



2009 Minerals Yearbook

KYRGYZSTAN [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF KYRGYZSTAN

By Richard M. Levine

During the Soviet period, Kyrgyzstan's mineral industry was based on the extraction of antimony, mercury, rare-earth elements, and uranium. The country was the main producer of mined mercury and of mercury and antimony metal during the Soviet period. By 2009, production of antimony and mercury was being conducted at a much lower level and the production of uranium and rare earths had ceased. The Kara-Balta mining and metallurgical complex near Bishkek, which used to process uranium until the collapse of the Soviet Union, had switched to processing as much as 25 metric tons per year (t/yr) of gold and silver. As of 2009, however, Kara-Balta was again processing uranium at the refurbished Kara-Balta mill.

Kyrgyzstan does not possess large oil and gas reserves, but did produce some oil and gas. Coal mining had been conducted there since the early 1900s when Kyrgyzstan was the main supplier of coal in the Central Asia region, but coal production was no longer substantial and provided less than 25% of the country's coal consumption. Following the dissolution of the Soviet Union, the country's leading mineral sector became the gold mining sector with the development of the Kumtor gold deposit by Canada's Cameco Corp., which concluded an agreement for the development of Kumtor with the Kyrgyz Government in 1994. In 2004, all Cameco's assets were transferred to Centerra Gold Inc. of Canada.

Production

In 2009, the Kyrgyzstan gross domestic product (GDP) increased by 2.3%, but industrial production decreased by 6.4% compared with that of 2008 (Interfax Russia & CIS Statistics Weekly, 2010). In terms of value, gold was the leading mineral commodity produced in Kyrgyzstan. The output of gold in 2009 decreased by about 1 metric ton (t) at the Kumtor deposit and by less than 0.2 t at the Makmal deposit. Production of antimony metal increased. In 2009, production of uranium concentrate increased by 130% to 2,574 t compared with 1,096.5 t in 2008 (M-G-N Capital, 2010b, p. 4). Data on mineral production are in table 1.

Structure of the Mineral Industry

Centerra Gold owned 100% of the Kumtor gold mine through its wholly owned subsidiary Kumtor Gold Co. Besides Centerra Gold, the country's main mining enterprises were the Kadamzhay antimony mining and metallurgical complex, the Makmal gold mining complex, and the Khaydarkan mercury mining and metallurgical complex. The Makmal gold mining enterprise was managed by the Kyrgyzaltyn Joint Stock Co., which was wholly owned by the Government.

Commodity Review

Metals

Antimony and Fluorspar.—The Ministry of Natural Resources reported that in 2009 the antimony plant of the Kadamzhay complex produced 918 t of antimony and antimony compounds, which was 2.8 times more than in 2008. Plans for 2010 called for Kyrgyzstan to produce 1,740 t of antimony and antimony compounds (M-G-N Capital, 2010a, p. 4).

In 1990, Kyrgyzstan had been the third ranked producer of antimony in the world after China and Bolivia, but by 2009, its deposits were significantly depleted. The Kadamzhay antimony mining and metallurgical complex was a vertically integrated antimony production complex that mined the Kadamzhay and the Terek deposits. The complex, where metallic antimony and compounds were produced, contained two mines (the Kadamzhay and the Terek-Sayskiy), beneficiation plants, and the Kadamzhay metallurgical plant. Antimony produced at Khaydarkan as a result of processing antimony-fluorspar concentrate was sent to the Kadamzhay metallurgical facility for processing, and the fluorspar concentrate was sold to consumers.

With the development of large antimony reserves in Russia and Tadzhikistan, ore production at Kadamzhay decreased. The Kadamzhay complex did not operate in 2004 and 2005, and in 2005, it was privatized. The new owners engaged in investing in technically reequipping the plant and in infrastructure development for the mines. From mid-2005 until November 2006, Kadamzhay ceased producing antimony and other products because it had not been able to obtain raw material supplies from the Anzob mining and beneficiation plant in Tajikistan, which had been its main raw material supplier.

