
Mine output, Mo content	mining Kalmakyrskoye,		
	Sarychekinskoye deposits		
Metal	Uzbek refractory and hard metals plant	Chirchiq (Chirchik)	NA
Natural gas liquids	Mubarek gas processing plant	Mubarek	1,200,000.
Petroleum and natural gas	More than 40 oil and gas deposits and	Oil and gas deposits are concentrated in	50 billion
	more than 15 gas deposits under	the Bukhara-Khiva and Sukhondaryo	cubic meters
	exploitation	regions and the Fergana valley	(natural gas)
 	Major, gas deposits:	do	_ total.
<b>D</b> 0.	Dzharkakskove Gazlinskove	40.	
	Mubarekskove, and Shurtanskove		
Do	Maior Oil deposits:	do	5,000,000
201	Khaudagskove, Uchkyzylskove,		(petroleum).
	plautomslpue. Palvantashskove		(F).
	Yashi, Alamyshikskove, Sharikhan-		
	Khodzhiabadskoye deposit		
Steel, crude	Bekabad steel mill	Bekabad	1,100,000.
Tin	Karnabskoye, Lapasskoye deposits	Karnab region	NA.
Tungsten, mine output, W content	Koytashskoye, Ingichkinskoye	Ingichka, Koytash, Lyangar regions	1,200.
	Lyangarskoye, Karatyubinskoye		
	Yakhtonskoye deposits		
Metal	Uzbek refractory and hard metals plant	Chirchiq (Chirchik)	NA.
Sulfur	Mubarek gas processing plant complex	Mubarek	2,000,000.
Uranium	Navoi mining and metallurgical complex	Nawoiy (Navoi) region	NA.

e/ Estimated. NA Not available.

1/ New names and spellings for locations will be used whenever available; old names will appear in parentheses.