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The Mineral Industry of Thailand

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In 2007, Thailand produced copper, gold, iron and steel, lead, manganese, silver, tantalum, tin, tungsten, and zinc metals. The country also produced industrial minerals, such as barite, cement, clay, diatomite, feldspar, fluorspar, gemstones, gypsum, perlite, phosphate rock, salt, sand, stones, talc, and zirconium, and mineral fuels, including coal, natural gas, and petroleum (table 1).

Minerals in the National Economy

Thailand's gross domestic product (GDP) in 2007 was $246 billion, and the annual GDP growth rate was 4.9%. The mineral sector played a significant role in Thailand's economy, especially the processing and export of mineral commodities (U.S. Department of State, 2009).

Thailand's economy was export dependent, with the export of goods and services accounting for more than 70% of the GDP. In 2007, the economy relied heavily on resilient export growth, which totaled about 17% for the year. Thailand's recovery from the Asia financial crisis of the 1990s was owing to external demand from the United States and other foreign markets (U.S. Department of State, 2009).

Government Policies and Programs

Thailand adopted its current Constitution following multiparty elections that were held in December 2007 (U.S. Department of State, 2009). The Ministry of Industry is the principal Government agency that oversees the country's mining sector; the Ministry's Department of Primary Industry and Mines (DPI&M) administers the Minerals Act and issues ministerial regulations. The DPI&M also provides technical assistance for metallurgical activities, mineral processing, and mining. The Department of Mineral Resources (DMR) drafts national mineral policies and provides technical assistance for geologic prospecting and mineral exploration (Department of Mineral Resources, 2004).

Production

In 2007, Thailand's mineral sector had both significant decreases and large increases in production. The country, for example, produced 271 metric tons (t) of antimony metal, which was a decrease of 50% from the 544 t produced in 2006. Refined copper production decreased by 53% to 12,714 t from 27,050 t in 2006; tantalum metal and oxide powder, by 38.8% to 142 t from 230 t; silver, by 37.3% to 7,400 kilograms (kg) from a revised 11,800 kg; and gold, by 30% to 3,000 kg from 4,300 kg. Tin concentrate (Sn content) production decreased by 36%, tin concentrate production decreased by 33.8%, and tin metal production decreased by 16.1%. Production of zinc ore (gross weight) decreased by 17.7%, and that of zinc metal decreased by 1.4%.

Among the industrial minerals, production of perlite decreased by 70.9%; that of ball clay and fluorspar, by 43.8% each; feldspar, by 35.9%; cement (hydraulic), by 9.5%; and diatomite, by 6.3%. Production of marl and shale for cement manufacture decreased by only 53.8% and 14.7%, respectively; production of talc decreased by 19.8% (table 1).

Crude steel production, however, increased by about 5% to 5.47 million metric tons (Mt). Production of steel products increased by about 5% to 10.659 Mt from 10.134 Mt in 2006. Production of iron ore (gross weight) increased by 488% to 1,554,860 t from 264,289 t, and the estimated iron content of the ore increased to 779,000 t from 132,000 t. In addition, production of tungsten (gross weight) increased by 50.7% to 823 t from 546 t in 2006, and that of lead metal increased by 19.6% to 73,159 t from 61,160 t.

Among the industrial minerals, production of phosphate rock increased by 294.4% to 3,550 t from 900 t in 2006, and production of gemstones, granite dimension stone, dolomite, granite industrial rock, limestone dimension stone, and salt rock increased by 27.7%, 26.4%, 24.9%, 16.5%, 15.9%, and 12.6%, respectively. Marble production, which included dimension stone and fragments, increased by 55% to 848,806 t from 547,582 t in 2006. Among the mineral fuels, kerosene production increased by 20.2% (table 1).

Mineral Trade

A portion of Thailand's mineral production was exported, including antimony, barite, cement, copper, feldspar, fluorspar, gemstones, gold, gypsum, iron ore, limestone, refined petroleum products, rock salt, steel products, tungsten, refined tin, and zinc. Thailand was a net importer of mineral commodities, mainly coal, natural gas, crude petroleum, steel products, and steel scrap (Bank of Thailand, 2007).