To resolve its raw material supply problem, in 2006, the Kadamzhay metallurgical plant oriented its production to processing concentrate from Russia. In the fall of 2006, Kadamzhay began receiving its supplies of raw materials from the Chita region in Russia, which enabled the plant to resume stable operations. Plans called for the Kadamzhay plant to produce between 3,000 and 5,000 t/yr of antimony metal and its compounds. Despite more than 70 years of development, Kadamzhay still had a large quantity of remaining reserves. These reserves, however, had not yet been reevaluated on the basis of market economy criteria rather than the criteria that had been used in Soviet times. The remaining reserves at the Khaydarkan deposit were reportedly 107,700 t of antimony and 1.071 million metric tons (Mt) of fluorspar reserves (Zubkov, 2007; United Nations Environmental Programme, 2009).

Gold.—Kyrgyzstan had two gold mining enterprises—Kumtor Gold and Kyrgyzaltyn. Kumtor was located about 350 kilometers (km) southeast of the capital Bishkek and about 60 km north of the border with China. The Kumtor gold deposit is located in the southern Tien Shan metallogenic belt, which is a major suture that traverses Central Asia, from Uzbekistan in

the west through Tajikistan and Kyrgyzstan into northwestern China, which is a distance of more than 1,500 km. A number of mesothermal-type gold deposits occur along this belt. Kumtor is the largest gold mine in Central Asia to be operated by a Western-based company.

From 1997 to 2007, Kumtor produced a total of more than 6 million troy ounces (about 187 t) of gold. In 2008, gold production at Kumtor decreased to 556,000 troy ounces (about 17.3 t). In 2009, production at Kumtor again decreased to 525,000 troy ounces (about 16.3 t) of gold. In the fourth quarter of 2009, however, Kumtor set a quarterly production record, producing more than 247,000 troy ounces (about 7.7 t) of gold (Centerra Gold Inc., 2010).

The Ministry of Natural Resources reported that Kyrgyzaltyn's gold production decreased to 647 kilograms (kg) in 2009 compared with that of 2008, or by 22.1%. Kyrgyzaltyn projected that it would produce 882.3 kg of gold in 2010 (M-G-N Capital, 2010c. p. 4).

Mercury.—The Khaydarkan mercury mining and metallurgical complex mined the Khaydarkan and the Novoye deposits. The remaining reserves at the Khaydarkan deposit were reportedly 11,000 t of mercury, and at the Novoye deposit, 5,500 t. These deposits were also reported to contain 107,700 t of antimony and 1.071 million metric tons (Mt) of fluor spar reserves. The Khaydarkan complex contained two underground mines, a beneficiation plant, and metallurgical processing facilities. Previous to 2005, Khaydarkan had been producing about 500 to 600 t/yr of mercury, but this amount decreased to 304 t in 2005 (United Nations Environmental Programme, 2009).

The majority of the remaining reserves at Khaydarkan were of complex ores from which it was more difficult to extract mercury. Significant mercury reserves remain at deeper depths at Khaydarkan, but investment has not been forthcoming to allow for their exploitation (United Nations Environmental Programme, 2009).

Besides Khaydarkan, there had historically been two other mercury mining sites in the region (Chonkoy and Chauvay), which produced 9,000 t of mercury before they were closed in the early 1990s. Khaydarkan remained the only mercury mining enterprise in the world that continued to sell its output abroad, and it remained the only operation that supplied primary mined mercury to the global marketplace. Since it began operations, the Khaydarkan complex was estimated to have produced a total of more than 36,000 t of mercury. The mercury mine and smelter date from 1941 when mine equipment and infrastructure were relocated at Khaydarkan following the evacuation of industrial facilities from Ukraine to Khaydarkan during World War II. The Khaydarkan site is considered remote as it is located in the mountains of southwestern Kyrgyzstan and reached by a narrow road over a 2,300-meter pass. Mercury production in 1941 was less than 100 t and peaked in the late 1980s at almost 800 t. In 2008 (the latest year for which data were available), Kyrgyzstan produced less than 300 t (United Nations Environmental Programme, 2009).

