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World rankings for mineral production, shares of world production, and reserves presented in this chapter are derived from the referenced sources. Production data in this chapter may differ from data in other sources because of differences in the date of reporting.

The Mineral Industry of Kazakhstan

By Karine M. Renaud

In 2022, Kazakhstan produced a diverse range of mineral commodities and was the world's leading producer of uranium (43% of world output); the 2d-ranked producer of asbestos (19%), chromite (14%), and magnesium metal (3%) (not including United States production); the 4th-ranked producer of barite (8%) (not including United States production) and titanium sponge (5.6%) (not including United States production); the 5th-ranked producer of bismuth (1.0%), cadmium (4.4%), and ferrosilicon (5%) (not including United States production); the 7th-ranked producer of gold (3.8%), rhenium (0.9%), and sulfur (5.2%); the 8th-ranked producer of zinc (2.5%); the 9th-ranked producer of bauxite (1.1%) (not including United States production) and coal (1.3%); the 10th-ranked producer of antimony (0.4%) and refined copper (1.9%); the 11th-ranked producer of alumina (1.0%) and mined copper (2.7%); the 15th-ranked producer of crude petroleum (1.9%), iron ore (Fe content) (0.6%), silicon metal (0.1%) (not including United States production), and manganese concentrate (0.7%); and the 18th-ranked producer of phosphate rock (0.7%). The mineral industry accounted for a significant share of the country's gross domestic product (GDP) and export revenue; crude petroleum and natural gas were the leading mineral commodities in terms of production value. Kazakhstan's Government promoted the development of the mineral industry and owned interests in a number of significant mineral-commodity-producing companies (table 1; Energy Institute, 2023, p. 15, 39; World Nuclear Association, 2023; World Uranium Association, 2023; Apodaca, 2024; Bray, 2024; Callaghan, 2024; Flanagan, 2024a, b; Gambogi, 2024; Jasinski, 2024; Kim, 2024; Klochko, 2024; McRae, 2024; Merrill, 2024; Polyak, 2024; Schnebele, 2024; Schulte, 2024; Sheaffer, 2024; Tolcin, 2024a, b; Tuck, 2024).

Minerals in the National Economy

In 2022, Kazakhstan's real GDP increased by 3.2% compared with that in 2021, and the nominal GDP was 103.8 trillion tenge (about $225 billion).[1] The share of industrial production in the GDP was 47.0% compared with 44.8% in 2021. Total nominal industrial production was valued at $105.9 billion and real industrial production increased by 1.2% from that in 2021. Mineral extraction played a significant role in industrial production—$54.1 billion, or 51.1% of the value of industrial production, was from this sector. The output value of mineral extraction included $41.3 billion from the extraction of crude petroleum; $6.0 billion from the mining of nonferrous metal ores; $1.5 billion from the mining of iron ore; $1.4 billion from the extraction of coal, including lignite; $781 million from the extraction of natural gas, and $1.1 billion from the extraction of other minerals. In comparison with that in 2021, the real output of mining and quarrying decreased by 0.9%. The output value of iron ore decreased by 20.4%; crude petroleum, by 1.9%; natural gas, by 1.1%; and coal and lignite, by 0.2%; the output value of mined nonferrous metals increased by 5.0%. In 2022, metallurgy contributed $19.6 billion to industrial production, of which nonferrous metallurgy and production of precious metals contributed $12.7 billion, and petroleum refining and coke production accounted for $2.5 billion. Compared with that in 2022, the output value of ferrous metals decreased by 6.9%, whereas the output value of nonferrous and precious metals increased by 6.9%; and that of petroleum refining and coke increased by 1.5% (Agency of Statistics of the Republic of Kazakhstan, 2023, p. 9, 132, 133, 149, 236–239).

Government Policies and Programs

According to a decree that was signed by the President in 2022, three new regions were created in Kazakhstan—Abay Province, Ulytau Province, and Zhetisu Province. Abay Province was created by splitting East Kazakhstan; Ulytau Province, by splitting Qaraghandy Province; and Zhetisu Province, by splitting Almaty Province. The South Kazakhstan Province was renamed as Turkistan Province (Akhmetkali, 2022).

Kazakhstan was a member of Commonwealth of Independent States (CIS). In addition, Kazakhstan was a member of Organization of Turkic States. Kazakhstan joined the Eurasian Economic Union (EAEU) in 2015, which opened up free trade between Kazakhstan and other EAEU members (Armenia, Belarus, Kyrgyzstan, and Russia) and led to new investments in the development of infrastructure projects, including those in the energy and transportation sectors (Ministry of Foreign Affairs of the Republic of Kazakhstan, 2019; Organization of Turkic States, 2023; Soyuz PravoInform LLC, 2023).

KazGeology JSC (KazGeology) was the sole national company involved in exploration activities in Kazakhstan, and it entered into several agreements as a partner with foreign investors. KazGeology provided support to investors by helping them to obtain subsoil use rights, select locations, and conduct geologic exploration. KazGeology developed and implemented the Development Strategy for 2016–25 with the purpose of defining the mission of the company and laying out a strategy for achieving long-term goals and objectives. In 2022, KazGeology conducted exploration activities with foreign and local investors in various exploration projects, including for chromite, copper, gold, nickel-cobalt, iron ore, platinum, and polymetallic ores (KazGeology JSC, 2016, p. 21–34; 2023a–c).

The Ministry of Industry and Construction regulates the chemical industry, geologic study of the subsoil, energy savings and efficiency in the mining and metallurgy sector, industrial development, production of mineral resources and raw materials, and production of precious metals and stones. The Ministry is also responsible for creating economic zones.

[1]Where necessary, values have been converted from Kazakhstani tenge (KZT) to U.S. dollars (US$) at the annual average exchange rates of KTZ460.48=US$1.00 for 2022 and KTZ426.03=US$1.00 for 2021.

Entities under the Ministry of Industry and Construction includeing the Construction Committee, the Geology Committee, the Industrial Development Committee, and the Department of Subsoil Use for Solid Minerals, among others, are involved in establishing Federal policy for subsoil use. According to the Presidential Decree of May 1992, the Committee of Atomic and Energy Supervision, which is under the Ministry of Energy, is responsible for regulating the nuclear industry. The Ministry of Energy also includes such departments as the Department of Subsoil Use, Department of Nuclear Energy and Industry, Department of Oil Development and Production, Department of Oil Transportation and Refining, and others (Ministry of Energy of the Republic of Kazakhstan, 2023b; Ministry of Industry and Construction of the Republic of Kazakhstan, 2023).

In 2017, the President signed into law the updated "Subsoil and Use of Subsoil Code" (Mining Code, or Code) of the Republic of Kazakhstan that went into effect at the end of June 2018. The new code introduced several innovations in an effort to attract new investment and venture capital to the mineral industry. The new code significantly simplified the procedures required to obtain exploration and mining licenses, reduced the time requirements to obtain relevant permits, and created an interactive system to share the Government's geologic information with exploration and mining companies. Since adoption of the Mining Code, several amendments aimed at better coordination with other laws of Kazakhstan and other improvements went into effect (Forbes.kz, 2018; Inform.kz, 2022).

In 2018, an amendment to the Law on Subsoil and Subsoil Use allowed artisanal production of gold in Kazakhstan. The law set the limit on gold production at 50 kilograms per year (kg/yr) for an individual artisan. Individual artisans were not allowed to use heavy machinery in their production. The law was expected to reduce illegal gold mining by allowing small entrepreneurs to mine gold legally. Three years later, by 2021, however, evidence showed that the law was not working as expected. Data from several Provinces demonstrated that the interest in obtaining artisanal mining licenses was very low and that the law did not reduce illegal mining. It appeared that individual miners still preferred informal mining with no restrictions to legal mining as artisans (Zhuravleva, 2020; Yuritsyn, 2021).

Production

In 2022, production of magnesium metal increased by 59% (estimated); silicomanganese, by 45%; salt, by 36%; mined gypsum, by 26%; ferrosilicon and nitrogen, ammonia (N content), by 22% each; silicon metal, by 20%; lignite coal, by 17%; copper (smelter), by 16%; refined lead (secondary), by 14%; mined gold (Au content) and refined copper (other), by 13% each; total copper concentrate and refined gold, by 12% each; and ferrosilicochromium (estimated) and gravel, by 11% each. Production of selenium decreased by 86%; fluorspar, by 82%; mined manganese ore (gross weight) and (Mn) content (estimated), by 72% each; antimony (estimated), by 54%; niobium (metal), by 43%; iron ore (Fe content), by 32%; clay, by 29%; pig iron, by 19%; cadmium (estimated), by 17%; iron ore (gross weight) and steel products, by 16% each; and zinc (smelter), by 12%. Data on mineral production are in table 1.

Structure of the Mineral Industry

As of January 1, 2022, Kazakhstan had 4,838 companies working in the sphere of mining and quarrying, of which 4,640 were small; 91, medium; and 107, large. No companies were fully owned by the Government. JSC NAC Kazatomprom (Kazatomprom) and JSC NK KazMunaiGas were the leading companies partially owned by the Government. Prominent private companies involved in production of minerals were Eurasian Resource Group LLP (ERG) (60% controlled by private owners and 40% by the Government), Kazakhmys plc, KAZ Minerals plc, and Kazzinc LLP. Of all the mining companies operating in Kazakhstan, 442 were owned by foreign entities or individuals; 295 were joint ventures with the participation of foreign capital; 11 were joint ventures with no participation of foreign capital; and the rest were owned by private entities and individuals in Kazakhstan. Of the large companies, 29 were owned by foreign entities or individuals; 27 were joint ventures with the participation of foreign capital; 1 was a joint venture with no participation of foreign capital; and the rest were owned by private entities and individuals in Kazakhstan. Table 2 is a list of major mineral industry facilities (Agency of Statistics of the Republic of Kazakhstan, 2023, p. 183, 217).

