USGS
science for a changing world

2007 Minerals Yearbook

MONGOLIA [ADVANCE RELEASE]

U.S. Department of the Interior
U.S. Geological Survey

February 2009

The Mineral Industry of Mongolia

By Pui-Kwan Tse

Mongolia's mineral resources were largely unexplored and unexploited. About 80 types of minerals were discovered in Mongolia, of which the most valuable were coal, copper, fluorspar, gold, iron, lead, molybdenum, silver, tungsten, uranium, and zinc. Mongolia's production of fluorspar ranked third in the world behind China and Mexico; however, coal and copper could provide major contributions to the country's economic growth in the next decade. The development of the Oyu Tolgoi copper deposit and the Tavan Tolgoi coal deposit could lead Mongolia to become a significant supplier to the Asia and the Pacific region, where the demand for these commodities in such countries and regions as China, Japan, India, the Republic of Korea, and Taiwan was expected to grow in the future.

Minerals in the National Economy

Since 2000, mining has been a major and increasing contributor to Mongolia's economy. In 2007, the mining and quarrying sector accounted for 33% of the country's gross domestic product; the value of the sector's output accounted for 70.3% of the total value of industrial output. Mineral exploration was hampered by limited infrastructure, such as a shortage of roads and water resources, and severe weather in Mongolia. During the past several years, however, economic and governmental reforms have led to increased foreign investment in mineral exploration and exploitation in the country. Mining and oil exploration accounted for 68% of total foreign direct investment in 2005. The boom of foreign investment in the exploration sector had resulted in the discovery of several large deposits, such as Baruun Naran (coal), Ovoot Tolgoi (coal), Tavan Tolgoi (coal), Oyu Tolgoi (copper and gold), Tsagaan Suvarga (copper and molybdenum), Gatsuurt (gold), Golden Hills (gold), Tumurtei (iron), and Ulaan (lead and zinc). If these deposits receive the approval from the Government and are successfully put into operation, the output of the mining sector could increase substantially during the next several years. The total labor force of the industrial sector increased to 54,261 in 2007 from 53,600 in 2006, but employment in the mining and quarrying sector decreased to 15,235 in 2007 from 16,167 in 2006. Employment data, however, did not include about 70,000 people engaged in artisanal and small-scale mining in Mongolia (Mineral Resources and Petroleum Authority of Mongolia, 2008).

Government Polices and Programs

The Government planned to develop a private sector development strategy, which aimed to accelerate economic growth through the private sector. Mining was considered to be a lead industry for private development. Large-scale mining could be environmentally and socially sustainable into the future. The Parliament planned to amend the minerals law again, which was amended in 2006. The current minerals law provided for exploration and mining activity under a special permission issued by the Mineral Resources and Petroleum Authority. The Mongolia Constitution states that mineral resources under the ground are the property of the people of Mongolia. The mineral resources can be mined by the Mongolian people without payment, or can be sold to a foreign investor. Some members of the Parliament took the position that the current minerals law did not protect the interests of Mongolian people, especially with respect to strategic deposits. They argued that the share of Government equity should be higher for such strategic deposits as Oyu Tolgoi and Tavan Tolgoi and that foreign investors should not be allowed to hold more than 49% of the equity in a company that is developing a strategic deposit. The Government established a holding company, Erdenes MGL LLC, to oversee the Government's equity. The Government planned to list Erdenes on the Mongolian Stock Exchange to allow individual Mongolians to acquire shares in Erdenes (Triple C LLC Bulletin, 2008a).

The Mongolian Parliament was considering the Government's proposal to amend the oil products law. The current law prohibited any company that supplied more than 30% of wholesale petroleum products to the Mongolian market from entering the retail market. The changes would benefit the Rosneft oil company of Russia, which supplied more than 30% of petroleum products to Mongolia. During the past 2 years, the price of petroleum and petroleum products had increased sharply and the Mongolian Government subsidized the increase of petroleum price to domestic importers to avoid significant price fluctuations in the domestic market. The Parliament, however, feared that the changes would create a monopoly supplier and retailer and would drive out local retailers. The Government stated that the cap of 10% on the retail market would not harm domestic petroleum importers (Triple C LLC Bulletin, 2008b).