In 2007, Thailand's exports to the United States were valued at $22.8 billion compared with about $22.5 billion in 2006 and $19.9 billion in 2005. Of these exports, about $337 million was crude petroleum; about $307 million was other gemstone (precious, semiprecious, and imitation); about $166 million was iron and steel mill products (semifinished); and about $122 million was iron and steel products (U.S. Census Bureau, 2008b).

Imports from the United States were valued at $8.5 billion in 2007 compared with about $8.1 billion in 2006 and $7.3 billion in 2005. These imports included nearly $253 million in steelmaking materials; $140 million in other petroleum products; and $134 million in gem diamond (U.S. Census Bureau, 2008a).

Structure of the Mineral Industry

Thailand's mineral industry consisted of an industrial mineral mining and processing sector and a ferrous and nonferrous

metals mining and processing sector. The energy sector, which included the exploration and production of coal (lignite), natural gas, and crude petroleum, was a growing sector.

The Electricity Generating Authority of Thailand (EGAT) and several coal mining companies owned and operated most of the county's major coal exploration and mining businesses. The Petroleum Authority of Thailand, PTT Exploration and Production Public Company Ltd. (PTTEP), joint ventures of PTTEP, and major multinational oil companies owned most of the country's oil and gas exploration and exploitation businesses. Private companies in Thailand owned and operated most of the nonfuel minerals mining and mineral processing businesses.

Commodity Review

Metals

Copper.—The Puthep copper project was a joint venture between Padaeng Industry Public Company Ltd. of Thailand and Pan Australian Resources Ltd. (PAR) of Australia. PAR had a 20.66% interest and was eligible to earn up to a 60% interest, and Padaeng Industry Public Company owned the remaining interest (79.34%). The Puthep copper project comprises the PUT 1 and PUT 2 deposits, which are located 14 kilometers (km) apart and about 20 km southeast of Loei, which is the capital of Loei Province, in northern Thailand. In early 2007, the two companies moved forward with a feasibility study of the PUT 1 deposit; the study was expected to be completed in the first half of 2009. The feasibility study reportedly would be conducted in two phases. In the first phase, infill and extensional resource drilling would be undertaken and the results would be used to test the overall economic potential of the project. The second phase would depend upon the positive results of the first phase. Drilling at PUT 1 had indicated the presence of broad zones of primary mineralization below the transitional mineral resource. The joint venture's goal was to complete a feasibility study to support the development of an operation with a capacity to process 10 to 12 million metric tons per year (Mt/yr) of ore to produce 50,000 metric tons per year (t/yr) of copper. PanAust would receive an equity share of at least 30,000 t of concentrate (Pan Australian Resources Ltd., 2006, p. 9, 17; Padaeng Industry Public Company Ltd., 2007, p. 14, 26; PanAust Ltd., 2008).

Gold.—Amanta Resources Ltd. of Canada, continued its initial drilling program of up to 5,000 meter (m) at the Langu property through the first quarter of 2007.

Kingsgate Consolidated Ltd. (Kingsgate) of Australia owned and operated the low-cost Chatree gold mine in central Thailand through its wholly owned subsidiary Akara Mining Ltd. The Chatree gold mine is located 280 km north of Bangkok. Gold production from the Chatree Mine for fiscal year 2007-08 (which ended on June 30) was 2,102 kg (reported as 74,137 troy ounces); this was 0.3% lower than the previous forecast of 2,109 kg (reported as 74,379 troy ounces). The total cash cost was $457 per troy ounce, which was slightly above the previous year's cost of $440 per troy ounce and 6.6% higher than the previous forecast of $429 per troy ounce; the increase was mainly owing to higher royalties. The company's annual gold sales were 2,075 kg (reported as 73,202 troy ounces), which was 2.9% higher than the previous forecast of 2,016 kg (reported as 71,105 troy ounces). The grade of the ore feed to the plant averaged 1.1 grams per metric ton (g/t) gold for the full year, which was slightly below the previous year's grade of 1.2 g/t gold. The processing plant marginally exceeded the previous year's throughput rate, achieving 2.5 Mt for the year (Kingsgate Consolidated Ltd., 2008; Minesite.com, 2008).