Mineral Trade

In 2022, the value of Kazakhstan's exports totaled $84.6 billion, which was a 40.2% increase compared with the value of exports in 2021. Crude petroleum, copper, ferroalloys, flat-rolled steel, and natural gas were the primary sources of export revenue. Overall, in 2022, about two-thirds (68.0%) of Kazakhstan's exports, in terms of value, was from exports of mineral products. Exports of refined copper and copper alloys, in terms of value, increased to $3.7 billion in 2022 from $3.3 billion in 2021; ferroalloys, to $3.2 billion from $2.3 billion; natural gas, to $1.4 billion from $1.3 billion; raw zinc, to $834 million from $734 million; raw lead, to $170 million from $127 million; and coal, to $932 million from $497 million. The export value of crude petroleum and natural gas concentrate increased to $46.9 billion from $31.1 billion. The export value of iron ores and concentrates, including iron ore pellets, in terms of value, decreased to $681 million from $1.6 billion; and that of flat-rolled steel products, including white tin, to $1.6 billion from $1.9 billion (Agency of Statistics of the Republic of Kazakhstan, 2023, p. 306, 317, 409–410).

Kazakhstan's main export partner was Italy, which received 16.4%, by value, of the country's exports. It was followed by China (15.4%), Russia (10.8%), the Netherlands (6.5%), Turkey (5.6%) the Republic of Korea (5.4%), Uzbekistan (4.3%), and France (3.6%) (Agency of Statistics of the Republic of Kazakhstan, 2023, p. 310–312).

In 2022, the value of Kazakhstan's imports increased by 23% to $50.9 billion compared with that in 2021. Overall, in 2022, 6.3% of Kazakhstan's imports, in terms of value, was from imports of mineral products. The major import categories were petroleum products, steel pipes, natural gas, and coal. The value of imports of petroleum products increased to $817 million from $556 million in 2021; steel pipes, to $738 million from $520 million; and coal, to $81 million from $60 million.

The value of imports of natural decreased to $232 million from $273 million. Kazakhstan's main import partner was Russia, which supplied 35.1% of Kazakhstan's total imports, by value. It was followed by China (21.9%), Germany (4.4%), the United States (3.7%), the Republic of Korea and Turkey (3.1% each), Uzbekistan (2.5%), Japan (2.2%), and Italy (2.1%) (Agency of Statistics of the Republic of Kazakhstan, 2023, p. 306, 314–316, 410–411).

Commodity Review

Metals

Chromium and Ferroalloys.—In 2022, JSC TNK Kazchrome (Kazchrome), which was a division of ERG, was the major producer of chromite and ferroalloys in Kazakhstan. Kazchrome had four major production units—the Aksu ferroalloys plant, located in Pavlodar Province; the Aktobe ferroalloys plant, located in the city of Aqtobe; the Kazmarganets Mining Enterprise's Tur manganese mine, which is located in Qaraghandy Province—all of which were involved in manganese mining—and the Donskoy chromite GOK (GOK is the abbreviation for gorno-obogatitelnyi kombinat, which translates as "mining and beneficiation complex"), which was located in the city of Khromtau in Aqtobe Province and was involved in chromite mining and processing. In 2022, Kazchrome's Donskoy GOK produced 4.8 million metric tons (Mt) of chromite ore, which was a 7.0% decrease compared with 2021 production. In 2022, Kazchrome produced 1.7 Mt of ferroalloys, which was 1.3% more than production in 2021. Also in 2022, the company exported about 1.5 Mt of ferroalloys (tables 1, 2; JSC TNK Kazchrome, 2021, p. 10; 2022, p. 3).

Kazchrome signed several expansion and exploration contracts with the Government for chromite, manganese, and polymetallic ore. In 2022, the Donskoy GOK continued to expand the production capacity of the 10-years of Independence of Kazakhstan and Molodyezhnaya Mines to 6 million metric tons per year (Mt/yr) or more. As a result, the production of ferroalloys was expected to increase as well. The expansion activities were expected to be completed in 2023. The company conducted exploration for chromite at Bil'ge, Dubersai, Geologicheskiy I, Geophizicheskiy-IX, Iyun'skiy, and Yuzhno-Kempirsayskoiy in the Daul'sko-Kokpektinskaya area and at the Karakuduk polymetallic deposit. In 2023, the company was expected to use underground mining methods to mine the 20 years KazSSR, Geologicheskoye-I, and Yuznoye Mines. The total "balanced" reserves (of high-quality and not difficult to mine) at the Donskoy GOK were estimated to be 298.1 Mt grading 51.7% Cr_2O_3. In 2022, the resources of the Tur Mine were reestimated and the mine area expected to be expanded. The Tur Mine's resources were estimated to be 171,000 metric tons (t) grading 27.5% manganese and 8% iron (JSC TNK Kazchrome, 2022, p. 3, 13, 25, 32–34).

In 2022, EkibastuzFerroAlloys LLP continued work on the construction of a ferroalloys plant located in the city of Ekibastuz, Pavlodar Province, in close proximity to the Ekibastuz GRES-1 hydroelectric powerplant. In December 2021, EkibastuzFerroAlloys LLP announced that it was able to obtain financing for the construction of a new ferrosilicon plant. The total cost of the project was $233 million, of which $169 million was a credit line from the AO Bank for Development of Kazakhstan and the rest was financed by private investors. The new plant had a planned capacity of 240,000 metric tons per year (t/yr) of high-grade ferrosilicon and was expected to create 1,500 jobs during construction and 800 permanent jobs when it was commissioned (Advis.ru, 2021; Rossaprimavera.ru, 2022; EkibastuzFerroAlloys LLP, undated).

Mineral Product International LLP worked with Sac Co. of the Republic of Korea on implementation of a joint-venture project located in the city of Ekibastuz, Pavlodar Province. The new plant would have eight 33-megawatt furnaces, and the capacity to produce 160,000 t/yr of high-grade ferrosilicon, as well as other products, such as ferromanganese and silicomanganese. The plant was expected to be commissioned in 2026. The output would be exported to Japan, the Republic of Korea, and the United States (Mineral Product International LLP, 2023).

Cobalt and Nickel.—In 2022, JSC Fincraft Resources (Fincraft Resources), through Kaznickel LLP, continued exploration of the Gornostayevskoye cobalt-nickel deposit, which is located in Abay Province close to the Kazakhstan-China border. Fincraft Resources held a 93.43% stake in Ferronickel Plant Ertis LLP. Ferronickel Plant Ertis LLP held a 100% stake in Kaznickel LLP; however, in 2020, Kaznickel's 100% stake was transferred to Battery Metals Technologies LLP, in which Kaznickel held a 93.43% stake. Fincraft Resources planned to construct nickel-cobalt production facilities starting at the beginning of 2024 and to reach full production by 2026. The plant was expected to refine 1.6 Mt/yr of ore and produce 13,500 t/yr of nickel and about 1 t/yr of cobalt contained in concentrate (JSC Fincraft Resources, 2020, p. 5–6, 22, 49; Kursiv media, 2023, p. 6).

Copper.—In 2022, Kazakhstan produced 721,000 t of total copper in concentrate and 344,410 t of smelted copper, which was a 12% and 16% increase, respectively, compared with production in 2021, and 494,000 t of refined copper in Kazakhstan, which was an 11.5% increase. The leading copper concentrate producers in Kazakhstan were KAZ Minerals Ltd. (Kaz Minerals), which had operations in Abay, Pavlodar, and Shyghys Qazaqstan (East Kazakhstan) Provinces; Kazakhmys Corp. LLP (Kazakhmys), which had operations in Abay, Qaraghandy, Ulytau, and Zhambyl Provinces; Aktyubinskaya Mednaya Kompaniya LLP (AMK) [a subsidiary of Russian Copper Co. (RMK) of Russia], which operated in Aqtobe Province; Kazzinc LLP (Kazzinc) (Glencore plc of Switzerland, 69.61%), which operated in Shyghys Qazaqstan Province; and Polymetal International plc, which operated in Qostanay Province. The production of refined copper took place predominantly in Shyghys Qazaqstan Province, Qaraghandy Province, and Ulytau Province (tables 1, 2).

Kazakhmys exported most of its copper concentrate (Cu content) to China and Turkey. Out of 251,000 t of copper concentrate (Cu content), 177,000 t was exported to China and 72,000 t was exported to Turkey. In 2022, Kazakhmys began development of the Zhaisan deposit through its subsidiary Zhanashyr Project LLP. The total investment for the project was $118 million. The production of 300,000 t/yr ore was expected to start in 2023 and to increase to 600,000 t/yr in 2024. The mined ore was expected to be processed at the Balkhash concentrator (JSC Kazakhmys Copper, 2022, p. 20–22, 30, 54; Kazakhmys Corp. LLP, 2023; MINEX Forum, 2023b).

The Russian Copper Co. (RMK) of Russia was operating the 50th Anniversary October Mine using an open pit mining method between 2006 and 2019. RMK was planning to start mining in the 50th Anniversary October Mine in 2024 using an underground mining method. The underground geologic reserves were estimated to be 9.7 Mt, containing 169,500 t of copper at an average grade of 1.75% Cu (table 2; Vestnik Zolotopromyshlennika, 2021).

In 2022, Irkaz Metal Corp. LLP launched the hydrometallurgical plant at the Borly copper deposit in Qaraghandy Province. The production capacity of the plant was expected to be 5,000 t/yr of copper cathode. The plant was expected to employ 140 workers. Although the Borly deposit had been explored for quite some time, the development had begun only recently (Kazakhstan Forbes, 2022; PromoGroup Media KZ LLP, 2022a).

Gold.—According to the World Gold Council, gold reserves in Kazakhstan were estimated to be 1,000 t at yearend 2022. Kazakhstan ranked second in gold reserves in Central Asia after Uzbekistan. In 2022, Kazakhstan produced 129,794 kilograms (kg) of mined gold, which was a 13% increase compared with 2021 production, and 73,041 kg of refined gold, a 12% increase compared with that in 2021. The leading producers of mined gold in Kazakhstan were JSC Altyntau-Kokshetau (which was owned by Kazzinc LLP) and JSC GMK Kazakhaltyn, both of which had operations in Aqmola Province, and Polymetal International plc (Polymetal) (Anglo-Russian), which was one of leading producers of precious metals in Russia and operated in Shyghys Qazaqstan and Qostanay Provinces. JSC AK Altynalmas operated in Qaraghandy Province and Zhambyl Province (tables 1, 2; Sheaffer, 2024).

In Kazakhstan, gold deposits were classified into three types—complex deposits, lode deposits, and stockwork deposits. Examples of complex deposits are the Ridder-Sokol'noye and the Tishinskoye copper-gold deposits. Lode deposits include the Akbakay, the Aksu, and the Bestobe deposits. Examples of stockwork deposits include the Bakyrchik, the Bol'shevik, and the Vasil'kovskoe deposits. There were also few deposits of the skarn type, but they were limited to about 2% of all gold deposits in Kazakhstan (Kazspecgeo.com, 2020).