Production

Mongolia's major important minerals production included coal, copper, fluorspar, gold, molybdenum, and zinc. Production of cement, coal, iron ore, molybdenum, petroleum, steel, and tungsten increased compared with production in 2006. Production of cement, coal, and steel was mostly for domestic consumption by the construction and the utility industries. Since the introduction of a windfall profits tax on copper and gold production in 2006, officially recorded gold production and sales of gold to the Bank of Mongolia decreased.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2007, Mongolia's total trade increased by 32.3% to $4.01 billion. Owing to high global metal market prices, the value of exports increased by 22.5% to $1.89 billion. Owing to increased demand for agricultural products and mineral fuels, the value of imports increased by 42.5% to $2.12 billion. The value of metal and mineral exports accounted for about 68.9% of the country's total export value. Mongolia exported nearly all its output of copper concentrates to China; molybdenum concentrates to, in descending order of amount shipped, the Republic of Korea, China, Japan, and the Netherlands; and fluorspar to, in descending order of amount shipped, Russia, the United States, Ukraine, and China. Gold was exported mainly to, in descending order of amount exported, Canada, the United States, and the Republic of Korea. Petroleum and petroleum products remained the leading imported commodities followed by textiles and flour. Mineral exports from Mongolia were expected to increase during the next few years because of the expected increase in the output of copper, gold, and zinc when new mines are put into operation. China and Russia were Mongolia's two major trading partners (National Statistical Office of Mongolia, 2007, p. 62-70).

Commodity Review

Metals

Copper.—In 2006, Ivanhoe Mines Ltd. of Canada and Rio Tinto plc of the United Kingdom reached an agreement to form a strategic partnership to develop the Oyu Tolgoi copper-gold project, which is located in the South Gobi Region about 80 kilometers (km) north of the Chinese border. In accordance with the 2006 amendments to the minerals law, which gives the Government the option to acquire interests in mineral deposits that are considered "strategic" because they could have an impact on Mongolia's national security and economic and social development, the Mongolian Government set up an interministerial working group to negotiate with Ivanhoe on an investment contract for the Oyu Tolgoi copper-gold project that would include tax restructuring and infrastructure development. Ivanhoe had invested more than $400 million in construction and prospecting work related to the development of the Oyu Tolgoi project. In 2007, a draft agreement between the Government working group and Ivanhoe indicated that the Mongolian Government would have 34% of the Oyu Tolgoi project because the mineral prospecting work was carried out by Ivanhoe, and the Government would supply electricity for Oyu Tolgoi and would build a 150-kilowatt powerplant in the area. A toll road was to be constructed from Oyu Tolgoi to the Chinese border; construction of an airport in the Oyu Tolgoi area was also under consideration. Ivanhoe would build a copper smelter within 10 years. Ivanhoe would be exempted from paying customs taxes on construction equipment and materials. If Ivanhoe were to incur losses, the Mongolian Government would allow the company to delay paying income taxes for a period of 2 years and would not impose deductions if the company transferred its revenues to its headquarters in Australia, Canada, and the United Kingdom. Ivanhoe agreed to sell 1,000 metric tons (t) of gold that it produced from Oyu Tolgoi to the Mongol Bank. Until the copper smelter is put into operation, the extracted copper will be exempted from the 68% windfall tax. If the company fails to put the smelter into operation in 2016, the company must pay all accrued exempted taxes. Under the agreement, gold would be exempted from the windfall tax and income taxes would be reduced by 10%. The agreement would be terminated if the company transfers its license to another company without notifying the Mongolian Government. The draft agreement was accepted by the cabinet and submitted to the Parliament for approval but it faced opposition from several Parliament members. In December 2007, the Government withdrew the draft agreement for further review and reconsideration. The Government decided that revision of the current minerals law would be enacted before concluding an investment agreement for Oyu Tologi (Ivanhoe Mines Ltd., 2008a).