The main reason that Khaydarkan was the only enterprise still mining mercury for the global market was because of the economic difficulties Kyrgyzstan faced, particularly in the region where the mine is located, which made the country

reluctant to close the mine without alternative employment for the population. The company that managed the complex had been struggling with fluctuating mercury prices and continuous technical difficulties, such as low ore grades and flooding of shafts with underground water. A number of times, Khaydarkan, which was state-owned, had to request subsidies and state support to continue its operations; initial efforts to privatize the mine were not successful (United Nations Environmental Programme, 2009).

Although the Khaydarkan complex was important to the local community as a source of income, it was recognized that mercury mining poses environmental risks. Mercury contamination from Khaydarkan had been a problem for about 70 years. High mercury concentrations are found in slag, sludge, and tailings from the mine. These significantly affected the town, surrounding farmland, and waterways, all of which showed elevated mercury concentrations that often exceeded Kyrgyzstan's national standards. Environmental protections were constrained, and monitoring and reporting were limited.

Owing to waste deposits and contaminated agricultural soils, pollution would continue even if production stopped. Limited studies have suggested that human health may have been affected, as some workers had experienced health problems and some children had suffered neurological damage. Concerns had been raised about mercury dispersal from Khaydarkan as rivers flow from Kyrgyzstan to its neighbors Tajikistan and Uzbekistan and into Kyrgyzstan's fertile Fergana Valley. Most of the mercury and other pollutants that had entered the environment from the Khaydarkan complex consisted of gaseous emissions from the mercury smelter or from waste streams generated during mining and processing of ore. More than 13 Mt of slag, 4 Mt of tailings, and several million tons of waste rock were deposited in close proximity to the town and were posing significant risks of instability and pollution. There was also a sludge pond that contained several thousand metric tons of highly concentrated mercury wastes that originated from the mercury purification process. Water was draining from all these waste sites, and the water was used for irrigation or was drunk by cattle in the area (United Nations Environmental Programme, 2009).

In 2009, the United Nations Environment Programme (UNEP) Governing Council prepared a legally binding instrument on mercury to reduce the global supply of and demand for mercury to protect human health and the environment, but the instrument would also take into account the circumstances of individual countries. Kyrgyzstan, which was the only country with a mine that was still supplying mercury abroad, faced upcoming negotiation on the global legally binding instrument (United Nations Environmental Programme, 2009). On October 20, 2009, the State Secretary for Industry of the Government of Kyrgyzstan announced the conditional closure of Khaydarkan during a meeting in Bangkok, Thailand. The meeting was led and organized by the UNEP and was the culmination of 2 years of work with the United Nations Institute for Training and Research (UNITAR), in partnership with UNEP and the Governments of the United States and Switzerland. The decision was in line with a UNEP project, entitled "Development of an Action Plan to Address Primary Mercury

Mining in Kyrgyzstan,” which consisted of intensive activities to assist all ministries, agencies, and stakeholders outside of the Kyrgyzstan Government in reaching a decision on closure (United Nations Institute for Training and Research, 2009).

Rare Earths.—Open pit mining of rare earths had taken place in Kyrgyzstan from 1960 through 1991 at the Kutessai II deposit, and the majority of rare-earth reserves still remained. Of the remaining rare-earth reserves, 54.5% was light rare earths of the cerium group and 43.7% was heavy rare earths of the yttrium group. The complex had produced up to 120 types of rare-earth products, which included oxides of yttrium, oxides of lanthanum and neodymium, dioxides of cerium, and rare-earth alloys. During the beneficiation process, lead and molybdenum concentrates were also produced and sold. In 1995, the chemical-metallurgical plant was privatized and transformed to produce high-purity silicon (Zubkov, 2007).

In December 2009, Stans Energy Corp. of Canada purchased the Kutessai II deposit from the Kyrgyzstan Government. Stans proposed to conduct a feasibility study on restarting production at Kutessai II and to have a resource estimate based on the Australasian Joint Ore Reserves Committee (JORC) resource criteria prepared in conjunction with the feasibility study. Stans envisioned that the Kutessai II deposit could be the first major heavy rare-earth producing deposit outside of China.