Kazakhstan was in the process of building five new gold-processing plants, all of which were expected to be completed by 2024. The new plants would have the capacity to produce about 14,800 kg/yr of gold dore alloy. As a result, Kazakhstan was expected to increase gold production to 132,900 kg in 2024. According to the Ministry of Industry and Construction of the Republic of Kazakhstan [also known as the Ministry of Industry and Infrastructure Development of the Republic of Kazakhstan (MIIR)], Golden Compass Capital was expected to commission the second stage of the gold-processing plant at the Kokkia Mine in Zhambyl Province by the end of 2021. The plant was planned to double its production to between 430 and 570 kg/yr of gold. Originally, the gold-processing plant was expected to be completed in 2020, but for various reasons, including the global coronavirus disease 2019 (COVID-19) pandemic, completion of the plant was postponed. There was no further detailed information available about the plant in 2022 (Gold.1prime.ru, 2021; Karyagina and Sagitov, 2022, p. 24–25).

Eastern Gold Co. (100% owned by JSC Altyn Samruk Qazan) conducted exploration, mining, and processing activities at gold-bearing areas; the company's exploration license was for 6 years. As of the beginning of 2023, Eastern Gold had completed exploration activities at the Rodnikovoe and the Belaya Gorka deposits in Abay Province. The ore from the Rodnikonoye deposit was expected to be processed by using heap leaching. Once the mines are developed, the production capacity of the Rodnikovoe Mine was expected to be 200,000 t/yr of gold ore, and that for the Belaya Gorka Mine, 290,000 t/yr of gold. The company was expected to begin operations and launch the gold recovery plant in May 2024 (Nurzhanuly, 2023, p. 4–5; SkyBridge Invest, 2023, p. 4–6).

JSC Altyntau-Kokshetau was expected to operate the Vasil'kovskoe Mine using an open pit mining method between 2023 and 2026. After 2026, the company was expected to process "off-balance" ores (that is, ores that are difficult to mine and have a low quality) from the warehouse. As of 2022, the Vasil'kovskoe Mine had proven reserves of 370,000 kg with a gold content of 2.8 grams per metric ton (g/t) and the Bakyrchik had proven reserves of 326,000 kg with a gold content of 7.7 g/t (Inbusiness.kz, 2023).

The Aksu and the Bestobe Mines, operated by JSC GMK Kazakhaltyn, were classified as medium in size. The production capacity at the Aksu Mine was 770 kg/yr of gold. The Bestobe Mine produced 1,360 kg/yr of gold (table 2; Verkhozin, 2024).

In 2022, Polymetal produced gold at two of its projects—the Varvara hub in Qostanay Province, which included the Komar Mine and the Varvara Mine, and the Kyzyl project in Shyghys Qazaqstan Province, which included the East Bakyrchik Mine. In 2022, the Varvara hub produced a total of 211,000 troy ounces (6,600 kg) of gold equivalent, which was a 7% increase compared with production in 2021. The increase in production was related to higher metal content in the ore and higher extraction rates owing to improvements in technological processes. At the same time, production at the Kyzyl project decreased by 8% to 330,000 troy ounces (10,300 kg) of gold equivalent. The decrease in production was owing to a decrease in the grade of the ore, which was partially mitigated by an increase in the capacity of the gold-processing plant to 2.2 Mt/yr (table 2; Polymetal International plc, 2022a, p. 32–33).

In 2022, Polymetal continued with its exploration in the South Elevation area of the Komar deposit and the Baksy and Shekara deposits, which are associated with the company's Varvara hub (or unit). The company obtained a 7.5% stake in the copper-gold Baksy deposit in 2019 and had an option to increase its stake to 75% after completing a 3-year exploration project. The mineral resources in the Baksy deposit were estimated to be 768,000 t of ore grading 1.9% Cu with a cutoff grade of 2.8 g/t gold (Polymetal International plc, 2022a, p. 32–33; JSC AEI Prime, 2023).

As of January 2022, the proven reserves in the Kyzyl project–Bozymchak (zone 1) were estimated to be 6.1 Mt at a grade of 5.9 g/t gold (or 54,000 kg of gold content); probable reserves were estimated to be 51.5 Mt at a grade of 5.2 g/t gold (or 270,000 kg of gold content); measured, indicated, and inferred resources were estimated to be 13.2 Mt at a grade of 3.9 g/t gold (or 51,900 kg of gold content). The proved and probable

reserves at the Varvara hub, including the Varvara, the Komar, and the Elevator deposits, were estimated to be 60.6 Mt at an average grade of 1.2 g/t gold (or 72,200 kg of gold content); the measured, indicated, and inferred resources were estimated to be 27.8 Mt at average grades of 1.1 to 1.6 g/t gold and 0.51% copper (or 17,800 t of copper contenet) (Polymetal International plc, 2022b, p. 5, 9–16).

JSC Maykainzoloto was operating the Maykain B and Alpys Mines in Pavlodar Province. As of January 1, 2022, the off-balance reserves of Maykain B were estimated to be 7.2 Mt. The balanced reserves were estimated to be 14.6 Mt at grades of 2.6 g/t gold, 40.1 g/t silver, 1.19% Cu, and 1.99% Zn, and to contain 38,080 kg of gold, 586.3 t of silver, 173,800 t of copper, and 290,900 t of zinc. The company was expected to start mining the low horizons of the Maykain B deposit (PromoGroup Media KZ LLP, 2023d).

In 2022, RG Gold LLP, which was a subsidiary of Vernyi Kapital, started producing gold from the South and North Raygorodok Mines, which had a combined production capacity of 4,500 kg/yr of gold. The company employed more than 300 people (table 2; Vestnik Zolotopromyshlennika, 2023; RG Gold LLP, undated).

Aina Resources Co. planned to finish construction of a beneficiation and processing plant with a capacity of 320 kg/yr of gold dore at the Akbeyit deposit in Akmola Province by the end of 2023. Monterra Group AG of Germany planned to commission the development of a GOK in the Karatas-Maybulak area in Zhambyl Province. The company invested 832 billion tenge (about $1.81 billion). The GOK would have the capacity to produce 10,000 kg/yr of gold dore. The GOK in Zhambyl Province was expected to be developed in three stages between 2026 and 2029 (Gold.1prime.ru, 2021; PromoGroup Media KZ LLP, 2022b, 2023c).

Manganese.—The Zhomart Mine located in Ulytau Province was mothballed (the date was not specified). The mine was operated by JSC Marganets Zhayrema. In 2024, the company planned to resume mining in the Zhomart Mine until 2033. The ore would be processed in the Zhayrema concentrator at the Zhayrema GOK. The production capacity of the concentrator was expected to be 270,000 t/yr of finished products from 750,000 t/yr of ore (MINEX Forum, 2023a; PromoGroup Media KZ LLP, 2023a).

Molybdenum, Nickel, and Vanadium.—In March 2019, Ferro-Alloy Resources Ltd. (FAR), which was registered in Guernsey [United Kingdom], conducted an initial public offering (IPO) at the London Stock Exchange and attracted about $7 million in investment. In January 2020, FAR conducted another IPO at the Astana Stock Exchange. FAR owned a 100% share in Balausa Firm LLP, which had a production license for the Balasausqandyq vanadium deposit in Qyzylorda Province. In 2022, Balausa Firm produced 306 t of vanadium pentoxide, which was an increase of 17.9% from production in 2021 (259.6 t); 36 t of molybdenum (in ferro-molybdenum) which was a decrease of 7% from production in 2021 (38.7 t); and 57 t of nickel concentrate (for half of 2022). The production of nickel concentrate was disrupted for various reasons, including (1) the slow reopening of the global economy after COVID-19 lockdowns, (2) local unrest in January 2022, and (3) the Russia-Ukraine conflict, which caused disruptions in supply and transport networks and increases in transportation costs (table 2; Ferro-Alloy Resources Group, 2017; Forbes.kz, 2019; Ferro-Alloy Resources Ltd., 2022, p. 3; 2023, p. 2).

Industrial Minerals

Cement.—In 2022, Kazakhstan produced 12.1 Mt of cement, which was a 1.7% decrease compared production in 2021. As of 2022, the 17 cement producers in Kazakhstan had a total design capacity of 17.6 Mt/yr of cement. On January 10, 2022, International Cement Group of Singapore temporarily suspended cement production at the Alacem plant in Almaty Province owing to nationwide political unrest. The company resumed operations on January 19, 2022 (table 1; Global Cement, 2022a, b).

Mineral Fuels and Related Materials

Coal.—In 2022, as a result of an embargo on coal from Russia and increased coal demand by European countries, the production of coal in Kazakhstan increased by about 1.8% to 114 Mt. For the domestic market, 64.4 Mt of coal was shipped to electricity-producing companies, which was an 8% increase compared with the amount shipped in 2021; industrial coal consumers received 6.0 Mt, which was a 12% decrease compared with that in 2021; and residential customers received 11.0 Mt, which was a 3% increase compared with that in 2021. Coal prices in Kazakhstan increased on the domestic market (table 1; Inbusiness.kz, 2021; Kapital.kz, 2022; PromoGroup Media KZ LLP, 2023b).

According to the Ministry of Environment, Geology and Natural Resources, the Government planned to stop using coal by 2060, and the development of the "Doctrine of Carbon Neutral Development until 2060" (a national strategy for carbon neutrality) was under development. Under this strategy, the share of coal in electricity production would be reduced to 40.1% by 2030 from 69% in 2022. According to preliminary calculations by the Government, to reach this goal, the share of renewable sources of energy would need to be increased to 24% by 2030 (from 4.5% in 2022), and the share of natural gas would need to be increased to 25% (Official Information Resource of the Prime Minister of the Republic of Kazakhstan, 2021; United Nations Development Programme, 2021; Satubaldina, 2023).

