



2012 Minerals Yearbook

LAOS

THE MINERAL INDUSTRY OF LAOS

By Yolanda Fong-Sam

In 2012, Laos produced a variety of mineral commodities. These included barite, gold, iron ore, lead, and silicon metal, for which production increased significantly compared with that of 2011. On the other hand, significant decreases in production were reported for anthracite (19.8%) and gypsum (15.7%) (table 1).

On October 26, 2012, the General Council of the World Trade Organization (WTO) approved Laos to join the WTO, 15 years after the country first applied for membership. On January 3, 2013, the Government of Laos informed the WTO that it had ratified its membership, and, on February 2, Laos officially became the 158th member of the organization. During the 15 years of negotiations, Laos implemented significant domestic reforms and adjustments for its WTO accession; additionally, the Government passed more than 90 laws and regulations in the areas of customs valuation, import licensing, intellectual property rights, investments, technical barriers to trade, and trading rights. Laos' accession to the WTO opened the door for the country to join the international trading community, backed up with a legal platform; gave it to access other WTO members' markets; and enabled it to become part of a transparent international trading system. By accepting WTO membership, Laos became subject to market access commitments for its goods and services, subsidy limits in agriculture, and a tariff ceiling on goods. Laos also committed to engage in bilateral and multilateral negotiations on partnership agreements with nine other WTO members, including the United States, Australia, Canada, China, Chinese Taipei (defined by the WTO as the separate customs Territory of Taiwan, Kinmen, Matsu, and Penghu), the European Union, Japan, the Republic of Korea, and Ukraine (World Trade Organization, 2012a, b; 2013a, b).

In October, the Laos Ministry of Energy and Mining announced that it had agreed with the Government of China on the financing of a railway designed to ship raw materials from Laos' capital city of Vientiane to Yunnan Province in China. China agreed to provide a \$7 billion loan to finance the project, which would consist of approximately 420 kilometers (km) of rail line and was expected to be commissioned by 2017. By 2020, China expected to secure 5 million metric tons per year (Mt/yr) of mineral commodities by way of the rail line, which was expected to include such raw materials as bauxite, copper, gold, iron ore, lead, potash, and zinc, as well as agricultural and timber products (Gronholt-Pedersen, 2012; Railway Gazette, 2012).

In November, the Ministry of Energy and Mines announced its plans to continue with the construction of the Xayaburi Dam on the Mekong River; the river is shared with the neighboring countries of Cambodia, Thailand, and Vietnam. In the past, Laos had encountered opposition from some neighboring countries regarding the environmental impact of such a project and the threat to the livelihood of the population living down the river. With the Xayaburi Dam and other proposed mainstream dams

on the Mekong River, Laos intended to triple its hydroelectric power production in order to sell it to its neighbors. The international consortium for the project, Xayaburi Power Co., had started infrastructure construction in the area. The total cost for the Xayaburi Dam was estimated to be \$3.8 billion. No projected completion date for the dam had yet been released (Otto, 2012).

Minerals in the National Economy

In 2012, the industrial sector as a whole, which included the construction, electricity, manufacturing, and mining and quarrying sectors, contributed 28.3% to Laos' gross domestic product (GDP) (at constant 2002 prices) compared with 27.5% in 2011. Specifically, the mining and quarrying sector contributed about 7.0% to Laos' GDP in both 2011 and 2012. The construction sector contributed 6.7% to the GDP compared with 6.1% in 2011. Foreign direct investment in the mineral industry amounted to \$662.5 million in 2012 (Bank of the Lao PDR, 2012, p. 8, 10, 48, 65).

Government Policies and Programs

The mineral sector in Laos is governed by the Mining Law of 2008, which had been in the implementation stage since the law's adoption. Mining projects, however, had been under a moratorium imposed by the Government since 2009, and no new mining licenses had been issued since the moratorium went into effect. The moratorium was implemented in 2009 as details emerged on licensed projects that had been inactive for an extended period of time and findings that mining operations were causing environmental damage and social concerns. The Government updated its projected timeframe to start granting new licenses to between 2015 and 2016 (it was previously estimated for 2014), once an effective monitoring system and an appropriate land management system are implemented in the country. In addition, the Government was working towards reforming its legal system to a more standardized and plan-based one, which would affect mainly Laos' trading system and development in the private sector. The Government was also reviewing the laws regarding natural resource management. The Ministry of Natural Resources and the Environment was in charge of the compilation of a geologic database to more efficiently manage its oversight of exploration and mining projects. Although a moratorium remained in place, the Government did allow for land assessments and surveys (Lao Voices, 2011; Mining Journal, 2012a).