The Kutessai II deposit had been a major supplier of rare earth for the Soviet Union. Between 1958 and 1991, ore was mined at the Kutessai II deposit from an open pit from which 22,109 t of rare-earth metals (REM) was produced from 5,454,400 t of ore at an apparent grade for REM of 0.41% in the ore and a recovery rate of 64.5%. During the Soviet era, the Kutessai II deposit was producing at a rate of 300,000 t/yr of ore, which was equivalent to 750 t/yr of REM after recovery losses. Stans intended to increase production to 2,000 t/yr, which would require extensive upgrading of the Soviet era processing facilities still at the site and the installation of new state-of-the-art equipment.

In 1996, the Kyrgyzstan State Reserve reported that remaining rare-earth resources were estimated to be 20,228,000 t at an ore grade for REM of from 0.22% to 0.30%. According to reserve estimates that had been conducted at Kutessai II at an unspecified time prior to its purchase by Stans, dysprosium represents 6.7% of the total rare earths; terbium, 1.15%; and neodymium, 8.5%. According to these estimates, the ore grades for dysprosium and terbium were among the highest in the world (Burns, 2010).

Mineral Fuels and Related Materials

Natural Gas.—Kyrgyzstan was planning to purchase gas from Turkmenistan starting in 2012 or 2013, which Kyrgyzstan planned to obtain from a newly inaugurated Turkmenistan-China gas pipeline. This new supply would help Kyrgyzstan reduce its dependence on Uzbekistan, which in 2009 was Kyrgyzstan's sole source of imported natural gas. Also, the price of gas from Turkmenistan was expected to be lower than gas from Uzbekistan (M-G-N Capital, 2010d, p. 2).

Uranium.—The Kara-Balta uranium mill's production in 2009 amounted to 2,574 t of uranium compared with 1,096.5 t of uranium produced in 2008. In 2010, the plant planned to

produce 2,000 t of uranium (AKIpress News Agency, 2010). The Kara-Balta mining and metallurgical complex was commissioned in the 1950s for extracting and processing uranium ores. During the Soviet era, the Kara-Balta mining and metallurgical complex processed uranium concentrate from deposits in Kyrgyzstan and Kazakhstan for use in Soviet nuclear powerplants. The Kara-Balta plant also processed other metals besides uranium and refined gold. The Kara-Balta complex contained a hydrometallurgical facility near Bishkek. The annual uranium production capacity of the facility had been listed at 3,600 t of uranium (U) (WISE Uranium Project, 2009).

In 1991, following Kyrgyzstan gaining independence, the Kara-Balta plant ceased processing uranium because of a lack of raw material. Uranium mining had ceased in Kyrgyzstan, and Kara-Balta did not process uranium again until 1994 when it reached an agreement with Kazakhstan to process uranium concentrate from the Stepnoye and Tsentral'noye mining directorates in Kazakhstan into about 450 t/yr of U_3O_8 . In 2000, the Russian Ministry of Atomic Energy restored ties with Kara-Balta, and in July 2000, Kyrgyzstan agreed to a joint-venture arrangement with Kazakhstan and Russia in which additional uranium concentrate from Kazakhstan's Zarechnoye deposit would be processed at Kara-Balta and supplied to the Russian nuclear industry. In 2004, Kazakhstan stopped supplying uranium to Kara-Balta, which caused uranium processing there again to cease.

Ural Platina Holding, which is part of the Russia-based resource investment company Renova Group, is the majority owner of the Kara-Balta plant. In March 2007, the Kyrgyzstan Government accepted a tender from Renova for the Government's 72% stake in the company, which led to an agreement in October 2008 with the Kazakhstan-based Eurasian Development Bank (EDB) to provide \$150 million to develop the mill and properly emplace 50 years of tailings accumulation (World Nuclear Association, 2009).