JSC ArcelorMittal Temirtau operated eight coal mines in and around Qaraghandy Province. In 2022, the Government renewed the subsoil use contract and 20-year license for all eight coal mines. In recent years, ArcelorMittal Temirtau faced safety challenges. In 2022, there was a roof collapse in the Temirtau coal mine and an explosion in the Lenina coal mine, which resulted in production stoppages during November and December 2022. Production was expected to gradually increase to full capacity by the second quarter of 2023. As of December 31, 2022, the total proven and probable coal reserves of ArcelorMittal Temirtau were estimated to be 208 Mt; measured and indicated resources were estimated to be 1.14 billion metric tons; and inferred resource were

estimated to be 53 Mt (table 2; ArcelorMittal S.A., 2023, p. 29, 143, 146–148).

Petroleum.—In 2022, Kazakhstan decreased crude petroleum production by 1.9% to 612 million barrels. Kazakhstan was ranked second in petroleum production after Russia among the CIS countries. In 2022, investors from 15 countries contributed to crude petroleum production in Kazakhstan. Some of the petroleum companies from Europe, China, Russia, and the United States operating in Kazakhstan had consortiums and joint ventures with local JSC NK KazMunaiGas. In 2022, three large projects—the Tengiz project, the Karachaganak project, and the Kashagan project—were operated by Tengizchevroil LLP, Karachaganak Petroleum Operating B.V., and North Caspian Operating Co., respectively. The Tengiz, Karachaganak, and Kashagan projects produced 214 million barrels (Mbbl), 82 Mbbl, and 93 Mbbl. The projects were expecting to increase production—Tengiz to 204 Mbbl and Kashagan to 133 Mbbl. The Karachaganak was expected to decrease production to 81 Mbbl (tables 1, 2; Ishekenova, 2021; Energy Institute, 2023, p. 16; Ministry of Energy of the Republic of Kazakhstan, 2023a).

Uranium.—Kazakhstan had been the world leader in uranium production since 2009 and had increased production in the past 25 years by 27-fold—from 796 t in 1997 to 21,300 t in 2022. In 2022, Kazakhstan produced 21,300 t of uranium, which was a 2.4% decrease compared with that in 2021 and accounted for 43% of the total world uranium production. JSC NAC Kazatomprom (Kazatomprom) was the leading producer of uranium in Kazakhstan and in the world and carried out with its subsidiaries development at 26 sites combined in 14 mining assets and was responsible for more than 50% of the uranium production in the country. Kazatomprom had produced uranium using the in-situ leaching method (tables 1, 2; Sputnik.kz, 2021; JSC NAC Kazatomprom, 2022; World Nuclear Association, 2023; World Uranium Association, 2023).

Outlook

Interest in Kazakhstan's mineral industry—particularly in the production of chromium, cobalt, copper, gold, ferroalloys, nickel, and vanadium—will likely continue to increase, and the number of projects for extracting the country's significant mineral resources will also likely increase. This is especially true because of the Government's adoption of the amendments to the Mining Code, which, among other goals, are aimed at better protecting investors. The number of exploration projects underway in Kazakhstan indicates the potential for future increases in the country's mineral production. According to Kazatomprom's 2025 production strategy, the company is expected to increase uranium production by 48% from 2022 to 2025. Uranium production is expected to be between 30,500 t and 31,500 t of uranium by 2025. The decision to increase uranium production was based on improved uranium market conditions and successful contracting activities (JSC NAC Kazatomprom, 2023, undated). Nonetheless, the future development of Kazakhstan's mineral industry will depend on a variety of factors, including mineral commodity prices and the development of Government policies and programs to encourage the growth of the industry.

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TABLE 1
KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2018	2019	2020	2021	2022
METALS						
Aluminum:						
Bauxite		5,700,000	4,118,400	4,057,800	4,370,100	4,400,000
Alumina		1,481,000	1,393,411	1,393,000	1,315,000 r	1,338,000
Metal, primary		258,400	277,718	281,600	278,967	261,587
Antimony, mine, concentrate, Sb content[e]		100	500	670 r	650	300
Beryllium, products, metallurgical		1,712	1,688	1,365	1,403	1,295
Bismuth, refinery[e]		280	230	230	200 r	190
Cadmium, refinery, primary		1,500 e	1,500 e	1,200	1,200	1,000 e
Chromium, mine, chromite:						
Ore		6,688,800	7,018,900	6,326,400	6,192,000	5,716,900
Concentrate		4,965,000	5,133,100	4,129,300	3,969,700	3,828,500
Copper:						
Mine, concentrate, Cu content:						
Concentrate		640,000 r	670,000 r	650,000 r	600,000 r	680,000
Solvent extraction[3]		42,700	39,500	38,200	41,300	41,400
Total		683,000	710,000	688,000	641,000	721,000
Smelter, primary		327,314	371,359	378,618	296,683	344,410
Refinery, primary:						
Leaching, electrowon		42,700	39,500	38,200	41,300	41,400
Other		438,115	472,327	477,016	401,883 r	453,003
Total		481,000	512,000	515,000	443,000	494,000
Ferroalloys:						
Ferrochromium		1,740,000 e	1,858,130	1,841,309	1,704,561	1,658,378
Ferrosilicon		65,405	79,930	180,645	148,023	180,399
Ferrosilicochromium		110,000 e	113,980	69,877	85,335	95,000 e
Silicomanganese		137,710	123,464	122,743	132,119	191,945
Other, unspecified		46	263	78	--	-- e
Total		2,050,000	2,180,000	2,210,000	2,070,000	2,130,000
Gold:						
Mine, Au content	kilograms	100,288	106,559	116,964	114,843	129,794
Refinery	do.	53,100	61,080	67,846	64,991	73,041
Iron ore, mine:						
Gross weight		41,876,500	45,221,900	62,865,000	64,089,700	53,623,600
Fe content		11,727,600	11,642,900	12,673,200	13,120,600	8,889,800
Iron and steel:						
Pig iron		3,174,100	3,208,700	3,212,400	3,623,800	2,920,000
Steel:						
Raw steel		4,006,000	4,130,600	4,009,400	4,499,000	4,149,587
Products, finished, rolled		2,546,900	2,036,700	2,564,100	3,056,800	2,582,900
Lead:						
Mine, Pb content		86,500	55,700	30,200	29,900	30,000
Refinery:						
Primary		132,000 e	115,000 e	112,000 e	105,000 e	106,000
Secondary		21,000 e	18,000 e	16,000 e	14,000 e	16,000
Magnesium, metal, primary[e, 4]		17,000	25,000	16,000	17,000 r	27,000
Manganese, mine:						
Crude ore:						
Gross weight		1,427,300	1,142,300	813,500	1,248,700	349,000
Mn content[e]		273,000	217,000	155,000	237,000	66,000
Concentrate:						
Gross weight		434,000	460,000	276,300	370,700	389,900
Mn content		143,000 e	152,000 e	91,300 e	122,000	129,000
Niobium, metal, niobium products, Nb content		26	14	15	14	8
Rhenium, Re content[e]	kilograms	1,000	500	500	500	500

See footnotes at end of table.

TABLE 1—Continued
KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons, gross weight, unless otherwise specified)

Commodity[2]		2018	2019	2020	2021	2022
METALS—Continued						
Selenium		1 e	3	4	7	1
Silicon, metal		14,000	13,000 e	5,000 e	6,000 r	7,200
Silver:						
Mine, Ag content	kilograms	369,000 e	1,022,068 r	1,035,181 r	1,004,789 r	1,052,858
Refinery, primary	do.	959,000	1,007,671	1,015,756	982,545	997,550
Tantalum, metal, Ta content		132	121	150	163	165
Titanium:						
Ilmenite and leucoxene[e]		10,000	15,000	12,000	14,000 r	14,000
Sponge		16,000 e	23,000 e	15,000 e	14,000 r, e	15,300
Zinc:						
Mine, concentrate, Zn content		349,000 r	322,000 r	344,000 r	318,000 r	312,000
Smelter, primary and secondary		317,965	318,399	311,322	300,886	266,184
INDUSTRIAL MINERALS						
Asbestos, all grades		202,900	210,700	227,400	250,100	250,200
Barite, ore and concentrate		570,000 e	530,600	445,300	600,000 r, e	650,000 e
Cement, hydraulic[5]	thousand metric tons	9,913	10,268	10,962	12,313	12,099
Clays, unspecified[6]	do.	6,082 r, 5	11,677 5	10,350	6,613	4,695
Fluorspar		80,000 e	87,800	74,500	67,000	12,100
Gypsum, mine		121,400	78,200	94,500	184,700	233,400
Lime		886,000	874,500	830,900	933,600	946,300
Nitrogen, ammonia, N content		172,610	178,260	178,720	213,280	259,194
Phosphate rock:						
Gross weight		1,250,000	1,273,900	1,495,100	1,398,100	1,403,100
P_2O_5 content		312,500	318,500	373,800	349,500	350,775
Salt		885,717	1,094,659	1,237,455	1,231,996	1,678,469
Stone, sand, and gravel, construction:						
Sand and gravel, unspecified:						
Sand[7]	thousand metric tons	17,100	23,200	23,300	20,400	20,200
Gravel[8]	do.	71,500	72,400	82,500	64,600	71,900
Stone:						
Crushed:						
Limestone	thousand metric tons	15,932	15,668	16,678	17,166	18,011
Chalk and dolomite	do.	1,755	1,892	1,895	1,927	1,990
Size and shape unspecified[9]	do.	15,700	13,100	12,300	12,000	13,000
Sulfur:						
Byproduct, S content:						
Metallurgy[e]		600,000	600,000	600,000	610,000	610,000
Natural gas and petroleum		2,910,000 e	4,036,000	3,876,400	3,993,100	3,687,600
Total		3,510,000	4,640,000	4,480,000	4,600,000	4,300,000
Compounds, sulfuric acid		2,297,400	2,290,800	2,140,400	2,208,400	2,254,500
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous		107,595,900	104,809,100	104,084,100	107,246,300	108,043,900
Lignite		6,560,700	5,928,900	5,422,100	4,828,700	5,663,600
Total		114,000,000	111,000,000	110,000,000	112,000,000	114,000,000
Coke, metallurgical		2,839,200	2,604,800	2,387,800	2,439,900	2,440,100
Natural gas:						
Associated	thousand cubic meters	32,785,300	34,524,300	32,261,100	32,670,900	31,955,500
Nonassociated	do.	22,668,200	22,157,000	23,117,500	21,508,200	21,689,800
Total	do.	55,500,000	56,700,000	55,400,000	54,200,000	53,700,000
Petroleum:						
Crude, including condensate[10]	42-gallon barrels	657,000,000	658,000,000	622,000,000	624,000,000	612,000,000
Refinery[11]	do.	106,000,000	111,000,000	147,000,000	156,000,000	160,000,000 e
Uranium, mine, U content		21,705	22,761	19,477	21,819	21,300

See footnotes at end of table.

