

# THE MINERAL INDUSTRY OF

# ARMENIA

By Richard M. Levine

In recent years, Armenia's mineral industry has been primarily involved in mining nonferrous metals and industrial minerals. The country has large molybdenum reserves, which are associated with copper, and had been mining one-third of the former Soviet Union's (FSU) output of molybdenum. It also mined copper, copper-zinc, and native gold deposits. Significant byproduct constituents in the country's nonferrous ores included barite, gold, lead, rhenium, selenium, silver, tellurium, and zinc.

Armenia had a large industrial minerals industry and was the largest producer of perlite in the Soviet Union. It produced a number of other industrial minerals, which included clays, diatomite, dimension stone, limestone, salt, and semiprecious stones, and had a diamond-cutting industry. Armenia, however, had practically no mineral fuel production and was dependent on imported mineral fuels. Owing to blockades that were imposed by Azerbaijan and Turkey imposed in 1991 and 1993, respectively, its only sources of fuel were gas shipments from Turkmenistan through Russian and Georgian pipeline networks, as well as shipments by railcars or trucks of petroleum refinery products from Georgia's Batumi refinery (U.S. Energy Information Administration, December 1996, Armenia—Oil, accessed August 5, 1998, at URL <http://www.eia.doe.gov/emeu/cabs/armenia.html>; Energy Information Administration, August 2000, Armenia—section, accessed August 24, 2000, at URL <http://www.eia.doe.gov/emeu/cabs/armenia.html>).

Faced with an acute energy crisis, Armenia resumed operation of its Metsamor nuclear powerplant in 1995. Metsamor had been closed in 1989 because of safety fears that related, in large part, to the area's seismicity. The decision to reactivate the plant was controversial, and European countries expressed concern that Armenia shut down this reactor. Statements from the Armenian Government stressed that this would be contingent on the country securing an alternative source of electricity (U.S. Energy Information Administration, August 2000, Armenia—Electricity, accessed August 24, 2000, at URL <http://www.eia.doe.gov/emeu/cabs/armenia.html>).

Ensuring the country's energy supply remained one of the most important issues. Gas supplies have been cut off sporadically because of ethnic and civil unrest in the Caucasus, pipeline accidents, and nonpayment of debts. Armenia was exploring the option of using other gas suppliers, mainly Iran. The construction of a pipeline for importing Iranian gas into Armenia, as well as possibly exporting Iranian gas to Europe through the Russian gas grid was under consideration (Energy Information Administration, August 2000, Armenia—section, accessed August 24, 2000, at URL <http://www.eia.doe.gov/emeu/cabs/armenia.html>).

In 1999, Armenia's gross domestic product increased by 3.3% in current prices, and industrial output, by 5.2% in

constant prices compared with that of 1998 (Interfax Statistical Report, 2000). Production increased by 15.6% in the mining and quarrying sector and by 39.3% in the metallurgical sector, although production decreased by 33.1% for rolled aluminum and by 5% for aluminum foil. Production decreased for some nonmetallic mineral products, such as cement. Mineral products, which composed the largest category of exports and imports, accounted for more than 70% of the value of exports and for more than 33% of the value of imports in 1999 (Interfax Statistical Report, 2000).

Armenia was reviving production of nonferrous metals and industrial minerals. Foreign investment was playing an important role in restoring output and creating facilities to produce value-added products. Privatization of industries began in 1994 and was continuing.

In 1997, Manes & Valex, which was an Armenian-Lichtenstein joint venture, was established in the Tumanyan region of the Lori Province to produce blister copper for export. The joint venture has partially rehabilitated the Alaverdi smelter, which was closed in 1988, in part, because of environmental concerns (George Isayan, July 7, 1999, Report on Lori Province, 1999, U.S. Department of Commerce report, accessed September 9, 2000, at URL <http://www.tradeport.org/ts/countries/armenia/mrr/mark0016.html>).

Armenia was attempting to privatize such major enterprises as the Kanaker aluminum plant (Ivanov, 1999). Another major enterprise being privatized in 1999 was the Shoghakn diamond-cutting plant, which was sold to Leviev International Diamonds Ltd. of Israel (Interfax Mining and Metals Report, 1999, 2000c).