In 2007, Nimrodel Resources Ltd. acquired 100% ownership of Linia Prava Uranium (LPU). LPU is a joint stock company, registered in Kyrgyzstan, that holds a 90% interest in four exploration licenses granted for the Batkenskaya Oblast' in the southern Fergana Valley in southwestern Kyrgyzstan. The licenses cover an area of more than 3,800 square kilometers that LPU had been exploring actively since 2005. LPU had an office in Bishkek with a staff that included geologists, field support staff, and logistical support and office personnel. In January 2008, LPU acquired a license to explore a 48-square-kilometer portion of the Mailuu-Suu district, which was a significant uranium mining area from 1946 to 1967. The area of the license included five nonworking mines, 23 tailings dams, and 13 mullock sites (mine waste heaps). Geologic surveying was to be conducted around the 5 mines to investigate prospective uranium in the region. A program to drill tailings also was carried out in March and April 2008, and mineralogical and metallurgical studies were to be done to develop parameters for a production plant. On October 23, 2008, Nimrodel Resources Ltd. announced that “In the context of the prevailing global economic uncertainty and current uranium prices, the investigations carried out to date do not support the development of the reprocessing of the Mailuu Suu Tailings in its current form.” However, the scoping

study also established financial parameters and attractive low-cost, modular reprocessing technology, which could be readily applied to large quantities of tailings in diverse locations (Nimrodel Resources Ltd., 2009; WISE Uranium Project, 2009).

Outlook

Kyrgyzstan appears to have the potential to resume mining and processing rare earths and uranium, and the country could become a source of rare earths for world markets. According to Kyrgyzstan's Ministry of Natural Resources, investor activity in Kyrgyzstan was concentrated in areas of gold, natural gas, oil, and uranium exploration (M-G-N Capital, 2010e, p. 5).

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TABLE 1
KYRGYZSTAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2005	2006	2007	2008	2009
METALS					
Antimony:					
Mine output, Sb content ^c	10	50	10	10	10
Metal and compounds	800 ^r	100 ^r	150 ^{r,c}	242 ^r	918
Gold, mine output, Au content kilograms	16,751	10,721	10,559	18,132	16,950
Mercury:					
Mine output, Hg content ^c	200	250	250	250	250
Metal kilograms	303,500	168,900	331,500	290,000 ^{r,c}	320,000 ^c
Molybdenum, mine output, Mo content ^c	250	250	250	250	250
INDUSTRIAL MINERALS					
Cement	972,800	1,059,900	1,229,500	1,218,100	1,100,000 ^c
Fluorspar, concentrate ^c	4,000	4,000	4,000	4,000	4,000
Kaolin ^c	400,000	400,000	400,000	400,000	400,000
Lime, dead-burned	8,500	9,900	12,900	8,700 ^r	8,000 ^c
Salt ^c	1,100	1,100	1,100	1,100	1,100
Sands cubic meters	388,100	514,800	597,900	836,200	800,000 ^c
MINERAL FUELS AND RELATED MATERIALS					
Coal	335,500 ^r	321,300 ^r	395,500 ^r	491,800 ^r	605,000
Natural gas thousand cubic meters	25,100	19,400	15,000	17,300	17,300 ^c
Petroleum, crude	97,200	70,900	68,500	71,000	71,000 ^c
Uranium, processed, U content	NA	NA	NA	1,097	2,574

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. NA Not available.

¹Table includes data available through January 31, 2011.

²In addition to the commodities listed, Kyrgyzstan is believed to produce a number of other mineral commodities, including clays, gypsum, sand and gravel, and silver, but information is not adequate to estimate production.