The Mining Law of 2008 establishes the requirements for obtaining a mining license to develop a mineral project. The Department of Mines issues the mining licenses. The Department of Geology and the Department of Mines jointly oversee the implementation of the Mining Law, which includes

inspecting and monitoring mineral development activities in the country; they also assist in the negotiation of mining contracts and in mineral exploration and mining licensing activities, promote investment in the mining sector, maintain other geologic databases, and provide mineral exploration support and data analyses (Department of Geology and Mines of Laos PDR, 2010a, b).

Structure of the Mineral Industry

As of yearend 2011 (the latest year for which data were available), a total of 152 mining companies were operating in Laos, of which 70 were locally owned and 82 were foreign enterprises. During the past few years, the Government had authorized mining companies to operate on 256 mining concessions across the country (Lao Voices, 2011). Laos has a variety of undeveloped mineral resources, and the Government recognized mining as a critical sector of the economy and continued to support the development of the sector by promoting domestic and foreign investment. In 2012, the main producers of copper, gold, and silver in Laos were Lane Xang Minerals Ltd. (MMG LXML), which was a subsidiary of MMG Ltd. of Hong Kong (90% interest) and the Government (10% interest), and PanAust Ltd. of Australia. The country's major mineral industry facilities and their capacities are listed in table 2.

Mineral Trade

In 2012, total trade in Laos was reported to be \$4.7 billion, which represented an increase of 3.1% compared with that of 2011. The country's total exports were valued at about \$2.3 billion, which was an increase of 3.6% compared with that of 2011. The value of mineral commodity exports amounted to \$947 million (41.7% of total exports) and that of electricity exports amounted to \$502 million (22.1% of total exports). Mineral commodity exports included copper (valued at \$683 million, or 30.1% of total exports) and gold (valued at \$151 million, or 6.6% of total exports). The total value of imports in 2012 increased by 2.6% to \$2,467 million, of which electricity imports amounted to \$63 million (an increase of 55% compared with that of 2011) and gold and silver imports combined amounted to \$8.55 million (Bank of the Lao PDR, 2012, p. 34, 61).

Commodity Review

Metals

Bauxite and Alumina.—The Laos Bolaven Plateau bauxite project, which is located in the southern part of the country, was being developed by Sino Australian Resources (Laos) Co., Ltd. (SARCO). SARCO was a joint venture between China Nonferrous Metals Industry's Foreign Engineering and Construction Co., Ltd. of China (NFC) (51% interest) and ORD River Resources Ltd. of Australia (49% interest). SARCO had two tenements in the property for a total of 487 square kilometers (km²). They were the LSI tenement, which covers a 66-km² area, and the Yuqida tenement, which

covers a 421-km² area. In April, after an extensive drilling campaign during 2010 and 2011, ORD announced that the resource estimate at the Bolaven Plateau project was upgraded in accordance with the Australasian code for reporting of exploration results, mineral resources, and ore reserves [the Joint Ore Reserves Committee (JORC) Code]. Total resources for the project were 226 million metric tons (Mt) at grades of 26.7% alumina and 2.62% silica content; the previously reported estimate was 130 Mt at average grades of 31.7% alumina and 3.2% silica. The total measured resource was estimated to be 69 Mt at grades of 28.1% alumina and 2.09% silica. In September, SARCO started two studies on the Bolaven Plateau bauxite project to support the company's application for a mining license, which SARCO was expecting to be approved by mid-2013. After the acquisition of the license, SARCO planned to conduct a feasibility study to develop a 600,000-metric-ton-per-year (t/yr)-capacity alumina refinery (ORD River Resources Ltd., 2012a, b).

Copper, Gold, and Silver.—In 2012, the Sepon copper-gold project produced a total of 86,295 metric tons (t) of copper cathodes, which exceeded the targeted production of 84,000 t for the year, and 2,186 kilograms (kg) of gold. This production represented an increase of about 9.4% for copper and a decrease of about 5.7% for gold, respectively, compared with production in 2011. The increase in copper production was mainly owing to productivity improvements implemented during the fourth quarter of 2012. MMG LXML expected to produce between 83,000 and 88,000 t of cathode during 2013. On the other hand, the decrease in gold production was caused mainly by a decrease in ore availability and lower gold grades. MMG LXML, which was the Sepon project's operator, expected to produce between 1,400 and 1,700 kg of gold in 2013, although in late 2011 it was determined that the oxide gold ore supply in Sepon would be depleted by 2013 (MMG Ltd., 2013).