TABLE 1—Continued

KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1]

[e]Estimated. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through November 30, 2023. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]In addition to the commodities listed, cesium, cobalt, germanium, indium, molybdenum, nickel, scandium, selenium, tellurium, and vanadium may have been produced, but available information was inadequate to make reliable estimates of output.

[3]The copper content of solvent extraction output at the mine level is the same as electrowon refinery output; however, copper produced in the solvent extraction and electrowinning process is typically reported only at the refinery level.

[4]Includes magnesium used in production of titanium sponge.

[5]Excludes white cement.

[6]Includes kaolin.

[7]Converted from cubic meters assuming a density of 1.5 metric tons per cubic meter.

[8]Converted from cubic meters assuming a density of 1.68 metric tons per cubic meter.

[9]Converted from cubic meters assuming a density of 1.6 metric tons per cubic meter.

[10]Figures were converted to barrels from metric tons, which were reported as follows: 2018—90,359,500; 2019—90,555,400; 2020—85,656,100; 2021—85,879,400; and 2022—84,236,900.

[11]Figures were converted to barrels from metric tons, which were reported as follows: 2018—13,400,100; 2019—14,037,600; 2020—18,318,800; 2021—19,493,500; and 2022—19,500,000[e].

TABLE 2

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Aluminum:			
Bauxite	JSC Kazakhstan Aluminium Smelter [Eurasian Resources Group LLP (ERG), private, 60%, and Government, 40%]	Torgayskoye (Amangeldy region)[2] and Krasnooktyabrskoye mining complexes, Qostanay Province	3,700,000
Do.	do.	Krasnogorsky site, Qostanay Province	300,000
Do.	do.	Mine No. 9, Qostanay Province	1,000,000
Alumina	JSC Aluminium of Kazakhstan [Eurasian Resources Group LLP (ERG), private, 60%, and Government, 40%]	Plant in the city of Pavlodar, Pavlodar Province	1,600,000
Aluminum, primary	Kazakhstan Electrolysis Plant (KEZ) (also known as Pavlodar Aluminum Plant) [Eurasian Resources Group LLP (ERG), private, 60%, and Government, 40%]	do.	280,000
Antimony, mine, concentrate, Sb content	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Lead plant, Ust-Kamenogorsk metallurgical complex, Shyghys Qazaqstan Province	700
Asbestos	JSC Kostanay Minerals	Mine in Zhitikara, Qostanay Province	250,000
Barite	Barite Oil Kentau LLC	Ansay Mine, Kentau District, Turkistan Province[3]	NA
Do.	Dostau-Litos LLP	Ushtobe Mine, Qaraghandy Province	NA
Do.	Global Chemicals Industries LLP	Bestobe (Baritovaya Gorka) Mine, Qaraghandy Province	200,000
Do.	JSC Marganets Zhairema [JSC Zhairemskiy GOK,[4] 100% (Kazzinc LLP)]	Ushkatyn III Mine, Ulytau Province	NA
Do.	do.	Zhumanay deposit, Ulytau Province	200,000
Do.	JSC PC Yuzhpolimetall[5]	Kentau GOK,[4] Turkistan Province	NA
Do.	JSC Zhairemskiy GOK[4] [Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)]	Dal'nezapadniy and Zapadniy Mines in Zhairem GOK,[4] Ulytau Province	168,000
Do.	Mining Technology KZ LLP	Kentobe Mine, Qaraghandy Province	NA
Do.	Orda Group LLP	do.	200,000
Do.	Stroyservice LLC	Severnoye Dolomitovoye Mine, Kentau District, Turkistan Province	37,000
Do.	Vostochnoye Rudoupravleniye LLP	Chiganak Mine, Zhambyl Province	300,000
Do.	do.	Ul'kensay (West and East areas), Zhambyl Province	40,000
Beryllium, metal	JSC NAK Kazatomprom	Ulba metallurgical plant, Oskemen (also known as Ust-Kamenogorsk), Shyghys Qazaqstan Province	1,300
Bismuth, metal	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Lead plant, Ust-Kamenogorsk metallurgical complex, Shyghys Qazaqstan Province	270
Do.	JSC PC Yuzhpolimetall[5]	Shymkent metallurgical plant, Turkistan Province[6]	NA
Cadmium, metal	do.	do.	NA
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Zinc refinery, Oskemen (also known as Ust-Kamenogorsk), Shyghys Qazaqstan Province	1,200
Cement	Alacem LLP (International Cement Group)	Alacem plant in Almaty Province	1,200,000
Do.	Bukhtarma Cement Co. (Heidelberg Materials)	Plant in Shyghys Qazaqstan Province	1,400,000
Do.	Gezhouba Shieli Cement Co. LLC (Gezhouba Group Corp. Ltd., 50%; Gezhouba Group Overseas Investment Co. Ltd., 20%; local company, 30%)	Plant in Qyzylorda Province	1,000,000
Do.	Jambyl Cement Production Co. LLP (Vicat Group, 90%, and World Bank IFC, 10%)	Plant in Zhambyl Province	1,500,000
Do.	Jambyl Nedr LLP	do.	300,000
Do.	JSC ACIG	do.	500,000
Do.	JSC Central Asia Cement (Steppe Cement Ltd., 100%)	Plant in Qaraghandy Province	800,000
Do.	JSC Karcement (Steppe Cement Ltd., 100%)	do.	1,200,000
Do.	JSC ShymkentCement (Heidelberg Materials)	Plant in Turkistan Province	1,300,000

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Cement—Continued	KaspiyCement (Heidelberg Materials)	Plant in Mangghystau Province	800,000
Do.	Kazakhcement LLP [Sharcem LLP (International Cement Group, 60%, and Kazakh Invest, 40%)	Plant in Shyghys Qazaqstan Province	1,200,000
Do.	Kokshe-Cement LLP	Plant in Aqmola Province	2,000,000
Do.	PK Cement Plant Semey LLP (Saikan Co.)	Plant in Abay Province	1,200,000
Do.	Rudny Cement plant LLP	Plant in Qostanay Province	500,000
Do.	SAS-Tobe Technologies LLP (Sastobe Cement)	Plant in Turkistan Province	500,000
Do.	Standard Cement LLP	do.	1,000,000
Do.	Zharma cement plant LLP [Sharcem LLP (International Cement Group, 60%, and Kazakh Invest, 40%)	Plant in Abay Province	1,200,000
Chromite:			
Marketable ore	JSC TNK Kazchrome [Eurasian Resources Group LLP (ERG), private, 60%, and Government, 40%]	10-years of Independence of Kazakhstan, Dubersay, Geologicheskiy, Geofizicheskoye IX, Geofizicheskoye-XI, Iyunskoye, and Molodyezhnaya Mines in Donskoy GOK,[4] Khromtau, Aqtobe Province	4,800,000
Do.	Oriel Resources Ltd. (Yildirim Holding)	Voskhod Mine and plant in Voskhod GOK,[4] Khromtau, Aqtobe Province	1,300,000
Concentrate	JSC TNK Kazchrome [Eurasian Resources Group LLP (ERG), private, 60%, and Government, 40%]	Plant in Donskoy GOK,[4] Khromtau, Aqtobe Province	3,400,000
Coal	Bogatyr' Komir LLP	Ekibastuz coal basin, Pavlodar Province	42,000
Do.	JSC ArcelorMittal Temirtau (Kazakhstan Investment Corp., 100%)	8 mines, in Qaraghandy coal basin, in and around Qaraghandy Province	7,000,000
Do.	JSC EEC [Eurasian Resource Group LLP (ERG), private, 60%, and Government, 40%]	Vostochniy Mine, Qaraghandy Province	20,000
Do.	JSC Karazhyra	Karazhyra Mine, Abay Province	8,000
Do.	JSC Shubarkol Komir [Eurasian Resource Group LLP (ERG), private, 60%, and Government, 40%]	Mine in Qaraghandy Province	8,000
Copper:			
Ore, recoverable, Cu content	Aktyubinskaya Mednaya Kompaniya LLP (AMK) [Russian Copper Co. (RMK)]	Vesenne-Aralchinskoye Mine, Aqtobe Province	4,500
Do.	Balkhashtsvetmet PA (Kazakhmys Corp. LLP)	Kounrad Mine, Qaraghandy Province	5,000
Do.	do.	Sayak Mine, Qaraghandy Province	5,000
Do.	do.	Shartykul Mine, Zhambyl Province	21,000
Do.	Copper Technology LLP {Aktyubinskaya Mednaya Kompaniya LLP (AMK) [Russian Copper Co. (RMK)]}	50th Anniversary of October Mine, Koktau, Aqtobe Province[7]	55,000
Do.	do.	Priorskoye Mine, Aqtobe Province	8,000
Do.	Karagandatsvetmet PA (Kazakhmys Corp. LLP)	Abyz Mine, Qaraghandy Province	9,000
Do.	do.	Kusmuryn-Aktabasu Mine, Abay Province	6,000
Do.	do.	Nurkazgan (Samarskoye) Mine, Qaraghandy Province	28,000
Do.	do.	Khadzhikongan Mine, Qaraghandy Province	3,000
Do.	Kazgeorud LLP {Aktyubinskaya Mednaya Kompaniya LLP (AMK) [Russian Copper Co. (RMK)]}	Kundyzdy Mine, Aqtobe Province	11,300
Do.	KAZ Minerals Ltd. (Nova Resources BV, 100%)	Aktogay Mine, Abay Province	203,000
Do.	do.	Bozshakol Mine, Pavlodar Province	102,000
Do.	do.	East Region complex, Shyghys Qazaqstan Province: Artemyevskiy, Irtyshskiy, and Orlovsky Mines	44,000
Do.	do.	Belousovsky Mine and plant, in Belousovsky GOK[8]	2,700
Do.	do.	Yubileyno-Snegirikhinsky Mine[9]	22,000
Do.	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Ridder GOK,[4] Shyghys Qazaqstan Province:	