Iron Ore and Iron and Steel.—Thailand's crude steel production increased by about 5% to an estimated 5.47 Mt in 2007 from 5.21 Mt in 2006. Domestic demand for steel remained weak in 2007 mainly owing to slowed economic growth and volatile world oil prices and despite the country's steady real estate construction activity and increased demand for steel by the automobile industry. Thailand's reported mine production of iron ore increased by 488% to 1,554,860 t in 2007 compared with 264,289 t in 2006, which was a huge increase (table 1).

P.T.K. Mining Company Ltd. (P.T.K.) was authorized by the Siam Iron and Steel Company, Ltd. to construct an iron ore mine and build a processing plant to mine and process iron ore at the Phu Ang iron ore deposit in Loei Province. The DPI&M had granted Siam Iron and Steel a 25-year mining right (from 2005 to 2030) for two mining concessions at the Phu Ang deposit. The total production for the first 3 months at this processing plant was projected to be at least 50,000 t, and to be 60,000 metric tons per month (t/mo) thereafter. The reserves at the Phu Ang Mine were estimated to be 10.9 Mt; the rated capacity was 720,000 t/yr, and the ore grade averaged about 65.9% iron (P.T.K. Mining Company Ltd., 2008).

Thailand's major infrastructure projects were awaiting the new Government's final spending decision. According to a forecast by Thailand's Kasikorn Research Center, domestic demand for steel would be between 13 Mt and 14 Mt in 2007 compared with between 12 Mt and 13 Mt in 2006 and 13.8 Mt in 2005 (Steel Business Briefing, 2007).

Thailand Tinplate Manufacturing Co. opened a new electrolytic tinning line at its plant in Samut Prakan. This new fourth line would increase the company's tinplate production capacity by 150,000 t/yr and raise the total production capacity for tinplate and tin-free steel to 516,000 t/yr. Thailand's total annual demand was 600,000 t (TIN World, 2007).

Tin.—Thailand Smelting and Refining Co., Ltd. (Thaisarco), which was based in Thailand, produced 19,826 t of refined tin compared with 27,828 t in 2006. This was a decrease of 28.8%.

Tongkah Harbour Public Company Ltd. temporarily stopped tin mining operations in Phuket Bay and kept its offshore tin mining operations on hold (pending results of negotiations with the Government) until October 2007, when the Government reduced the tin royalty rate. During 2007, Tongkah Harbour Public Company brought in appropriate mining equipment and expertise, applied for a mining license, and drafted a mining plan to exploit a deposit by a subsidiary company—Sea Mineral Ltd. (SML)—which had a deposit with proven reserves of some 60,000 t of tin ore at a cutoff grade of 0.10 kilogram per cubic meter (Tongkah Harbour Public Company Ltd., 2007).

Tungsten.—In 2007, initial exploration activities at Amanta Resources' Mae Lama tungsten prospect continued to move forward. The company began a 10-hole core drilling, mapping, and sampling program at the mine to examine the previously

reported grade of the tungsten mineralization within the main 'Mae Lama' quartz vein (Amanta Resources Ltd., 2007).

Zinc.—The zinc deposit at the Mae Sot District of Tak Province continued to be exploited by Padaeng Industry Company, Ltd. (PDI). As of the beginning of 2007, according to PDI, the remaining mineral resource at the Mae Sot Mine was estimated to be 4.283 Mt at a grade of 9.2% zinc, of which 1.206 Mt at a grade of 9.3% zinc was measured resource, 2.982 Mt at a grade of 9.2% zinc was indicated resource, and 95,000 t of mined low-grade ore at a grade of 8.4% zinc was stockpiled at the mine site. Ore reserves, which had been updated using a mining cutoff grade of 3% zinc, were estimated to be 3.675 Mt at a grade of 9.1% zinc. According to the company, these ore reserves were sufficient for 8 more years of mining at the 2006 production rate of 536,000 t/yr. Additionally, the zinc sulfide mineral resources at the Hualon deposit of the Mae Sot Mine were estimated to be 295,000 t at a grade of 6.0% zinc plus 44,000 t of secondary zinc mineral resources at a grade of 7.1% zinc. Mineral resources at the Hualon deposit had not been mined since 2000 (Padaeng Industry Public Company Ltd., 2007, p. 9-11).