Armenia's major producers of nonferrous metals increased output in 1999 in comparison with that of 1998. The country's three operating mining complexes—the Zangezur and Agarak copper-molybdenum mining complexes and the Kapan copper mining complex—were located in southeastern Armenia. Zangezur, which was the largest complex, [open pit] mined the Kadzaran copper-molybdenum deposit. It produced 7,981 metric tons (t) of copper in concentrate and 5,377 t of molybdenum concentrate in 1999 compared with 6,938 t of copper in concentrate and 4,510 t of molybdenum concentrate in 1998 (Interfax Mining and Metals Report, 2000b). In 1999, Agarak, which developed a copper-molybdenum deposit, mined 300,000 t of ore to produce 807 t of copper in concentrate and 28 t of molybdenum concentrate compared with 372,000 t of ore to produce 791 t of copper in concentrate and 57 t of molybdenum concentrate in 1998 (Interfax Mining and Metals Report, 2000b).

Kapan operated the Kapan and the Shaumian Mines. Although production figures for Kapan were not reported, Kapan probably produced approximately 800 t of copper in concentrate, which was the difference between the national

production total and the total combined output for Agarak and Zangezur (Mining and Metals Report, 2000b).

Attempts were being made to conduct larger scale gold mining at Megradzor and Zod, which were the country's two gold deposits. Zod is northeast of Lake Sevan at an altitude of about 2,200 meters in eastern Armenia. Mining at Zod started in 1976 and was conducted by open pit and underground methods, but in 1997, mining was halted (Mining Watch Canada/Mines Alerte, May 4, 2000, Written presentation to the Standing Committee on Foreign Affairs and International Trade, accessed September 6, 2000, at URL [http://www.miningwatch.ca/publications/SCFAIT\\_Central\\_Asia\\_brief.html](http://www.miningwatch.ca/publications/SCFAIT_Central_Asia_brief.html)). Zod is near the border region with Azerbaijan. Azerbaijan maintained that 73% of the Zod deposit (referred to by Azerbaijan as the "Sutlinskoye" deposit) is on its territory in an area situated between Armenia and Nagorno Karabakh, which is an area of Azerbaijan with a majority Armenian population; Nagorno Karabakh has waged a war of secession against Azerbaijan (Yudanov, 1999). Megradzor is in the Hrazdon district about 50 kilometers (km) north of Yerevan and 18 km northwest of Hradan. An underground mine was developed at the deposit, but in 1997, mining also was halted at Megradzor. Megradzor is close to the site of the disastrous earthquake of 1988 (Mining Watch Canada/Mines Alerte, May 4, 2000, Written presentation to the Standing Committee on Foreign Affairs and International Trade, accessed September 6, 2000, at URL [http://www.miningwatch.ca/publications/SCFAIT\\_Central\\_Asia\\_brief.html](http://www.miningwatch.ca/publications/SCFAIT_Central_Asia_brief.html)).

A gold development joint venture was established between Armzoloto of Armenia and First Dynasty Mines Ltd. (previously known as Global Gold) of Canada. First Dynasty intended to process the tailings from the Ararat ore-processing plant, to reopen the Zod and Megradzor Mines, and to continue processing additional tailings. In February 1998, the joint venture commissioned a new \$12 million gold tailings recovery facility at Ararat. The old ore-treatment plant had processed about 12 million metric tons per year (Mt/yr) of raw material. The tailings from this operation were deposited in a tailings containment area 5.5 km from the plant site. The tailings recovery plant would process stored tailings by using a cyanide vat leach. The unloading, crushing, grinding, and flotation facilities of the old processing plant were combined with the gold recovery operations of the new plant (Mining Watch Canada/Mines Alerte, May 4, 2000, Written presentation to the Standing Committee on Foreign Affairs and International Trade, accessed September 6, 2000, at URL [http://www.miningwatch.ca/publications/SCFAIT\\_Central\\_Asia\\_brief.html](http://www.miningwatch.ca/publications/SCFAIT_Central_Asia_brief.html)). A feasibility study, which was completed in July 1998, indicated a gold reserve of about 62 t (2 million troy ounces), the majority of which was in the Zod deposit where the ore grade reportedly averaged 7.4 grams per metric ton of gold (First Dynasty Mines, September 7, 2000, Corporate profile—Armenia, accessed September 8, 2000, at URL <http://www.firstdynasty.com/s/CorporateProfile.asp>). New production would eventually be processed simultaneously with reclaimed tailings. First Dynasty was adding new capacity at the Ararat gold recovery project to increase annual production from about 1 t (30,000 troy ounces) to about 2.5 t (80,000 troy ounces) of gold (First Dynasty