PanAust Ltd., through its wholly owned subsidiary Pan Mekong Exploration Pty. Ltd., owned a 90% interest in the Lao-registered company Phu Bia Mining Ltd. (PBM) (which managed the Phu Kham copper-gold operation) and the Government owned the remaining 10%. The Government and PBM had a mineral exploration and production agreement that regulated exploration and mining within the company's contracted 2,636-km² area. In 2012, the Phu Kham copper-gold operation, which is located approximately 140 km north of the capital city of Vientiane, had produced 63,285 t of copper concentrate, which was an increase of 5.7% compared with that of 2011 (table 1). The mine also produced 1,851 kg of gold, which was an increase of about 11% compared with the 1,667 kg produced in 2011; and 14,617 kg of silver, which was a decrease of 12.7% compared with the 16,738 kg of silver produced in 2011. The Phu Kham upgrade project, which was commissioned in the third quarter of 2012, increased its designed processing capacity to 16 Mt/yr of ore from its original capacity of 12 Mt/yr. The company expected the Phu Kham operation to produce up to 65,000 t of copper concentrate in 2013 (PanAust Ltd., 2012, p. 9, 11).

PanAust's mineral resource interests in Laos also included the Ban Houayxai gold-silver project and the Phonsavan copper-gold project. The Ban Houayxai project, which was

completed at a cost of \$208 million, was commissioned in April 2012. Commercial production started on June 1 and the operation reached full capacity by the fourth quarter of 2012. The Ban Houayxai project, which is located approximately 25 km west of the Phu Kham copper-gold operation, was an open pit operation that produced 2,378 kg of gold and 4,564 kg of silver in 2012. The company was targeting production of approximately 3,100 kg of gold in 2013 (PanAust Ltd., 2012, p. 11, 13).

The Phonsavan copper-gold project consisted of two copper deposits named KTL and Tharkhek that are located within 5 km of each other. During 2012, the project was under a prefeasibility study, which PanAust anticipated would be completed by September 2013. The study focused on the development of an open pit mining operation with an annual processing capacity of 7 Mt and output of approximately 25,000 t/yr of copper and 622 kilograms per year of gold. The project was estimated to have a mine life of 10 years (PanAust Ltd., 2012, p.13).

Zinc.—During 2012, Padaeng Industry Public Co. Ltd. of Thailand, through its wholly owned subsidiary Padaeng Industry (Laos) Co. Ltd., announced that it had stopped exploratory work at its 400-km² zinc exploration project in Vientiane Province. The decision to stop the work was based on uncertainty regarding the company's exploration agreements with the Government (Padaeng Industry Public Co. Ltd., 2012, p. 25).

Industrial Minerals

Cement.—Cement production in Laos was projected to reach 1.5 Mt/yr by 2014. The main drivers for the increase were thought to be the infrastructure developments proposed by the Government, which included major hydroelectric plants, the development of a railway system to connect Laos with China, and the expansion of the Wattay International Airport located in Vientiane. The construction of the 420-km railway was estimated to require about 3.5 Mt of cement (Bell, 2012, p. 108).

Lao Cement Co. Ltd. planned to build its third cement plant in the town of Vang Vieng, Vientiane Province; the plant would have the capacity to produce from 0.7 to 1.0 Mt of cement and was expected to be commissioned by 2013. The new plant was being built at a projected cost of \$77 million. During 2012, Luang Prabang Cement was building its second cement factory in Nam Bark District, Luang Prabang Province. The proposed 270,000-t/yr plant had a cost of \$22 million; no estimated commission date for the plant had yet been released (Bell, 2012, p. 108).

Potash.—In 2012, Sinohydro Mining Co. (Lao) Ltd. was developing a potash mine with a production capacity of 120,000 t/yr. The company planned to start operations in 2013, and the project's mine life was estimated to be 30 years (Mining Journal, 2012b).