Erdenet Mining Corp. was the sole producer of mined copper in Mongolia. Erdenet's mine output averaged more than 27 million metric tons per year (Mt/yr) of ore and resulted in the production of concentrates that contained more than 130,000 t of copper and 1,500 t of molybdenum. In 2007, owing to a better recovery rate for molybdenum (40.59% in 2007 compared with 29.50% in 2006), the metal content in molybdenum concentrates was 49.74% in 2007 compared with 46.50% in 2006 and the output of molybdenum was about 40% higher in 2007 than in 2006. The "windfall tax" did not have much impact on Erdenet because Erdenet was a state-owned company. Rostekhnologia (Russian Technology) planned to acquire the Russian Government's 49% interest in Erdenet; however, according to the joint-venture agreement between the Governments of Mongolia and Russia, Mongolia has the right to buy Erdenet shares before they are offered to private investors. However, because Rostekhnologia was a Russian state-owned company, it appeared that the transfer of the Government's share to the company would not violate the general agreement (Erdenet Mining Corp., 2008; UB Post, 2008).

Entrée Gold Inc. of Canada held 179,590 hectares (ha) of Shivee Tolgoi properties in southern Mongolia, which comprised three mineral exploration licenses—the Oyu Tolgoi, the Shivee Tolgoi, and the Javkhlant. The Oyu Tolgoi was 100% owned by Ivanhoe. The eastern portion of the Shivee Tolgoi and the entire Javkhlant were subject to an earn-in and equity participation agreement between Entrée and Ivanhoe, dated November 17, 2004. Ivanhoe, which was the project operator, was entitled to earn up to an 80% interest in minerals 560 meters (m) or more below the surface and a 70% interest in minerals above that depth. Ivanhoe must expend $35 million in exploration and development over an 8-year period after November 2004 to earn its full interest in the property. Ivanhoe obtained a 60% interest in the earn-in property in early 2008 after having made expenditures in excess of $27.5 million. Ivanhoe announced the discovery of the Heruga copper, gold, and molybdenum porphyry deposit, which is located within the Javkhlant concession adjoining the southern boundary of Oyu Tolgoi. The deposit is cut by several major brittle fault systems, which partition the deposit into discrete structure blocks. The

deposit is shallowest at the south (approximately 500 m below the surface) and plunges gently to the north. The deposit was estimated to contain 760 million metric tons (Mt) of inferred resources grading 0.48% copper, 0.55 gram per metric ton (g/t) gold, and 142 g/t molybdenum (Ivanhoe Mines Ltd., 2008b).

QGX Ltd. of Canada announced that the company would conduct a final feasibility study, an environmental impact study, and a design plant blueprint for its Golden Hills copper, gold, and silver deposit at an undisclosed location in western Mongolia. QGX owned an 80% share of the Central Valley Zone at Golden Hills. A two-stage development plan with a mine life of 15 years was planned. The plan outlines open pit mining of gold and silver oxide resources followed by underground mining of copper-gold-silver sulfide and quartz-telluride vein resources. The Central Valley Zone contained total measured and indicated resources of 175,000 t of copper, 124 t (3.6 million troy ounces) of silver, and 1.4 t (408,000 troy ounces) of gold. The pre-mining study plan was expected to be completed by April 2011. The company filed the preliminary economic assessment of mineral reserves for Golden Hills to the Minerals Resources Council, which was required by the Mongolia Minerals Law 2006 before application may be made for the conversion of an exploration license to a mining license (QGX Ltd., 2008a).