TABLE 2
KYRGYZSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ⁶
Antimony:			
Sb content of ore	Kadamzhay complex (ATF Invest, a subsidiary of ATF Bank of Kazakhstan, 70.4%): Kadamzhay Mine Terek-Sayskiy Mine Khaydarkan mining and metallurgical complex	Kadamzhayskiy Rayon Khaydarkan region	2,400 ²
Metal and compounds	Kadamzhay metallurgical facility (ATF Invest, a subsidiary of ATF Bank of Kazakhstan, 70.4%)	Kadamzhayskiy Rayon	28,000
Cement	Kantskiy cement plant	Kant	1,500,000
Coal	Seven underground mines and five open pits, which include the following deposits: Almalyk, Dzhergalan, Kara-Kiche-Kok-Yangak, Kyzyl-Kiya, Sulyukta, and Tashkumyr	Southwestern, central, and northeastern parts of the country	2,200,000 ²
Fluorspar, concentrate	Khaydarkan mining and metallurgical complex	Khaydarkan deposit	5,000
Gold:			
Au content of ore	Kumtor Gold Co. (Centerra Gold Inc.)	Kumtor deposit	22
Do.	JCS JerooyAltyn (joint venture of Kyrgyzaltyn Joint Stock Co. and Visor Holding)	Dzher-Uy deposit (open pit)	4 ³
Do.	Makmal gold mining enterprise (Kyrgyzaltyn Joint Stock Co.)	Makmal deposit	3
Do.	JCS JerooyAltyn (joint venture of Kyrgyzaltyn Joint Stock Co. and Visor Holding)	Dzher-Uy deposit (underground)	2 ³
Do.	kilograms Solton-Sary Mine	Narynskaya Oblast'	500
Do.	Altynten LLC (Summer Gold PLC, 60%, and Kyrgyzaltyn Joint Stock Co., 40%)	Taldybulak Levoberezhny deposit	NA
Do.	Talas Copper Gold LLV (joint venture of Gold Fields Orogen Holding Ltd. and Orsu Metals Corp.)	Exploration activity, Talas Valley including the Barkol, Kenash, Korgontash, and Taldybulak-Talas deposits	NA
Do.	Talas Gold Mining Company CJSC	Dzheruy-Bashi, Pereval; Talasskaya Oblast'	NA
Refined	Kara-Balta refinery	Chuyskaya Oblast'	22
Mercury:			
Hg content of ore	Khaydarkan mining and metallurgical complex	Chauvi, Chonkoy, Khaydarkan, and Novoye deposits	700 ²
Metal	do.	Khaydarkan, Batkenskaya Oblast'	1,000
Molybdenum, for nonmetallurgical uses	Kara-Balta mining and metallurgical complex	NA	NA
Do.	Molibden Joint Stock Co.	Chuyskaya Oblast'	NA
Natural gas	million cubic meters OJSC Kyrgyzneftegaz	Approximately 300 wells; Changyr-Tash Chigirchik Pereval, Izbaskentskoye, Kara-Agach, Mayluu-Suu, Susahoye, and Togap-Beshkenskoye deposits	100 ²
Petroleum			
Crude oil	do.	do.	150,000
Refined products	42-gallon barrels Kyrgyz Petroleum Co. (OJSC Kyrgyzneftegaz, 50%, and Petrokyrgyzstan, 50%)	Dzhalal-Abadskaya Oblast'	3,600,000
Rare earths:			
Ore	Aktyuzskiy mining directorate	Kutessai II and Aktyuz-Boordu deposits	300,000
Rare-earth metals	Kyrgyz chemical and metallurgical plant	Orlovka	800
Silver	Karagoyskoye deposit	Oshskaya Oblast'	NA
Do.	Kumyshtag deposit	Talasskaya Oblast'	NA

See footnotes at end of table.

TABLE 2—Continued
 KYRGYZSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ²
Tin	Enil'chek JSC mining enterprise	Atdzhaylau deposit	150
Do.	do.	Trudovoye deposit	350
Do.	Tyanshanolovo mining and beneficiation complex	Sary-Dzhas field	NA
Do.	Uchkoshkon deposit	do.	NA
Tungsten	Enil'chek JSC mining enterprise	Atdzhaylau deposit	90
Do.	do.	Trudovoye deposit	95,600
Uranium, processed	Kara-Balta uranium mill (Renova Group)	Zarechnoye deposit, Chuyskaya Oblast'	3,600
Do.	Linia Prava Uranium (LPU) (Nimrodel Resources, 100%)	Exploration activity, Southern Fergana Valley, Batkenskaya Oblast'	NA

²Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

¹Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

²Capacity estimates are totals for all enterprises that produce that commodity.

³Inactive.