Outlook

Laos' accession to the WTO on February 2, 2013, is expected to enhance the country's economic development, and the increased interaction with other WTO members could

help attract investment interest from other members of the international trading community. As Laos continues to develop its infrastructure and expands its economic cooperation with other Southeast Asian countries, including by creating business ties with neighboring countries, its demand for construction materials, fertilizers, metals, and fuel minerals is expected to increase. Starting in 2013, the cement industry of Laos is expected to increase its production in order to meet the demand for the construction of the infrastructure projects proposed by the Government, which include hydroelectric plants, a railway system, and the expansion of the Wattay International Airport.

Similarly, the production of copper, gold, and silver is expected to increase starting in 2013 as major projects and expansions were commissioned in 2012, such as the Sepon copper project (which implemented productivity improvements at its facilities to increase the production of copper cathode) and PanAust's Ban Houayxai gold-silver project. Increases in the production of potash are also expected within the next few years as mines and plants that have been in the construction phase in recent years are completed.

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TABLE 1
LAOS: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2008	2009	2010	2011	2012
Antimony	--	887	530	1,456	1,042
Barite ^e	1,000 ^r	12,460 ^{r,3}	17,500 ³	2,500 ^r	21,900
Cement ^e	400,000	400,000	400,000	400,000	400,000
Clay, common	NA ^r	1,783,567 ^{r,3}	1,901,530 ^r	609,840 ^r	512,587
Coal:					
Anthracite	186,468	167,447	211,721	166,609	133,583
Lignite	379,273 ^r	466,082 ^r	501,622 ^r	511,700 ^r	578,068
Copper:					
Concentrate	24,929	54,019	67,806	59,897	63,285
Metal, refined	64,075	67,561	64,241	78,859	86,295
Gold kilograms	4,333	5,033	5,061	3,984	6,415
Gypsum	337,304 ^r	761,331 ^r	553,396 ^r	686,150 ^r	578,543
Iron ore:					
Gross weight	18,000	42,000	50,900	42,700	48,400
Fe content (62%)	11,219	26,095	31,565	26,471	30,000 ^e
Lead, mine output	2,950 ^r	2,000 ^r	2,270 ^r	2,921 ^r	4,510
Limestone	911,658 ^r	1,488,070 ^r	3,106,724 ^r	997,591 ^r	1,014,000
Potash	NA	NA	NA	NA	42,798
Salt, rock	NA	6,536 ^r	13,421 ^r	23,395 ^r	11,980
Sandstone	NA	752,781	3,695,838	339,331	1,214,668
Silicon, metal	3,026	7,350	7,768	3,001	15,281
Silver kilograms	6,700	14,726	15,788	16,738	19,181
Tin, mine output, Sn content	551 ^r	598 ^r	925 ^r	674 ^r	762
Zinc, mine output, Zn content	8,597 ^r	4,000 ^r	5,000	5,320 ^r	5,250

^eEstimated; estimated data are rounded to no more than three significant digits. ^rRevised. NA Not available. -- Zero.

¹Table includes data available through February 20, 2014.

²In addition to the commodities listed, sapphire and crude construction materials, such as sand and gravel and varieties of stone, were produced irregularly.

³Reported figure.

Sources: U.S. Geological Survey Minerals Questionnaire for Laos (2012); Pan Australian Resources Ltd., Annual Report 2009–12; Minerals and Metals Group Lane Xang Minerals Ltd. (MMG LXML) Quarterly Reports 2009–12.