Gold and Silver.—Gold mining in Mongolia increased significantly during the past decade and, as a result, gold output increased. Domestic gold demand was mainly for jewelry. Boroo Gold Co., in which Centerra Gold Inc. of Canada had a 100% equity interest, was the leading gold producer. In 2007 Boroo produced 7.91 t of gold, a decrease of 8.1% from that of 2006. The decrease in gold production was the result of the low ore grade of the mill feed (3.62 g/t in 2007 compared with 4.25 g/t in 2006). Centerra's board of directors approved a $20 million biooxidation treatment (heap leaching) plant at Boroo to process refractory ore. Construction of the 3-Mt/yr heap leach facility was scheduled to begin in spring 2007 and was expected to be completed in summer 2008. On February 7, 2007, the Mongolian Parliament designated the Boroo deposit as a strategic deposit. Under the minerals law, if a deposit is deemed strategic, the state may take up to a 34% interest in deposits for which exploration was funded by private investors. Centerra and the Government resolved that, under the existing stability agreement, the state would not take an interest in the project and Centerra would pay a 25% corporate income tax and a 5% royalty on minerals mined at the Boroo site until July 2013. The Government also agreed that the windfall profit tax (the rate of which is 68% on sales of gold above $500 per troy ounce) would not apply to the Boroo Mine. The agreement would not apply to the company's Gatsuurt project, however. On December 27, 2007, the Government approved the Gatsuurt in situ reserve and resources data. This would provide the basis for commencement of negotiations of a definitive investment agreement between Centerra and the Government. The negotiation was expected to start after the Parliament election and to be completed in June 2008 (Centerra Gold Inc., 2008, p. 11-12).

In 2006, Mongolia's Mongolrostsvetmet Corp. and Polymetal of Russia signed an agreement to establish a 50-50 joint-venture company, Asgatpolymetal Limited Liability Company, to develop the Asgat silver-polymetallic deposit, which is located 3,000 m above sea level on the territory of Nogoonnuur Soum (located about 180 km from Ulgii) of Bayan-Ulgii Province. The deposit was discovered in 1976 by Russian geologists. Under the joint-venture agreement, Polymetal would provide financing and management for developing the deposit, and Mongolrostsvetmet would provide materials for infrastructure construction in Mongolia. Mongolrostsvetmet was a state-owned company. According to the feasibility study, the deposit had an estimated 39,900 t of copper, 1,271 t of silver, and other minerals. The Government submitted the draft agreement between Polymetal and the Mongolian Government to the Parliament for approval. Some members of the Parliament expressed concerns about the transparency in the Asgat deal and the accuracy of the calculation of metal content in the deposit. A British-based company, Central Asia Metals, offered the use of more advanced technology to evaluate the deposit again and the use of an environmentally friendly extraction method for processing metals. Some members of Parliament were also concerned that the Asgat deposit was awarded without any competitive bidding (Open Society Forum, 2008a).

Iron and Steel.—Central Asia Mineral Exploration, a Mongolian mining and exploration company, provided $500,000 to Ausmelt Ltd. of Australia to undertake a feasibility study for producing pig iron using AusIorn iron-making technology. The study was to investigate the capital and operating costs associated with processing beneficiated Mongolian iron ore and local coal to produce pig iron. The study was undertaken by Ausmelt's partner, China Enfi Engineering Corp. of China. The study was expected to be completed at the end of 2007 (Ausmelt Ltd., 2007).

Mongolia's Durkam Metallurgy Plant used local steel scrap for its steel production. The country's iron ore output was exported mainly to China. No information was available on the output capacities and locations of Mongolia's iron ore mines; however, China's iron and steel producers, such as Baosteel Group Bayi Iron and Steel Co. Ltd., Baotou Iron and Steel Corp., and Shougang Mining Investments Co., were participating in iron ore operations in Mongolia (General Administration of Customs of the People's Republic of China, 2008).

Molybdenum and Tungsten.—The Government approved QGX Ltd. of Canada's application to convert the exploration license for the Undur Tsagaan deposit project to a mining license as well as other pre-mining agreements. The agreements specified that QGX would complete a final feasibility study and an environmental impact study and would obtain approval for plant design of the project by April 2011. The Undur Tsagaan deposit is located in the Khenti Province approximately 300 km to the east of Ulaanbaatar. The deposit had been explored by Russian and Mongolian exploration teams during the early 1980s. The deposit was reported to have 141 Mt of ore grading 0.124% tungsten trioxide, 0.019% molybdenum, 0.08% bismuth, and 0.03% beryllium. A mining license allowed QGX the right to mine at Undur Tsagaan for a period of 30 years; the license could be extended two times for a period of 20 years each. The company planned to conduct tests with the aim of determining if it might be possible to recover 70% tungsten oxide from the ore to produce final products grading 65% tungsten oxide or higher (QGX Ltd., 2008b).