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Copper:—Continued			
Ore, recoverable, Cu content—Continued	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Ridder-Sokolny Mine[10]	NA
Do.	do.	Shubinsky Mine[11]	2,800
Do.	do.	Tishinsky Mine	15,000
Do.	do.	Maleevsky Mine in Altai GOK,[4] Shyghys Qazaqstan Province	40,000
Do.	Polymetal International plc, 100%	Varvara and Kamar Mines in Varvara Hub, Qostanay Province	17,000
Do.	SN Mining LLP	Severo-Nikolaevsky Mine	26,000
Do.	Zhezkazgantsvetmet PA (Kazakhmys Corp. LLP)	East Zhezkazgan Mine, Ulytau Province[12]	77,000
Do.	do.	North Zhezkazgan Mine, Ulytau Province	15,000
Do.	do.	South Zhezkazgan Mine, Ulytau Province	79,000
Do.	do.	Zhilandinsky Mine, Ulytau Province	26,000
Do.	do.	Zhomart Mine, Ulytau Province	68,000
Concentrate, Cu content	Aktyubinskaya Mednaya Kompaniya LLP (AMK) [Russian Copper Co. (RMK)]	Two concentrators, Aqtobe Province	9,000
Do.	Balkhashtsvetmet PA (Kazakhmys Corp. LLP)	Balkhash concentrator, Qaraghandy Province	40,000
Do.	JAS BAST	Maksut concentrator, Abay Province	NA
Do.	Karagandatsvetmet PA (Kazakhmys Corp. LLP)	Karagaily concentrator in Qaraghandy Region complex, Qaraghandy Province	10,000
Do.	do.	Nurzkazgan concentrating mill, Qaraghandy Province	33,000
Do.	KAZ Minerals Ltd. (Nova Resources BV, 100%)	East Region complex, Shyghys Qazaqstan Province: Nikolayevsky and Orlovsky concentrators	46,000
Do.	do.	Aktogay concentrator, Abay Province	213,000
Do.	do.	Bozshakol concetrator for kaolinized ore processing, Pavlodar Province	102,000
Do.	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Altai concentrator in Altai GOK,[4] Shyghys Qazaqstan Province	10,000
Do.	do.	Ridder concentrator in Ridder GOK,[4] Shyghys Qazaqstan Province	10,000
Do.	Polymetal International plc, 100%	Concentrator at Varvara hub, Qostanay Province	NA
Do.	Zhezkazgantsvetmet PA (Kazakhmys Corp. LLP)	Zhezkazgan concentrators No. 1, No. 2, and No. 3,[13] Ulytau Province	21,200
Metal	Balkhashtsvetmet PA (Kazakhmys Smelting LLP)	Balkhash copper smelting and refinery plant, Qaraghandy Province	220,000
Do.	do.	Zhezkazgan copper smelting and refinery plant, Ulytau Province	200,000
Do.	Central Asia Metals plc	Smelter and refinery in Kounrad, Qaraghandy Province	14,000
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)]	Smelter and refinery in Oskemen (also known as Ust-Kamenogorsk), Shyghys Qazaqstan Province	19,000
Ferroalloys:			
Ferrochrome:			
High-, medium-, and low-carbon FeCr containing 69% Cr	JSC TNK Kazchrome [Eurasian Resources Group LLP (ERG), private, 60%, and Government, 40%]	Aktobe plant in Aqtobe Province	480,000
High-carbon FeCr containing 69% Cr	do.	Aksu plant in Pavlodar Province	700,000
Unspecified	do.	Plant in Aqtobe Province	NA
Ferromanganese	JSC Temirtau Electrometallurgical Complex (JSC TEMC)	Plant in Qaraghandy Province	30,000

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Ferroalloys:—Continued				
Ferrosilicon		JSC Temirtau Electrometallurgical Complex (JSC TEMC)	Plant in Qaraghandy Province	NA
Do.		YDD Corp. LLP	do.	180,000
Ferrosilicochromium		JSC TNK Kazchrome [Eurasian Resources Group LLP (ERG), private, 60%, and Government, 40%]	Plant in Aqtobe Province	NA
Ferrosilicomanganese		JSC Temirtau Electrometallurgical Complex (JSC TEMC)	Plant in Qaraghandy Province	449,000
Silicomanganese		JSC TNK Kazchrome [Eurasian Resources Group LLP (ERG), private, 60%, and Government, 40%]	Plant in Aqtobe Province	NA
Do.		Qaz Carbon LLP	Sary-Arka ferroalloy plant, Qaraghandy Province	8,800
Do.		Taraz Metallurgical Plant LLP[14]	Taraz metallurgical plant, Zhambyl Province	2,000
Gold:				
Mine production, Au content	kilograms	JSC AK Altynalmas (Gouden Reserves B.V., 59.97%, and other private owners, 40.03%)	Akbakay Mine, Zhambyl Province	3,300
Do.	do.	JSC AK Altynalmas (Gouden Reserves B.V., 59.97%, and other private owners, 40.03%)	Pustynnoye and Dolinnoye project, Qaraghandy Province	5,700
Do.	do.	JSC Altyntau-Kokshetau [Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)]	Vasil'kovskoe Mine in Aqmola Province	15,000
Do.		JSC FIK Alel (Nord Gold N.V.)	Suzdal Mine, Abay Province	NA
Do.	kilograms	JSC GMK Kazakhaltyn (JSC AK Altynalmas, 54.24%; Financial Services B.V., 25%; and private investors, 20.76%)	Aksu Mine, Aqmola Porvince	770
Do.	do.	do.	Bestobe project, Aqmola Province	1,400
Do.	do.	do.	Zholymbet project, Aqmola Province	1,500
Do.		JSC Maykainzoloto	Maykain B and Alpys Mines, Pavlodar Province	NA
Do.		Kazakhmys Holding Group LLP (Kazakhmys Corp. LLP)	Mines in Abay, Qaraghandy, Ulytau, and Zhambyl Provinces	NA
Do.		KAZ Minerals Ltd. (Nova Resources BV, 100%)	Aktogay Mine, Shyghys Qazaqstan Province	NA
Do.		do.	Bozshakol Mine, Pavlodar Province	NA
Do.	kilograms	Polymetal International plc, 100%	Varvara and Komar Mines in Varvara hub, Qostanay Province	6,600
Do.	do.	do.	Bakyrchik Mine in Kyzyl project, Shyghys Qazaqstan Province	10,300
Do.		Polyus Gold International Ltd.[15]	Mine in Soltustik Qazaqstan Province	NA
Do.	kilograms	RG Gold LLP	North and South Raygorodok Mines, Aqmola Province	4,500
Do.		Yubileynoye LLP	Mine in Aqtobe Province	NA
Concentrate, Au content	kilograms	KAZ Minerals Ltd. (Nova Resources BV, 100%)	Bozshakol Mine, Pavlodar Province	3,700
Dore and gold-containing products	do.	JSC AK Altynalmas (Gouden Reserves B.V., 59.97%, and other private owners, 40.03%)	Akbakay Mine, Zhambyl Province	1,900
Do.	do.	do.	Aksu-2 project, Aqmola Porvince	2,000
Do.	do.	do.	Aksu KG project, Aqmola Province	590
Do.	do.	do.	Bestobe project, Aqmola Province	960
Do.	do.	do.	Maykain concentrator, Pavlodar Province	
Do.	do.	do.	Pustynnoye project, Qaraghandy Province	5,200
Do.	do.	do.	Zholymbet project, Aqmola Province	710
Refined	do.	Kazakhmys Smelting LLP	Refinery in Qaraghandy Province	11,000
Do.	do.	Tau-Ken Altyn LLP (JSC NGK Tau-Ken Samruk, 100%)	Refinery, Special economic zone, Aqmola Province	25,000
Do.	do.	Ust-Kamenogorsk metallurgical complex [Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)]	Refinery in Oskemen (also known as Ust-Kamenogorsk), Shyghys Qazaqstan Province	8,000
Gypsum		JSC Jambylgypsum (Sen-Goben Co.)	Mine in Zhambyl Province	270,000

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Indium	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Lead plant, Ust-Kamenogorsk metallurgical complex, Shyghys Qazaqstan Province	1
Iron and manganese from tailings	Global Mining Technology LLP	Tailings No. 1 and No. 2 from West Karazhal, Ulytau Province	53,000
Iron ore, marketable, gross weight	JSC Sokolov-Sarbai Mining Production Association [Eurasian Natural Resources Corp. plc (ENRC)]	Four open pit mines and one underground mine in Qostanay Province	40,000,000
Do.	Orken LLP (ArcelorMittal Temirtau, 100%)	Lisavosk Mine in Qostanay Province, Kentobe and Atasu Mines in Qaraghandy Province, and Atansor Mine in Aqmola Province	4,500,000
Iron and steel:			
Pig iron thousand metric tons	JSC ArcelorMittal Temirtau (Kazakhstan Investment Corp., 100%)	Temirtau, Qaraghandy Province	5,700
Steel:			
Raw do.	do.	do.	3,400
Products, rolled do.	do.	Termirtau and Aktau, Aktau and Mangghystau Provinces	2,700
Lead:			
Mine production, recoverable Pb content of ore	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Ridder GOK,[4] Shyghys Qazaqstan Province: Dolinny Mine	NA
Do.	do.	Tishinsky Mine	15,000
Do.	do.	Shubinsky Mine[11]	630
Lead:—Continued			
Mine production, recoverable Pb content of ore:—Continued	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Zhairem Mine in Zhairem GOK,[4] Ulytau Province	71,000
Do.	do.	Maleevsky Mine in Altay GOK,[4] Shyghys Qazaqstan Province	26,000
Concentrate, Pb content	do.	Ridder GOK,[4] Shyghys Qazaqstan Province: Ridder concentrator	NA
Do.	do.	Altay concentrator in Altay GOK,[4] Shyghys Qazaqstan Province	NA
Do.	do.	Zhairem concentrator in Zhairem GOK,[4] Ulytau Province	NA
Lead dust	Balkhashtsvetmet PA (Kazakhmys Smelting LLP)	Balkhash copper smelting and refinery plant, Qaraghandy Province	10,000
Do.	do.	Jezkagan copper smelting and refinery plant, Ulytau Province	9,000
Metal	JSC PC Yuzhpolimetall[5]	Shymkent metallurgical plant, Turkistan Province[6]	NA
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc LLP (Glencore plc, 69.70% and Tau-Ken Samruk NMC JSC, 29.82%)]	Lead plant in Oskemen (also known as Ust-Kamenogorsk), Shyghys Qazaqstan Province	110,000
Lime	JSC Temirtau Electrometallurgical Complex (JSC TEMC)	Plant in Qaraghandy Province	NA
Do.	Kazchimtecsnab LLP	Chemical plant in Abay Province	NA
Do.	Maykain Lime Plant LLP	Plant in Pavlodar Province	120,000
Do.	Neohim LLP	Plant in Aqtobe Province	NA
Do.	Premium Class-Story LLP	Plant in Qyzylorda Province	75,000
Do.	SAS-Tobe Technologies LLP (Sastobe Cement)	Plant in Turkistan Province	NA
Do.	TOO SH WORK	Plant in Almaty Province	NA
Do.	TOO Tulkubas Lime Plant	Plant in Turkistan Province	NA
Limestone thousand metric tons	JSC Aluminium of Kazakhstan [Eurasian Resources Group LLP (ERG), Government, 40%, and private, 60%]	Keregetas Mine, Pavlodar Province	2,000
Do.	JSC Temirtau Electrometallurgical Complex (JSC TEMC)	South-Toparskoye ore management, Qaraghandy Province[16]	NA