Mines, September 7, 2000, Corporate Profile—Armenia, accessed September 8, 2000, at URL <http://www.firstdynasty.com/s/CorporateProfile.asp>). According to First Dynasty's Annual Information Form, total project life of these mines would be 11 years (Mining Watch Canada/Mines Alerte, May 4, 2000, Written presentation to the Standing Committee on Foreign Affairs and International Trade, accessed September 6, 2000, at URL [http://www.miningwatch.ca/publications/SCFAIT\\_Central\\_Asia\\_brief.html](http://www.miningwatch.ca/publications/SCFAIT_Central_Asia_brief.html)).

The diamond-cutting industry was expanding and accounted for a significant share of the country's export earnings. Armenia had four state diamond-cutting plants and a number of private diamond-cutting enterprises. In 1999, the total value of production was \$85 million. The industry planned to increase output to between \$100 million and \$120 million in 2000 and to increase production by another \$50 million within the following 2 to 3 years (Interfax Mining and Metals Report, 2000d; George Isayan, U.S. Embassy, Yerevan, Armenia, May 16, 2000, Brief overview of Armenia's diamond-cutting industry, Cable, accessed August 29, 2000, at URL <http://www.bisnis.doc.gov/bisnis/country/000517rocks.htm>). Sapphire, which was the country's first diamond-cutting plant, was established during the Soviet period in 1973 in Nor-Hachyn near Yerevan.

Russia's exports of uncut diamonds to Armenia ceased in 1995 but resumed in 1999 because of an intergovernmental agreement on the delivery of Russian raw diamonds to Armenia in 1999-2001 whereby Alrosa, which was a Russian firm, agreed to supply Armenia with 30,000 carats per year of Russian diamonds (Yudanov, 1999; Foreign Broadcast Information Service, November 26, 1998, Primakov—Russia-Armenia ties have great potential, Radio Broadcast [Moscow Interfax in English] transcription, accessed August 14, 2000, at URL <http://fbis.fedworld.gov>). Armenia's diamond-cutting industry had established other sources of supply. In 1992, the Arslanian cutting works firm of Belgium established the Lori diamond-cutting enterprise. In 1999, Lori employed about 400 diamond cutters. It worked under an agreement in which the Belgian company supplied uncut diamonds to Lori and Lori then returned the cut diamonds to Arslanian for sale. In 1999, Lori's total volume of output was valued at about \$20 million. Arslanian also supplied uncut diamonds to the privately owned Aghavni and Andranik diamond-cutting plants that were established near the Lori plant in the 1990's, the state-controlled Lusampor plant in Melikgyugh in Aragtsotn province, and the private Amma plant in the town of Artashat in Ararat province. The Belgian firm Tashe was also a supplier of diamonds to Armenian cutting enterprises and with Arslanian established a new company called Arevakan L. L. C., which was constructing a cutting works in the village of Nor-Hachyn.

The Diamond Company of Armenia (DCA) in Yerevan, which was owned by the British company Furfano, started operations in May 1999, and its production volume in 1999 was valued at nearly \$33 million. DCA was projected to produce up to \$50 million in 2000. The company's main supplier and distributor was De Amdel N.V. from Belgium, which was affiliated with De Beers (Interfax Mining and Metals Report, 2000a, d; George Isayan, U.S. Embassy, Yerevan, Armenia, May 16, 2000, Brief overview of Armenia's diamond-cutting

industry, Cable, accessed August 29, 2000, at URL <http://www.bisnis.doc.gov/bisnis/country/000517rocks.htm>).

