

THE MINERAL INDUSTRY OF

MONGOLIA

By John C. Wu

Mongolia is a mineral-rich country. Over the past years, about 80 different minerals had been found in Mongolia. Of these findings, 40 different minerals had been evaluated, and about 150 deposits were being worked by the Government. Coal, copper, fluor spar, and molybdenum were mined by large-scale operations; while clay, gold, gypsum, limestone, salt, sand and gravel, silica, tin, tungsten, and uranium were mined by medium- and small-scale operations. Most of the mining operations were in the north-central and eastern parts of the country. In 1995, Mongolia was the world's fourth largest fluor spar producer and was one of the top three producers of copper and molybdenum in the Asian region.

According to the State Statistical Office of Mongolia (SSOM), the Mongolian economy, as measured by real gross domestic product (GDP), grew 6.3% in 1995 compared with 2.3% in 1994. Mongolia's GDP was estimated at \$869 million.¹ Because of increased output of gold, the mining industry continued the 1994 upward trend. In 1995, the output of the mining industry accounted for about 8% of the GDP of Mongolia. Minerals exports accounted for about 50% of the Mongolia's total export earnings in 1995.

According to the Ministry of Trade and Industry, the two-way merchandise trade increased by 43.8% to \$900.3 million in 1995. Export earnings rose by 39.2% to 511.6 million, while import bills also increased by 50.4% to \$388.7 million in 1995. The two principal exports were minerals and cashmere. Mongolia's merchandises were exported mainly to Japan, 18.7%; Kazakstan, 15.2%; China, 14.3%; Switzerland, 13.2%; and Russia, 13.1%. The two principal import commodities were industrial goods and consumer goods. Mongolia's imports were supplied mainly by Russia, accounting for 52% of Mongolia's imports, followed by Japan, 15%, and China, 10.2%, in 1995.

According to SSOM, the major export mineral commodities in 1995 were copper concentrate, 435,900 metric tons (t); fluor spar concentrate, 114,600 t; and molybdenum concentrate, 3,438 t. The major mineral commodity imports in 1995 were ferrous and nonferrous metals, refined petroleum products, and fertilizer materials.

In mining, production of copper and molybdenum concentrates, by the Erdenet Combine, from the Erdenet Mine in Bulgan Aymag of northern Mongolia was 346,300 t and 3,906 t, respectively, in 1995. The copper concentrate contained about 30% of copper with high content of silver

and selenium. The molybdenum concentrate contained about 47% of molybdenum with high content of rhenium and selenium. The Erdenet Copper Corp., the Mongolian-Russian joint-venture firm of the Erdenet Combine, is owned 51% by the Government of Mongolia and 49% by the Government of Russia.

In 1995, the Erdenet Copper had paid off its \$20 million loan mainly with copper concentrate. In 1992, the company borrowed \$20 million from Itochu Corp. (formerly C. Itoh & Co.) of Japan for improving the mining operation and rehabilitating the milling facilities at its Erdenet copper-molybdenum Combine.²

To extract copper from tailing in the mine dump and from low-grade oxide ore, ERDMIN started construction of a solvent-extraction and electrowinning (SX-EW) plant and related facilities at the Erdenet Combine in 1995. According to an official of ERDMIN, the plant was expected to come on-stream in late summer or early fall of 1996. The SX-EW plant, at the first stage, would have an initial capacity of 3,000 metric tons per year of high-purity refined copper. ERDMIN is owned 51% by the Erdenet Combine and 49% by Nescor of the United States. In 1995, RCM, Inc., the former partner of the Erdenet in ERDMIN, was merged with Nescor.