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Magnesium, metal	JSC Ust-Kamenogorsk titanium-magnesium plant (UKTMK)	Workshop # 1 at Oskemen (also known as Ust-Kamenogorsk), Shyghys Qazaqstan Province	NA
Manganese:			
Crude ore, Mn content	Aramn-100 LLP	Western Kamys Mine, Zhana-Arkinskiy Region, Ulytau Province[17]	320,000
Do.	JSC Marganets Zhayrema [JSC Zhayremskiy GOK,[4] 100%, (Kazzinc LLP)]	Perstnevka, Ushkatyn II and Ushkatyn III, Zhomart,[18] Zapadny Zhomart Mines, Ulytau Province	330,000
Do.	Kazmarganets Mining Enterprise {JSC TNK Kazchrome [Eurasian Resources Group LLP (ERG)]}	Tur Mine, Qaraghandy Province	300,000
	LLP ORKEN [JSC Zhayremskiy GOK,[4] 100%, (Kazzinc LLP)]	Western Karazhal, Atasuiskiy ore region, Ulytau Province	790,000
Do.	Zhana Arka Manganese LLP	Eastern Kamys Mine, Zhana-Arkinskiy Region, Ulytau Province	320,000
Concentrate	JSC Temirtau Electrometallurgical Complex (JSC TEMC)	Bogach mine, Qaraghandy Province	NA
Minor metals (indium, selenium, tellurium, thallium, and so forth)	LLP Belogorskiy GOK[4, 19]	Belogorskiy rare-metals plant, Shyghys Qazaqstan Province	NA
Do.	JSC PC Yuzhpolimetall[5]	Shymkent metallurgical plant, Turkistan Province[6]	NA
Molybdenum (in ferromolybdenum)	Balausa Firm LLP (Ferro-Alloys Resources Ltd., 100%)	Balasausqandyq processing plant, Turkistan Province	36
Concentrate, Mo content	KAZ Minerals Ltd. (Nova Resources BV, 100%)	Aktogay Mine, Abay Province	2,000
Natural gas nillion cubic meters	Companies: Karachaganak Petroleum Operating B.V. (BG Group plc., 29.25%; ENI S.p.A., 29.25%; Chevron Corp., 18%; JSC Lukoil, 13.5%; JSC NK KazMunaiGas, 10%)	Locations: Facilities in Karachaganak onshore field, Batys Qazaqstan Province	58,000 [20]
Do.	Tengizchevroil (Chevron Corp., 50%; ExxonMobil Kazakhstan Inc., 25%; JSC KN KazMunaiGas, 20%; LukArco B.V., 5%)	Tengiz project (Tengiz and Korolev onshore fields), Atyrau Province	NA
Do.	Additional production at smaller fields	NA	NA
Nickel:			
Concentrate	Balausa Firm LLP (Ferro-Alloy Resources Ltd., 100%)	Balasausqandyq processing plant, Turkistan Province	60
Niobium, metal, niobium products, Nb content	JSC NAC Kazatomprom	Ulba metallurgical plant, Oskemen (also know as Ust-Kamenogorsk), Shyghys Qazaqstan Province	30
Nitrogen, ammonia, N content	JSC KazAzot	Aktau, Mangghystau Province	300,000
Petroleum:			
Crude thousand 42-gallon barrels	China Petroleum and Chemical Corp. (Sinopec), PetroChina Co. Ltd., and China National Petroleum Corp.	North Buzachi onshore oilfield, Atyrau Province	51,000
Do. do.	CNPC-AktobeMunaiGas JSC (China National Petroleum Corp., 85.42%)	Kenkiyak (sub-salt), Kenkiyak (post-salt), and Zhanazhol onshore fields, Aqtobe Province	205,000
Do. do.	JSC Embamunaigas, JSC Kazakhtukmunay, JSC Kazakhoil Aktobe, JSC Karazhanbasmunai, JSC Mangistaumunaigaz, JSC Kazgermunai, JSC Ozenmunaigas, JSC Petrokazakhstan Kumkol Resources, JSC Turgai Petroleum (JSC NK KazMunaiGas, 100%)	Onshore oilfields in Mangghystau Province, in Atyrau Province, Aqtobe Province, and Qyzylorda Province	161,000
Do. do.	Karachaganak Petroleum Operating B.V. (BG Group plc., 29.25%; ENI S.p.A., 29.25%; Chevron Corp., 18%; JSC Lukoil, 13.5%; JSC NK KazMunaiGas, 10%)	Karachaganak onshore field, Batys Qazaqstan Province	82,000

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Petroleum:				
Crude	thousand 42-gallon barrels	North Caspian Operating Co. (NCOC) (ENI S.p.A., 16.88%; JSC NK KazMunaiGas, 16.81%; Royal Dutch Shell, 16.81%; Total S.A., 16.81%; ExxoMobil, 16.81%; China National Petroleum Corp., 8.33%; Inpex, 7.56%)	Aktoty, Kairan, and Kashagan offshore fields, Atyrau Province	130,000
Do.	do.	PetroKazakhstan Inc. (China National Petroleum Corp., 67%, and JSC NK KazMunaiGas, 33%)	South Turgai basin onshore, Qostanay Province	42,000
Do.	do.	Tengizchevroil LLP (Chevron Corp., 50%; ExxoMobil Kazakhstan Inc., 25%; JSC NK KazMunaiGas, 20%; PJSC Lukoil Oil Co., 5%)	Tengiz project (Tengiz and Korolev fields), Atyrau Province	214,000
Refined, crude petroleum throughput	thousand 42-gallon barrels	Atyrau Oil Refinery Plant LLP (JSC NK KazMunaiGas, 99.53%)	Atyrau refinery in Atyrau Province	33,000,000
Do.	do.	JSC Pavlodar Oil Chemistry Refinery (JSC NK KazMunaiGas, 58%)	Pavlodar refinery in Pavlodar Province	34,000,000
Do.	do.	PetroKazakhstan Oil Products LLP (China National Petroleum Corp., 50%, and JSC NK KazMunaiGas, 50%)	Shymket refinery in Turkistan Province	20,000,000
Do.	do.	Caspi Bitum SP LLP (JSC NK KazMunaiGas, 50%)	Refinery in Aktau, Mangghystau Province	2,900,000
Phosphate rock, beneficiated		Kazphosphate LLC	Aksai, Shiilibulak, and Sholaktau mines and plant, Chulaktau mining and processing complex, Zhambyl Province	NA
Do.		do.	Kok-su, Kok-john, and Zhanatas Mines and plant, Kazphosphate mining and processing complex, Zhambyl Province	NA
Do.		Temir Service LLP (Sunkar Resources plc)	Chilisai deposit, Aqtobe Province	NA
Rare earth elements, from uranium ore residue		ATEK LLC, 100%	Plant in Stepnogorsk, Aqmola Province	1,500
Rhenium:				
Ammonium perrhenate (containing 69.2% Re)		RSE Zhezkazganredmet (Government)	Workshop for processing and extraction of rare metals, on Zhezkazgan copper smelter territory, Ultau Province	NA
In tailings from copper ore processing		Kazakhmys Smelting LLP	PO Balkhashtsvetmet, Qaraghandy Province	NA
Salt		Inder Tuz Co. LLP	Inder Lake, Atyrau Province	50,000
Do.		JSC Araltuz	Zhaksykylysh Mine, Qyzylorda Province	600,000
Do.		do.	Mine in Zhambyl Province	50,000
Do.		Pavlodar LLP	Bol'shoi Kalkaman Lake, Bol'shoi Tavolzhan Lake, and Tyzdysor Lake in Pavlodar Province	100,000
Selenium		Balkhashtsvetmet PA (Kazakhmys Corp. LLP)	Kounrad Mine, Qaraghandy Province	60
Silicon, metal		Silicium Kazakhstan LLP [Tau-Ken Temir LLP (JSC NGK Tau-Ken Samruk, 100%)]	Plant in Qaraghandy Province	20,000
Silver:				
Mined, concentrate, Ag content	kilograms	Altay Polymetalls LLP	Koktaszhal Mine, Qaraghandy Province	35,000
Do.	do.	KAZ Minerals Ltd. (Nova Resources BV, 100%)	Aktogay Mine, Abay Province	32,000
Do.	do.	do.	Bozshakol Mine, Pavlodar Province	23,000
Do.	do.	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Zhairem Mine in Zhairem GOK,[4] Ulytau Province	41,000
Do.	do.	do.	Maleevsky Mine, Altai complex, Shyghys Qazaqstan Province	32,000
Do.	do.	Zhezkazgantsvetmet PA (Kazakhmys Corp. LLP)	East Zhezkazgan, North Zhezkazagan, and South Zhezkazgan Mines, Ulytau Province	290,000
Refined		JSC PC Yuzhpolimetall[5]	Shymkent metallurgical plant, Turkistan Province[6]	NA
Do.		Kazakhmys Smelitng LLP	Balkhash copper smelting plant, Qaraghandy Province	NA