The largest state diamond-cutting enterprise was Shoghakn. In 1999, its total volume of production was valued at \$15 million compared with \$22 million in 1998 (Interfax Mining and Metals Report 2000d).

When the U.S. company Dicalite purchased the state enterprise Aragats-Perlite for \$1.42 million in June 1998, it obtained the rights to mine the Aragats perlite deposit for 22 years and to extract 1.11 Mt/yr (600,000 cubic meters) of raw material. The Aragats deposit's reserves were reportedly about 160 million metric tons (Mt), which was more than one-half of Armenia's total perlite reserves (Narine Khachataryn, April 28, 1999, US perlite firm practices criticized, [Noyan Tapan in Russian] transcription, accessed August 5, 2000, at URL <http://fbis.fedworld.gov>).

Since the beginning of 1999, Dicalite exported raw material from this deposit to its own perlite-processing enterprises in Europe. Prior to the beginning of the 1990's, Dicalite traditionally purchased perlite from Armenia. Products obtained from its perlite processing were sold on Western European markets and to the recently growing Russian market. Dicalite planned to increase exports of raw perlite to 200,000 t by the end of 1999 (no information was located in the preparation of this report that would substantiate that this goal was achieved). For the leasing period (22 years), Dicalite had the right to export about 24 Mt of raw material from the country on the basis of an agreement signed with the Ministry of Environmental Protection (Narine Khachataryn, April 28, 1999, U.S. perlite firm practices criticized, [Noyan Tapan in Russian] transcription, accessed August 5, 2000, at URL <http://fbis.fedworld.gov>).

In 1999, Armenia's economy showed signs of recovery and stabilization, and the country's mineral industry was seeking foreign investment to assist in its development and transformation.

## References Cited

- Interfax Mining and Metals Report, 1999, Armenia to sell biggest diamond cutting plant to Israeli firm: Interfax Mining and Metals Report, v. 8, issue 41, October 1-7, p. 10.
- 2000a, Armenian diamond company exports totaled \$32 mln in 1999: Interfax Mining and Metals Report, v. 9, issue 10, March 3-9, p. 7.
- 2000b, Armenia raises copper, molybdenum, zinc production in 1999: Interfax Mining and Metals Report, v. 9, issue 12, March 17-21, p. 10-11).
- 2000c, Armenia sells cutting plant to LLD for \$370,000, Interfax Mining and Metals Report, v. 9, issue 30, July 21-27, p. 9-10.
- 2000d, Armenia to double cut diamond exports: Interfax Mining and Metals Report, v. 9, issue 7, February 11-17, p. 1.
- Interfax Statistical Report, 2000, Armenia's economy in 1999: Interfax Statistical Report, v. 9, issue 17, April 21-27, p. 5-14.
- Ivanov, Nikolay, 1999, Armenian aluminum to become Siberian: Moscow, Kommersant, December 9, p. 5.
- Yudanov, Yu. I., 1999, The Transcaucasus—Estimates of investment attractiveness: Moscow, Mirovaya Ekonomika i Mezhdunarodniye Otnosheniya, no. 11, October 18, p. 101-112.

## Major Sources of Information

Ministry of Agriculture and Environmental Protection  
48 Nalbandian St.  
Yerevan 375010  
Armenia  
Telephone: 374-1-524-641, 506-555  
Fax: 374-1-151-583

Ministry of Energy  
2d Government House, Republic Square  
Yerevan 375010  
Armenia  
Telephone: 374-1-521-964, 506-126  
Fax: 374-1-151-687, 526-365

Ministry of Finance and Economy  
1 Melik-Adamyany St.  
Yerevan-10  
Armenia  
Telephone: 374-1-595-304  
Fax: 374-1-524-282, 151-069  
E-mail: [staff@mf.gov.am](mailto:staff@mf.gov.am)

Ministry of Industry and Trade  
5 Hanrapetutian St.  
Yerevan 375010  
Armenia  
Telephone: 374-1-522-884, 506-134  
Fax: 374-1-151-081, 526-577