Mongolia's gold production increased sharply to more than 4 t in 1995 from about 2 t in 1994. In 1995, gold production was by several state-owned mining companies and more than 50 local and joint-venture small mining companies mainly at placer gold deposits in north-central and southwestern Mongolia. Major gold mining areas were at Tolgoit (Tolgoit), at Ikh Ulent, Sharin Gol, Havchuu, Ikh Uvuljuu, and Burhant, all in north-central Mongolia; at Mukhar Ereg and Uvur Chuluut in the Bayakhongor area; at Hailaast, Tosongin Gol; and 13 other placer deposits along the Tuul River in Zaamar area of north-central Mongolia.

Morrison Knudsen Gold Co. (MK Gold), which terminated the Boroo gold exploration project in Tov Aymag, was inactive in 1995. However, two major joint-venture gold projects had moved forward to the development stage. In September, Shizhire Alt (Nugget), a Mongolian-Russian joint venture, opened a placer gold mine in the Zaamar area of north-central Mongolia. The mine was expected to produce about 900 kilograms of gold annually beginning in October 1995 for 30 years.³

In January 1995, Vancouver-based Mongolia Gold Resources Ltd. (MGR) signed a joint-venture agreement with Ulaanbaatar-based Mongol Alt (MA) for exploration and development of the Bumbat Gold Field in the Zaamar area of north-central Mongolia, about 220 kilometers northwest of Ulaanbaatar. The joint-venture project was owned 49% by MGR and 51% by MA. MA is a semi-Government company established by the Government of Mongolia.

Under an agreement with the Government of Mongolia, MGR had been conducting exploration and feasibility study for developing the Bumbat property in Mongolia since 1993. Earlier exploration on one of the three veins indicated a proven and probable reserve of 288,000 t, averaging 15 grams per metric ton (g/t) of gold. Further exploration in 1995 on one of two nearby veins resulted in an additional proven and probable reserve of 18,700 t, averaging 27.2 g/t of gold. According to officials of MGR, the joint-venture project called for an open pit mine and milling operation, which was scheduled to start in late summer of 1996.⁴

Production of tin and tungsten remained small in 1995 because of low prices and reduced export to Russia. Tin mining was at the Bain-Mod (Modot) Mine, the Khujkhan Mine, and the Kharmaitin Mine. Tungsten mining was at the Burentsogt Mine in Dornod Aymag in southeastern Mongolia. The Ulaan Uul Mine and Khovd Gol Mine in Bayan Olgii in western Mongolia and the Tsagaan Davaa Mine in Tov Ayamg in north-central Mongolia, near Ulaanbaatar, were not producing tungsten and remained close in 1995. The Government continued to promote further exploration and development of the Undur Tsagaan tungsten deposit in Hentiy, where ore reserves had been estimated at 141 million metric tons, grading 0.124% tungsten trioxide.

In 1995, both production and exports of fluor spar had returned to the normal level. Production of direct-shiping metallurgical-grade fluor spar was about 530,000 t, while production of acid-grade calcium fluoride (fluor spar concentrate) was 120,000 t. Metallurgical-grade fluor spar and fluor spar concentrate were all exported to Russia. Mongolsovtvetmet, a joint-venture firm owned 51% by Mongolia and 49% by Russia, operated an underground mine and an open pit mine as well as a fluor spar concentrator at Bor Ondor in Hentiy Aymag. It also operated open pit mines at Khar-Airag, Khajuu (Khazhu) Ulaan, and Urgon (Orgon)

in Dornгови Aymag; and an underground mine at Berh in Henity Aymag.

Coal production dropped to a 9-year low in 1995 because of the continued shortage of spare parts for mining equipment. The Baga Nuur Mine and the Shariyn Gol Mine were the two major producing mines in 1995.