TABLE 2
LAOS: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Barite		Barite Mining Co., Inthavong Mining Co., Lao Development Construction Co., Phethongkham Co., Oravan Barite Co., and Singphooufar Co.	Muongfuong and Sanakham, Vientiane Province	30,000 ¹
Cement		Lao Cement Co. Ltd., a joint venture between China Yunnan Corp. for International Techno-Economic Cooperation and Lao State Agricultural Industry Development Enterprise Imp-Exp & General Service	Vang Vieng Cement Plant No. I, Vientiane Province	100,000
Do.		do.	Vang Vieng Cement Plant No. II, Vientiane Province	240,000
Do.		Lao Cement Industry Co. Ltd	Thakhek Cement Plant, Khammouane Province	850,000
Do.		Luang Prabang Cement Co. Ltd.	Luang Prabang Cement Plant, Luang Prabang Province, 340 kilometers from Vientiane, Vientiane Province	100,000
Do.		Wanrong Cement I	Vangvieng, Vientiane Province	78,000
Do.		Wanrong Cement II (Yunnan Industrial Economic Co., 60%, and Agricultural and Forestry Development and Service Co. of Laos, 40%)	do.	200,000
Do.		Wanrong Cement III	Savannakhet Province	200,000
Do.		Zhongyayici Co.	Saravan Cement Plant, Saravan Province	450,000
Coal:				
Anthracite		Agriculture Industry Development Enterprises	do.	60,000
Lignite		Viengphoukha Coal Mine Co. Ltd.	Viengphoukha, Luangnamtha Province	300,000
Copper:				
Mined ore output, Cu content		Lane Xang Minerals Ltd. (MMG LXML) (MMG Ltd.), 90%, and Government, 10%	Sepon, Vilabouly District, Savannakhet Province	80,000
Refined		do.	do.	88,000
Do.		Phu Bia Mining Ltd. (wholly owned subsidiary of PanAust Ltd.), 90%, and Government, 10%	Phu Kham copper-gold operation located in Xaisomboun special zone, 120 kilometers north of Vientiane, Vientiane Province	65,000
Gemstone (sapphire)	carats	Bokeo Mining Co. Ltd.	Bokeo Province	300,000
Do.	do.	Buhae Industrial Corp.	Houaxay District, Bokeo Province	500,000
Do.	do.	Lao International Trade and Service	do.	400,000
Gold, mine output, Au content	kilograms	Lane Xang Minerals Ltd. (MMG LXML) (MMG Ltd.), 90%, and Government, 10%	Sepon, Vilabouly District, Savannakhet Province	7,500
Do.	do.	Phu Bia Mining Ltd. (wholly owned subsidiary of PanAust Ltd.), 90%, and Government, 10%	Phu Kham copper-gold operation located in Xaisomboun special zone, 120 kilometers north of Vientiane, Vientiane Province	2,000
Do.	do.	PanAust Ltd.	Ban Houayxai gold-silver project, located approximately 25 km west of the Phu Kham copper-gold operation	3,100
Gypsum		Lao State Gypsum Mining Co. Ltd.	Champhon District, Savannakhet Province	200,000
Do.		Mining Development Economy Cooperation (OEDCD)	Tha Kect District, Khammouane Province	150,000
Do.		Savan Gypsum Mining Co. Ltd.	Champhon District, Savannakhet Province	70,000
Do.		LAVICO Co. Ltd. (a Laos-Vietnam joint venture)	Xebangfay District, Khammouane Province	100,000
Limestone		Lao Cement Co. Ltd. (a Laos-China joint venture)	Vangvieng, Vientiane Province	250,000
Do.		Agriculture Industry Development Enterprises	do.	150,000
Do.		V.S.K. Co. Ltd.	Tha Kect District, Khammouane Province	150,000
Do.		Phanangnon Co. Ltd.	do.	100,000

See footnotes at end of table.

TABLE 2—Continued
 LAOS: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^c
Potash		SinoAgri Mineral Resources Exploration Ltd. (a joint venture between Beijing Jiang Zhi Yuan Investment Ltd. and China National Agricultural Means of Production Group Corp.)	Plant in Sakhon Nakon Basin in Khammouane Province	100,000
Do.		Laotian Potash Mining Industry Ltd. Co.	Potassium chloride plant, Vientiane Province	50,000
Silver	kilograms	Phu Bia Mining Ltd. (wholly owned subsidiary of PanAust Ltd.), 90%, and Government, 10%	Phu Kham copper-gold operation located in Xaisomboun special zone, 120 kilometers north of Vientiane, Vientiane Province	14,000
Do.	do.	PanAust Ltd.	Ban Houayxai gold-silver project located approximately 25 km west of the Phu Kham copper-gold operation	20,000
Tin, mine output, Sn content		Lao-North Korea Tin Mines	Hinbounne District, Khammouane Province	120
Do.		S V Mining Co. Ltd.	do.	300
Zinc, mine output, Zn content		Padaeng Industry Public (Laos) Co. Ltd. [Majority interest owned by Padaeng Industry (Public) Co. Ltd., and minority interest owned by the Government]	Kaiso, Vangvieng, Vientiane Province	5,000

^cEstimated. Do., do. Ditto.

¹Estimated combined capacity of the six local barite mining companies.