PDI had conducted a diamond drilling program in the Mae Sot area during the past 2 years and, according to the company, every hole intersected zinc silicate mineralization. The best hole intersected 22.7 m of high-grade zinc mineralization at a grade of 33.2% zinc between zero and 22.7 m depth (Padaeng Industry Public Company Ltd., 2007, p. 12-14). PDI estimated that the world zinc supply and demand in 2007 mine production was 11.18 Mt; metal production was 11.32 Mt; and metal consumption was 11.38 Mt. Local sales of zinc and Thailand's total zinc consumption for the year were 107,000 t and 86,000 t, respectively (Padaeng Industry Public Company Ltd., 2008).

Industrial Minerals

Cement.—In 2007, Thailand cement production decreased by 9.5% to 35.668 Mt owing to a decrease in domestic demand by the construction industry. Demand was weaker in 2007 than in 2006 mainly because of delays and scale-backs in major infrastructure projects, such as Bangkok's light-rail mass transit system, and because of the saturated housing market (Katharangsiporn, 2007).

Potash.—The mining of potash was primarily for the production of potassium fertilizer (93% of potash is used in fertilizer). Thailand imported between 400,000 and 455,000 t/yr of potash for chemical fertilizer production.

Italian-Thai Development Plc (ITD) planned to earmark about $3.6 million[1] [12 billion Thai baht (Bt)] to develop a potash mine. The company acquired a potash mining concession and business in the Province of Udon Thani from the Asia Pacific Potash Corp. (APPC) in 2006. ITD expected to produce a total of about 45 Mt of potash in the remaining 22 years of the concession. The company planned to produce 1 Mt of potash annually in an initial period and to increase production to 2 Mt in the fifth year of operation. The Udon Thani potash deposit reportedly contained about 225 Mt of sylvinite (Praiwan, 2007).

[1]Values have been converted from Thai baht (Bt) to U.S. dollars ($) at a rate of Bt 33.125 = US$1.00 for 2007.

Mineral Fuels

Coal.—Coal was an important component of Thailand's energy supply. In 2007, coal (lignite) production decreased by 4.4% to 18.239 Mt from 19.071 Mt in 2006.

EGAT, which was Thailand's leading energy utility, invested $6 billion to build the country's first nuclear powerplant. The nuclear plant would produce 4,000 megawatts of electricity as part of the nation's long-term energy plan to cope with looming power shortages. Thailand currently relied on natural gas for 70% of its electricity generation; the remainder was supplied by coal, hydropower, and oil (Forbes.com, 2007).

Natural Gas and Petroleum.—One-third of the natural gas consumed in Thailand was imported, mainly from neighboring Burma (Myanmar). At yearend 2006, Thailand had two major natural gas pipelines that linked the offshore fields in the Pattani Basin (Gulf of Thailand) to Rayong Province; they had a combined capacity of about 75 million cubic meters per day. PTT Public Company Ltd. (Thailand's national oil and gas company) had more than 3,701 km (2,300 miles) of total natural gas transmission pipelines throughout the country (U.S. Energy Information Administration, 2007).

The country completed the first phase of its $1 billion, third gas-transmission line in June 2007, and the pipeline began commercial operations. The 424 km of offshore and 110 km of onshore pipeline delivered about 7.1 million cubic meters per day of gas from Chevron Corp's Erawan gasfield in the Gulf of Thailand to Bang Pakong (a district in the western part of Chachoengsao Province, central Thailand), east of Bangkok, via Rayong. Additional pipelines from the new Arthit project, which was located off the coast of Songkhla about 350 miles south of Bangkok, would connect to the third gas-transmission pipeline. The pipeline was expected to have an initial capacity to handle about 19.8 million cubic meters in 2007; however, the pipeline would run at only 60% of its originally scheduled capacity. PTT's goal was to run the pipeline at its full capacity of about 53.8 million cubic meters per day beginning in 2010 (U.S. Energy Information Administration, 2007).