In June 1995, SOCO of the United States completed the testing of the Sotamo-1 wildcat well in Block XIX in the Tamtsag Basin of eastern Mongolia. According to the company, the testing results indicated the presence of hydrocarbons in the Basin. However, the well was determined to not be commercially viable and was plugged. In August, the company began drilling its second well, Sotamo 19-2 in the Tamtsag Basin. The well, which had a target depth of 3,400 meters (m), was drilled to a depth of 3,019 m, but the drilling was suspended in November for the winter. According to the company, a total of 3.4 m of what appeared to be productive oil sands were logged and an additional 43.9 m of possible oil and gas sands were identified. The results of the Sotamo 19-2 indicated that the Tamtsag Basin has the potential to become a major oil-producing province.⁵

¹Where necessary, values have been converted from Mongolian tugriks (Tug) to U.S. dollars at the rate of Tug450=US\$1.00 in 1995.

²The Mongol Messenger (Ulaanbaatar). "Runaway Success of Erdenet Concern." No. 5 (239), Feb. 7, 1996, p. 2.

³Mongolia Monthly (Seattle). "Russian-Mongolian Gold Mine Opened." V. 1, No. 9, Sept. 1995, p. 4.

⁴The Northern Miner (Toronto). "Mongolia Gold Divides Time Between Asia and Canada." Nov. 27, 1995, p. C1.

⁵Mongolian Monthly (Seattle). "Soco Announces Oil Drill Results." V. 1, No. 11, Nov. 1995, p. 4.

Major Sources of Information

The Ministry of Energy, Geology, and Mining
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Major Publications

Statistical Office of Mongolia: Monthly Bulletin of Statistics, 1995.

TABLE 1
MONGOLIA: PRODUCTION OF MINERAL COMMODITIES e/ 1/

(Metric tons unless otherwise specified)

| Commodity 2/ | 1991 | 1992 | 1993 | 1994 | 1995p/ |
|--|--------|---------|--------|----------|---------|
| Cement, hydraulic 3/ | 227 | 133 | 82 | 86 | 109 |
| Coal: 3/ | | | | | |
| Anthracite and bituminous | 587 | 570 | 520 | 500 | 500 |
| Lignite and brown | 6,450 | 5,677 | 5,089 | 4,510 r/ | 4,371 |
| Total | 7,037 | 6,247 | 5,609 | 5,010 | 4,871 |
| Copper, mine output, Cu content 3/ | 90,100 | 105,100 | 96,900 | 99,600 | 100,400 |
| Fluorspar: | | | | | |
| Acid grade 3/ | 120 | 97 | 77 r/ | 88 r/ | 120 |
| Submetallurgical and other grade e/ | 355 r/ | 287 r/ | 276 r/ | 85 r/ | 120 |
| Total | 475 r/ | 384 r/ | 353 r/ | 173 r/ | 240 |
| Gold, mine output, Au content 4/ | 800 | 900 | 1,200 | 2,000 | 4,800 |
| Gypsum | 25 | 25 | 25 | 25 | 25 |
| Lime, hydrated and quicklime 3/ | 76 | 68 | 51 | 66 | 51 |
| Molybdenum, mine output, Mo content 3/ | 1,716 | 1,610 | 2,050 | 2,100 | 1,830 |
| Salt, mine output 3/ | 816 r/ | 216 r/ | 14 r/ | 629 r/ | 726 |
| Silver, mine output, Ag content 5/ | 15,500 | 18,000 | 17,500 | 20,000 | 20,000 |
| Tin, mine output, Sn content | 250 | 190 | 150 | 100 | 150 |
| Tungsten, mine output, W content | 300 | 260 | 250 | 150 | 200 |
| Uranium, mine output, U content | 130 | 120 | 100 | 100 | 100 |

e/ Estimated. r/ Revised. p/ Preliminary.

1/ Table includes data available through July 26, 1996.

2/ In addition to the commodities listed, crude construction materials such as sand and gravel, varieties of stone such as limestone, and silica are produced, but available information is inadequate to make reliable estimate of output levels.

3/ Reported.

4/ Includes reported raw gold production and estimated gold contained in copper concentrate.

5/ Silver contained in copper concentrate.

Source: Statistical Office of Mongolia (Ulaanbaatar). Monthly Bulletin of Statistics, 1996.