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Silver:—Continued			
Refined—Continued	Tau-Ken Altyn LLP (JSC NGK Tau-Ken Samruk, 100%)	Refinery, Special economic zone, Aqmola Province	7,000
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)]	Refinery at Oskemen (also known as Ust-Kamenogorsk), Shyghys Qazaqstan Province	NA
Sulfur	Tengizchevroil LLP (Chevron Corp., 50%; ExxonMobil Kazakhstan Inc., 25%; JSC NK KazMunaiGas JSC, 20%; LukArco B.V., 5%)	Tengiz project (Tengiz and Korolev fields), Atyrau Province	1,100,000
Sulfuric acid ıousand metric tons	Kazakhmys Smelitng LLP	Balkhash copper smelting and refinery plant, Qaraghandy Province	1,100
Do.	do.	Zhezkazgan copper smelting and refinery plant, Ulytau Province	260,000
Do.	Kazphosphate LLC	Plant in Taraz, Zhambyl Province	NA
Do.	Kazzinc LLP (Glencore plc, 69.70% and Tau-Ken Samruk NMC JSC, 29.82%)	Shyghys Qazaqstan Province	NA
Do.	SKSK LLP (JSC NAC Kazatomprom)	Stepnogorsk, Aqmola Province	180,000
Do.	SKZ-U LLP (JSC NAC Kazatomprom)	Kyzylorda, Qyzylorda Province	NA
Tantalum, metal, Ta content	JSC NAC Kazatomprom	Ulba Metallurgical Plant, Oskemen (also know as Ust-Kamenogorsk), Shyghys Qazaqstan Province	NA
Titanium:			
Do.	Expoengineering LLP	Shokash GOK,[4] Aqtobe Province	120,000 zirconium
Ore	Satpayevsky Mining and Processing Enterprise LLP (Ust-Kamenogorsk titanium-magnesium plant, 49%)	Satpayevskoye (Bektemir) Mine, Shyghys Qazaqstan Province	210,000 ilmenite
Do.	Tioline LLP	Obuhovskoye GOK, just north of Kokshetau, Soltustik Qazaqstan Province	200,000 zirconium
Metal (sponge)	JSC Ust-Kamenogorsk titanium-magnesium plant (UKTMK)	Plant at Oskemen (also known as Ust-Kamenogorsk), Shyghys Qazaqstan Province	15,000
Thallium	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Lead plant, Ust-Kamenogorsk metallurgical complex, Shyghys Qazaqstan Province	6
Uranium, U content	Companies:	Locations:	24,000 [20]
	Akbastau JV (JSC NAC Kazatomprom, 50%, and Uranium One Inc., 50%)	Blocks 1, 3, and 4 of the Budenovskoe deposit, Sozak Region, Turkistan Province	
	APPAK LLP (JSC NAC Kazatomprom, 65%; Sumitomo Corp., 25%; Kansai Electric Power Co. Inc., 10%)	West site of Mynkuduk deposit, Sozak Region, Turkistan Province	
	Baiken-U LLP [JSC NAC Kazatomprom, 52.5%, and Energy Asia (BVI) Ltd., 47.5%]	Kharasan-2 and southern flank of North Kharassan deposit, Qyzylorda Province	
	JV Akbastau JSC (JSC NAC Kazatomprom, 50%, and One Group JSC, 50%)	Blocks 1, 3, and 4 of Budeonovskoe deposit, Turkistan Province	
	JV Budyonovskoye LLP (JSC NAC Kazatomprom, 50%, and UraniumOne Inc., 50%)	Blocks No. 6 and 7 of the Budenovskoe deposit, Sozak Region, Turkistan Province	
	JV Inkai LLP (JSC NAC Kazatomprom, 60%, and Cameco Corp., 40%)	Blocks 1, 2, and 3 of the Inkai deposit, Sozak Region, Turkistan Province	
	JV Katco LLP (JSC ORANO Mining, 51%, and JSC NAC Kazatomprom, 49%)	Block No. 2 (Tortkuduk) of the Moinkum deposit and Block No. 1 (South) of the Moinkum deposit, Sozak Region, Turkistan Province	
	JV Khorasan-U LLP (JSC NAC Kazatomprom, 50%; Uranium One Utercht B.V., 30%; and Energy Asia Holding Ltd., 20%)	Khorasan-1 area of the Northern Khorasan, deposit, Zhanakorgan Region, Qyzylorda Province	
	JV SMCC LLP (Uranium One Rotterdam B.V., 70%, and JSC NAC Kazatomprom, 30%)	Akdala Mine and Site No. 4 of the Inkai deposit, Sozak Region, Turkistan Province	

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Uranium, U content:—Continued	Karatau LLP (JSC NAC Kazatomprom, 50%, and Uranium One Netherlands B.V. PLLC, 50%)	Block 2 of the Budenovkoe deposit, Turkistan Province	
	Kazatomprom-SaUran LLP (JSC NAC Kazatomprom, 100%)	Kanzhugan, Central Moyynkum, South Moyynkum Unavas, and Mynkuduk Mines, Sozak Region, Turkistan Province	
	Kyzylkum LLP (JSC NAC Kazatomprom, 50%; Japanese consortium, 30%; UraniumOne Inc., 20%)	Khorasan-1 area of the Northern Khorasan deposit, Mine, Qyzylorda Province	
	ME ORTALYK LLP (JSC NAC Kazatomprom, 51%, and CGNM UK Ltd., 49%)	Central site of Mynkuduk deposit, Turkistan Province	
	RU-6 LLP (JSC NAC Kazatomprom, 100%)	North and South Karamurun deposit, Qyzylorda Province	
	Semizbai-U LLP (JSC NAC Kazatomprom, 51%, and Beijing Sino-Kazakh Uranium Resources Investment Co. Ltd., 49%)	Irkol Mine in Qyzylorda Province and Semizbai Mine on the border of Soltustik Qazaqstan and Aqmola Province	
	Zarechnoye JSC KRK JV (JSC NAC Kazatomprom, 49.98%, and JSC Atomredmetzoloto, 49.67%)	Zarechnoye and South Zarechnoye deposits, Olrarski Region, Turkistan Province	
Vanadium:			
Ore	Balausa Firm LLP (Ferro-Alloys Resources Ltd., 100%)	Balasausqandyq processing plant, Turkistan Province	15,000
Pentoxide	do.	do.	306
Zinc:			
Ore, Zn content	Altyn LLP (Kazzinc LLP)	Shaimerden Mine[17], Qostanay Province	NA
Do.	Copper Technology LLP (Russian Copper Co.)	Priorskoye Mine, Aqtobe Province	59,000
Do.	do.	50 let Oktyabrya Mine, Aqtobe Province	39,000
Do.	do.	Kundyzdy Mine, Aqtobe Province	24,000
Do.	Karagandatsvetmet PA (Kazakhmys Corp. LLP)	Abyz Mine, Qaraghandy Province	14,000
Do.	KAZ Minerals Ltd. (Nova Resources BV, 100%)	East Region complex, Shyghys Qazaqstan Province: Artemyevsky Mine	29,000
Do.	do.	Belousovsky Mine[8]	NA
Do.	do.	Irtyshsky Mine	7,000
Do.	do.	Orlovsky Mine	23,000
Do.	do.	Yubileyno-Snegirikhinsky Mine[9]	17,000
Do.	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Ridder GOK,[4] Shyghys Qazaqstan Province: Ridder-Sokolny Mine[10]	NA
Do.	do.	Shubinsky Mine[11]	4,000
Do.	do.	Tishinsky Mine	65,000
Do.	do.	Maleevsky Mine in Altay GOK,[4] Shyghys Qazaqstan Province	33,000
Do.	do.	Zhairem Mine in Zhairem GOK,[4] Ulytau Province	71,000
Do.	Nova Zinc LLP (OJSC Chelyabinsk Zinc Plant)	Akzhal Mine, Qaraghandy Province	50,000
Do.			
Do.	SN Mining LLP	Severo-Nikolaevsky Mine, Shyghys Qazaqstan Province	20,000
Concentrate, Zn content	Karagandatsvetmet PA (Kazakhmys Corp. LLP)	Karagaily concentrator in Qaraghandy Region complex, Qaraghandy Province	8,000
Do.	KAZ Minerals Ltd. (Nova Resources BV, 100%)	East Region complex, Shyghys Qazaqstan Province: Belousovsky concentrator[8]	6,000
Do.	do.	Nikolaevsky concentrator	36,000
Do.	do.	Orlovsky concentrator	60,000
Do.	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Ridder concentrator in Ridder GOK,[4] Shyghys Qazaqstan Province	NA

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2022[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Zinc:—Continued			
Concentrate, Zn content—Continued	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Zhairem concentrator in Zhairem GOK,[4] Ulytau Province	NA
Do.	do.	Altay concentrator in Altay GOK,[4] Shyghys Qazaqstan Province	NA
Do.	Nova Zinc LLP (JSC Chelyabinsk Zinc Plant)	Akzhal concentrator, Qaraghandy Province	35,000
Metal	Kazzinc LLP (Glencore plc, 69.70%, and Tau-Ken Samruk NMC JSC, 29.82%)	Ridder zinc refinery in Ridder GOK,[4] Shyghys Qazaqstan Province	120,000
Do.	do.	Ust-Kamenogorsk metallurgical complex, Shyghys Qazaqstan Province	140,000

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

[1]Many 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.

[2]The complex closed in 2022 due to the depletion of reserves.

[3]The deposit was mothballed since 2008. No further information was available.

[4]GOK is the abbreviation for gorno-obogatitelnyi kombinat, which translates as "mining and beneficiation complex."

[5]The company announced bankruptcy in 2018. No further information was available.

[6]Operations at the plant were stopped in 2022 owing to an ownership dispute.

[7]The open pit mine was closed in 2019 and remained closed through 2022.

[8]The mine was closed in 2018 owing to the depletion of reserves.

[9]The mine was closed in 2017 owing to the depletion of reserves.

[10]The mine was under liquidation.

[11]The mine was liquidated in 2020.

[12]The mine was closed in 2013 because it was unprofitable to mine.

[13]The Zhezkazgan concentrating plant No. 3 has not operated since 2013 and remained closed through 2022.

[14]The company went bankrupt and the plant was put up for auction.

[15]The contract was annulled in 2010. No further information was available.

[16]The mine was completely closed in 2020. No further information was available.

[17]The mine was liquidated in 2020.

[18]The mine was mothballed in 2022. It was expected to resume operations in 2024.

[19]The production of rare metals was mothballed at this facility and liquidated.

[20]Capacity estimates are totals for all enterprises that produced that commodity.