Mineral Fuels

Coal.—Mongolia has substantial coal resources. Coal production continued to increase during the past 2 years. Coal resources in the Ulaannur Basin included the Baruun Naran, the Tavan Tolgoi, and the Ukhaa Khugag deposits. QGX Ltd. of Canada, which held the Baruun Naran exploration license, discovered a total of 24 thick coal seams at the Baruun Naran coalfield, which is located in Umnogovi Province about 500 km south of Ulaanbaatar. Exploration results estimated that the coalfield had coal resources of more than 252.9 Mt of coking and thermal coal, of which 193 Mt was minable. The company planned to have an open pit mining operation, with a coal washing plant to produce a total of 10 Mt/yr of run-of-mine coking and thermal coal for 20 years. The salable product was estimated to total 118 Mt comprising 70 Mt of coking coal and 48 Mt of thermal coal. QGX planned to commence coal production in 2010 and to reach full output capacity in 2012. Annual production of salable coal was expected to be 3.5 Mt of coking coal containing 11% ash and 2.4 Mt of thermal coal (QGX Ltd., 2008c).

The Tavan Tolgoi deposit was located about 20 km to the northeast of the Baruun Naran deposit, and Energoresource of Mongolia held the exploration license. The Tavan Tolgoi deposit was estimated to contain more than 6 billion metric tons of coking and thermal coal. The Government negotiated with Energoresource to transfer the ownership of the deposit, which was covered by six licensing areas to the Government. As a result of the negotiations, Energoresource agreed to transfer five licensing areas to the Government, which represented about 93% of the total coal deposit area. The Government agreed that Energoresource would be a priority preference if a Mongolian private company would be selected to jointly develop the deposit. Several foreign companies, such as Bazovy Element and Severstal Group of Russia, Itochu Corp. and Mitsubishi Corp. of Japan, Peabody Energy Corp. of the United States, and Shenhua Corp. of China were interested in developing the deposit (Open Society Forum, 2008b).

SouthGobi Energy Resources Ltd. (formerly known as Asia Gold) of Canada announced that the Government had approved an environmental impact assessment study and geologic resource report of the Ovoot Tolgoi (formerly known as Nariin Sukhait) coal project. In 2007, the company also received a mining license from the Government for the development of the Ovoot Tolgoi coal deposit, which is located in Omnogovi Province about 320 km southwest of the provincial capital of Dalanzadgad and about 45 km north of the Mongolian border with China. SouthGobi Energy Resources announced that it had arranged fund credit of a maximum of $32 million with Ivanhoe to develop the deposit. The deposit contained combined measured and indicated resources of 259 Mt of coking and thermal coal, with an additional inferred coal resource of about 145 Mt to a depth of 250 m. The SouthGobi Energy Resources-controlled exploration licenses covered 118,989 ha and the mining license that was granted to SouthGobi Energy Resources by the Government covered an additional 9,308 ha, to provide a combined total area of 128,297 ha, which is adjacent to and surrounds the Nariin Sukhait Mine. The commencement of an open pit coal mine was scheduled to begin operations in early 2008, and coal production was to begin in the fall of 2008. The company continued to explore in the southeast field surface and underground areas at Ovoot Tolgoi in 2008. In 2007, the Government completed the transfer of all 35 coal exploration licenses held by Ivanhoe in the South Gobi area to SouthGobi Energy Resources. SouthGobi Energy Resources also discovered coal resources at Tsagaan Tolgoi (White Hill), which is located about 415 km northeast of Ovoot Tolgoi and 113 km southeast of Dalanzagad, which is the capital of Omnogovi Province (SouthGobi Energy Resources Ltd., 2008).