PTT LNG Company Ltd. (PTTLNG) studied the feasibility of building a liquefied natural gas import, regassification, and storage terminal in Thailand. PTTLNG evaluated the establishment of a 5 Mt/yr (244 billion cubic feet per year) facility at Map Ta Phut in Rayong. PTT also considered the construction of a fourth major pipeline to deliver regasified natural gas from Map Ta Phut to domestic end users (U.S. Energy Information Administration, 2007).

Outlook

According to the Fiscal Policy Office (FPO) of the Ministry of Finance, the Thai economy in 2008 was projected to grow at a rate of 5.6% (in the range of between 5.0% and 6.0%), which would be an improvement from the 4.9% growth in 2007. Economic expansion in 2008 was expected to be more balanced owing to a recovery in domestic demand that was expected to result from the Government's plan to accelerate public sector spending. The intent would be to stimulate the domestic economy at a time when external demand was likely to be softened from a possible global economic slowdown.

The external demand in 2008 was expected to grow at a slower pace. The export volume of goods and services was expected to increase by 6.9% (in the range of between 6.5% and 7.5%) compared with 7.1% in 2007 and to continue to expand at a moderate pace because of Thailand's export sector's diversification into new and emerging markets. The import volume of goods and services in 2008 was projected to increase at an accelerated pace of 10.3% (in the range of between 9.8% and 10.8%) compared with 3.5% in 2007, in line with the recovery of domestic demand.

The FPO also forecast that the external economic stability in 2008 was likely to remain resilient whereas internal economic stability might be at some risk from higher inflationary pressure. Headline inflation in 2008 was projected to increase to 4.5% (in the range of between 4.3% and 4.8%) because of increasing prices of energy and other commodities on the world markets (Ministry of Finance, 2008).

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TABLE 1
THAILAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2003	2004	2005	2006	2007
METALS						
Antimony:						
Ore:						
Gross weight		83	110	735 r	2,980	--
Sb content		38	52	347 r	1,409	--
Metal, smelter		12	2	460	544	271
Copper, metal, refined:						
Primary e		--	18,100 2	13,700 r	25,300 r	11,900
Secondary e		--	1,900 2	2,100 r	1,750 r	814
Total		--	20,000	15,800 r	27,050 r	12,714
Gold	kilograms	4,269	4,500	4,400	4,300 r	3,000
Iron and steel:						
Iron ore:						
Gross weight		9,675	135,580	230,946	264,289	1,554,860
Fe content e		4,800	68,000	116,000	132,000	779,000
Crude steel	thousand metric tons	3,572	4,533	5,161	5,210 r	5,470 e
Steel products	do.	10,236	12,185	11,617	10,134	10,659
Lead, metal, refined, secondary		45,300	57,500	61,100	61,160	73,159
Manganese ore:						
Metallurgical-grade, gross weight, 46% to 50% MnO_2		--	4,550	88,500	-- r	5,500
Mn content e		--	2,180	42,400	-- r	2,750
Silver	kilograms	12,496	10,700	14,100	11,800 r	7,400
Tantalum, metal and oxide powder		168	317	150	230	142
Tin:						
Concentrate:						
Gross weight		980	724	188	225	149
Sn content		793	586	158 e	190 e	122
Metal, primary		15,400	20,800	31,600	27,540	23,104
Tungsten concentrate:						
Gross weight		390	337	622	546	823
W content e		206 r	187 r	345 r	303 r	452
Zinc:						
Ore:						
Gross weight		148,297	199,477	203,810	214,023	176,042
Zn content e		37,100	43,400	30,572 2	32,100	32,921 2
Metal, primary		69,600	68,300	60,866	67,767	66,849
Alloy, Zn content		44,086	46,800	40,320	28,702	28,597
INDUSTRIAL MINERALS						
Barite		113,686 r	115,100 r	101,186 r	96,469 r	98,877
Cement, hydraulic	thousand metric tons	32,530	35,626	37,872	39,408	35,668
Clays:						
Ball clay		579,404	610,193	393,935	1,003,267	563,353
Kaolin, marketable:						
Beneficiated, washed		184,562	200,671	156,853	157,900	159,186
Nonbeneficiated, unwashed		373,811	430,364	580,376	675,886	519,673
Filler		950	--	9,031	9,326	7,985
Diatomite		1,288	1,372	990	1,344	1,260
Feldspar		824,990	1,001,053	1,149,717	1,067,684	684,668
Fluorspar, crude, metallurgical-grade		2,368	2,375	295	3,240	1,820
Gemstones	thousand carats	716	911	699	81	102
Gypsum	thousand metic tons	7,291	7,169 r	7,113	8,355	8,643
Perlite		5,700	6,000 e	5,500 e	22,000 r	6,400
Phosphate rock, crude		13,870	2,580	3,020	900	3,550
Salt:						
Rock		892,243	1,031,200	1,074,214	1,008,251	1,134,931
Other e		100,000	100,000	100,000	100,000	100,000
Sand, silica, glass		1,293,929	587,655	718,320	861,847	844,071