Ministry of Statistics, State Registrar and Analysis  
3, Government House  
Republic Square  
Yerevan 375010  
Armenia  
Telephone: 885-2-524-213  
Fax: 885-2-521-921  
E-mail: [armstat@sci.am](mailto:armstat@sci.am)  
Internet: <http://www.sci.am/armstat>

Customs Department of Armenia  
4 Kochar St.  
Yerevan 375010  
Armenia  
Telephone: 374-1-269-035  
Fax: 374-1-269-135  
Website: [www.tpa.am/racustoms/index.html](http://www.tpa.am/racustoms/index.html)

Customs Department of the Ministry of State Revenues  
3 Movses Khorenatsi St.  
Yerevan-15  
Armenia  
Telephone: 374-1-538-192  
Fax: 374-1-537-125

Tax Inspection Administration  
3 Movses Khorenatsy St.  
Yerevan 375015  
Armenia  
Telephone: 374-1-538-101  
Fax: 374-1-151-967

TABLE 1  
ARMENIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1995	1996	1997	1998	1999 e/	
Bentonite	110	2,750 r/	2,750 r/ e/	3,000 e/	3,000	
Cement	thousand metric tons	228	282	297 r/	314	287 3/
Copper:						
Concentrate, Cu content	8,080	9,080	9,300	9,158	9,611 3/	
Blister	--	--	5,000	3,000	5,000	
Gold	kilograms	514	244	500 r/ e/	700	1,200
Limestone	thousand metric tons	1,500 r/	1,800 r/	1,700 r/	1,700	1,700
Molybdenum, concentrate, Mo content	1,500	1,800 r/	1,800 r/ e/	2,500	2,900	
Perlite e/	6,000 r/	6,000 r/	6,000 r/	35,000	35,000	
Salt	32,800	26,400	26,000 r/ e/	24,911	26,955 3/	
Silver	kilograms	184	626	1,000	1,000	1,200
Zinc, concentrate, Zn content e/	700	820	830	825	871 3/	

e/ Estimated. r/ Revised. -- Zero.

1/ Table includes data available through September 2000.

2/ Estimated data are rounded to no more than three significant digits.

3/ Reported figure.

TABLE 2  
ARMENIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1999

(Metric tons unless otherwise specified)

Commodity	Major operating companies	Location	Annual capacity e/	
Aluminum, rolled and foil	Kanaker aluminium plant	Kanaker	25,000	
Copper, mine output, Cu content	Kapan mining directorate	Kapan	30,000 1/	
	Shamlug mining directorate (not in operation)	Shamlug		
	Akhtala mining directorate (not in operation)	Akhtala		
	Zangezur copper-molybdenum complex mining Kadzharan deposit	Kadzharan		
	Agarak copper-molybdenum mining and processing complex	Agarak		
Copper, blister	Manes and Valex joint stock company	Alaverdi	5,000	
Diamonds, cut stones	thousand carats	Aghavni diamond cutting works	Nor Geghi	NA
	Do.	Amma group diamond cutting works	Artashat	NA
	Do.	Andranik diamond cutting works	Nor Hachyn	NA
	Do.	Diamond Company of Armenia (DCA)	Yerevan	NA
	Do.	Lori diamond cutting works	Nor Hachyn	NA
	Do.	Lusampor	Melikgyugh	NA
	Do.	Punji diamond cutting works	Yerevan	NA
	Do.	Sapphire diamond cutting works	Nor Hachyn	NA
	Do.	Shoghakn gem cutting plant	do.	120
	Gold	Zod mining complex (mining ceased in 1997)	Zod	2 1/
Megradzor deposit (mining ceased in 1997)		Megradzor		
Molybdenum, mine output, Mo content	Do.	Ararat gold processing and tailings recovery plant	Ararat	1
	Zangezur copper-molybdenum complex mines Kadzharan deposit	Kadzharan	8,000 1/	
	Agarak copper-molybdenum mining complex	Agarak		
Perlite	Aragats-Perlite mining and beneficiation complex	Aragats	200	
Zinc, mine output, Zn content	Kapan mining directorate	Kapan	NA	

e/ Estimated. NA Not available.

1/ Capacity estimates are the total for all enterprises that produce that commodity if these enterprises were producing at a much higher rate of capacity utilization than that of 1999.