Outlook

The mining industry continues to be one of the country's main pillars of economic development in Mongolia. The Government planned to modify the windfall tax and other regulations to encourage higher mine output and to attract more investment. The Government encourages companies to build smelting plants for copper, gold, and zinc. Mine output was held back partly by uncertainty surrounding the terms of exploitation of strategic mineral deposits. Government decisions with regard to the percentage of the state's participation are pending. The uncertainty prompted some mining companies to reconsider investments for increasing production at existing mines and developing new resources. During the next 10 years, production of minerals and metals is expected to grow because exploitation projects, such as coal deposits (Baruun Naran, Ovoot Tolgoi, and Tavan Tolgoi), copper and gold deposits (Oyu Tolgoi and Tsagaan Suvarga), and gold deposits (Bayangol, Tavt, and Toson) will be put into operation. The discovery of the Chandgana Khavtgai coal deposit by Red Hill Energy Inc. of Canada in the Nyalga basin in the eastern part of Mongolia is significant. Mineral exports are a major source of the Government revenue. Significant decreases in the prices of coal, copper, and gold in the world market would reduce the Government revenues and affect the Government's long-term development goal of improving the living standard of the Mongolian people.

References Cited

Ausmelt Ltd., 2007, Ausmelt to investigate first pig iron project: Dandenong, Victoria, Australia, Ausmelt Ltd. press release, March 7, 1 p.

General Administration of Customs of the People's Republic of China, 2008, China customs statistics yearbook 2007: Beijing, China, General Administration of Customs of the People's Republic of China, CD-ROM.

Centerra Gold Inc., 2008, Centerra Gold reports fourth quarter earnings: Toronto, Ontario, Canada, Centerra Gold Inc. press release, February 5, 31 p.

Erdenet Mining Corp., 2008, Technical and economic factors: Erdenet Mining Corp. (Accessed March 6, 2008, at http://www.emc.erdnet.mn/web_eng/index.php?s_id=18&top_id=1.)

Ivanhoe Mines Ltd., 2008a, Ivanhoe Mines announces financial results and review of operations for the first quarter of 2008: Toronto, Ontario, Canada, Ivanhoe Mines Ltd. press release, May 14, 8 p.

Ivanhoe Mines Ltd., 2008b, Ivanhoe Mines reports an initial 760 million tonne inferred resources estimate for the Heruga copper, gold and molybdenum deposit in Mongolia: Toronto, Ontario, Canada, Ivanhoe Mines Ltd. press release, March 13, 5 p.

Mineral Resources and Petroleum Authority of Mongolia, 2008, Mongolia 2008: Mineral Resources and Petroleum Authority of Mongolia, 16 p.

National Statistical Office of Mongolia, 2007, Monthly bulletin of statistics: National Statistical Office of Mongolia, December, 142 p.

Open Society Forum, 2008a, Democratic Party took a break from the discussion of the draft law on Asgat deposit ownership: Open Society Forum, January 17, 1 p. (Accessed April 22, 2008, at http://www.openforum.mn/print.php?coid=2024.)
Open Society Forum, 2008b, 93.6% of Tavan Tolgoi deposit shares taken by the state: Open Society Forum, March 21, 1 p. (Accessed March 26, 2008, at http://www.openforum.mn/print.php?coid=2068.)
QGX Ltd., 2008a, QGX—Coal and metal assets for Asian markets: Waterdown, Ontario, Canada, QGX Ltd. press release, June 2, 30 p.
QGX Ltd., 2008b, QGX enters into pre-mining agreements with the Government of Mongolia: Waterdown, Ontario, Canada, QGX Ltd. press release, May 1, 3 p.
QGX Ltd., 2008c, QGX receives positive pre-feasibility study result for the Baruun Naran coking and thermal coal project, southern Mongolia: Waterdown, Ontario, Canada, QGX Ltd. press release, January 23, 11 p.
SouthGobi Energy Resources Ltd., 2008, SouthGobi Energy Resources announces major increases in coal resources at its Ovoot Tolgoi coal mine in southern Mongolia: Vancouver, British Columbia, Canada, SouthGobi Energy Resources Ltd. press release, July 31, 5 p.
Triple C LLC Bulletin, 2008a, Major overhaul of the minerals law—Just speculations or a probable event: Triple C LLC Bulletin, no. 8, p. 1.
Triple C LLC Bulletin, 2008b, Proposal for Russian companies entrance to Mongolia's petroleum retail sector: Triple C LLC Bulletin, no. 18, p. 2.
UB Post, 2008, Bid to transfer Russian share in Erdenet: UB Post, February 6. (Accessed February 6, 2008, at http://www.ubpost.mongolnews.mn/index2.php?option=com_content&task=view&id=1349&&pop=1&page=0&Item.)

TABLE 1
MONGOLIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2003	2004	2005	2006	2007
Cement, hydraulic	thousand metric tons	162	62	112	141	180
Coal	do.	5,666	6,794	8,256	7,885	9,560
Copper:						
Mine output, Cu content		130,270	130,000	126,547	129,693	130,160
Metal, refined		1,341	2,376	2,475	2,618	3,007
Fluorspar:						
Acid grade	thousand metric tons	120	148	134	138	131
Submetallurgical and other grade	do.	150	206	233	255	250
Total	do.	270	354	367	393	381
Gold, mine output, Au content[3]	kilograms	11,119	19,240	24,120	22,561	17,473
Gypsum[e]	thousand metric tons	25	25	25	26	26
Iron ore:						
Gross weight	do.	--	33	168	180	265
Iron content	do.	--	21	109	116	170
Lime, hydrated and quicklime	do.	42	30	81	60	43
Molybdenum, mine output, Mo content		1,793	1,141	1,188	1,404	1,978
Petroleum, crude	thousand 42-gallon barrels	183	216	201	369	913
Salt, mine output		1,971	1,550	1,896	1,154	1,143
Silver, mine output, Ag content[e, 4]	kilograms	27,000	28,000	28,000	28,000	28,100
Steel, crude		39,300	54,900	65,500	70,000	80,400
Tungsten, mine output, W content		40	77	54	85	125
Zinc, mine output, Zn content		--	--	11,400	54,850	77,350

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. do., Ditto. -- Zero.
[1]Table includes data available through October 20, 2008.
[2]In addition to the commodities listed, crude construction materials, such as sand and gravel, and varieties of stones, such as limestone and silica, are produced, but available information is inadequate to make reliable estimates of output.
[3]Reported raw gold production but excludes gold contained in copper concentrate.
[4]Based on 55 grams per metric ton silver in copper concentrate.

Sources: National Statistical Office of Mongolia (Ulaanbaatar); Mongolian Statistical Yearbook 2001-2004; Mineral Resources and Petroleum Authority of Mongolia, Output of Mineral Commodities (Minerals Questionnaire 2003-2007).

TABLE 2
MONGOLIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity[e]
Cement		Khutul Cement and Lime Factory	Darkhan-Uul Province, Darkhan	500
Coal		Government Coal Mining Enterprise	Baganuur Mine, Tov Province	4,000
Do.		do.	Shivee Ovoo Mine, Dundgovi (Middle Gobi) Province	2,000
Do.		Chinhua-Mak Nrlin Sukhait Co. (Sino-Mongolian joint venture)	Nariin Sukhait Mine, Omnogovi (South Gobi) Province	3,000
Do.		SouthGobi Energy Resources Ltd.	Ovoot Tolgoi Mine, Omnogovi (South Gobi) Province	3,000
Copper, Cu in concentrates		Erdenet Mining Corp. (Mongolia-Russia joint venture)	Bulgan Province, Erdenet	130
Gold	metric tons	Boroo Gold Co.	Selenge Province, Bayangol	10
Do.		Altan Dornod Mongolia Co. Ltd.	Zaamar placer gold deposit along the Tuul River	3
Do.		Mongolrostsvetmet Corp. (Mongolia-Russia joint venture)	Do.	2
Fluorspar		do.	Bor-Undur Mine in Darkhan, Khenti Province	300
Do.		do.	Urgen Mine in Dornogobi Province	150
Do.		do.	Airag Mine in Dornogobi Province	150
Molybdenum, Mo in concentrates	metric tons	Erdenet Mining Corp. (Mongolia-Russia joint venture)	Bulgan Province, Erdenet	2,000
Steel		Darkham Metallurgy Plant	Darkhan-Uul Province, Darkhan	100
Tungsten (WO_3 content)	metric tons	A state-owned company	Bayan-Ulgii Province, Hovd Gol area	150
Zinc, Zn in concentrates		Tsait Minerals Co. Ltd. (Sino-Mongolian joint venture)	Sukhbaatar Province, Sukhe Bator	70

[e]Estimated. Do., do. Ditto.