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity		2003	2004	2005	2006	2007
INDUSTRIAL MINERALS—Continued						
Stone:						
Calcite		232,025	436,628	692,850	625,950	672,580
Dolomite		865,708	992,907	795,466	899,512	1,123,425
Granite:						
Dimension stone	cubic meters	9,866	10,000 e	9,500 e	8,321 r	10,515
Industrial rock	thousand metric tons	3,107	3,500 e	3,000 e	4,463 r	5,199
Limestone:						
Dimension stone	do.	--	--	--	201	233
For cement manufacture only	do.	46,868	63,196	55,584	61,583	63,799
Construction and other uses	do.	66,073	70,000	75,000 e	87,887 r	87,402
Marble, dimension stone and fragment	cubic meters	339,166	236,643	267,797	547,582	848,806
Marl for cement manufacture only		80,405	184,750	196,500	68,700	31,750
Quartz		65,559	19,216	2,604	2,897	4,924
Shale for cement manufacture only	thousand metric tons	2,982	3,622	3,695	5,590	4,769
Travertine		--	--	--	3,316	3,490
Talc and related materials:						
Pyrophyllite		73,556	108,691	177,684	131,843	415,420
Talc		8,501	12,592	10,270	4,374	3,508
Zirconium		--	--	--	--	1,023
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite	thousand metric tons	18,830	20,038	21,429	19,071 r	18,239
Natural gas, gross production	million cubic meters	21,674	22,360	23,689	24,317	25,400
Petroleum:						
Crude	thousand 42-gallon barrels	35,158	31,299	41,570	47,067	49,078
Natural gas condensate	do.	22,872	24,963	25,363	27,466	28,724
Refinery products:						
Liquefied petroleum gas	do.	38,872	41,520	45,241	45,475	47,880
Gasoline	do.	54,342	56,339	58,072	57,172	58,589
Jet fuel	do.	26,778	29,127	30,421	35,240	37,021
Kerosene	do.	4,386	7,041	6,395	6,548	7,868
Distillate fuel oil	do.	38,248	42,277	38,740	39,681	40,305
Residual fuel oil[e]	do.	23,000	24,000	25,000	26,000	27,109 [2]
Unspecified[e, 3]	do.	3,500	3,600	3,600	3,600	3,626 [2]
Total[e, 4]	do.	189,000	204,000	207,000	214,000	222,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.
[1]Table includes data available through September 27, 2008.
[2]Reported figure.
[3]Includes refinery fuel and refinery gains or losses.
[4]Data are rounded to no more than three significant digits; may not add to totals shown.

Sources: Department of Mineral Resources, Mineral Statistics of Thailand; Department of Primary Industries and Mines; Ministry of Energy, Energy Policy and Planning Office; and U.S. Geological Survey Minerals Questionnaires, 2003-07.

TABLE 2
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Barite		Asian Mineral Resources Company Ltd.	Loei, Mae Hong Son, Nakhon Si Thammarat, and Satun Provinces	60
Do.		P&S Barite Mining Company Ltd.	Loei and Nakhon Si Thammarat Province	60
Cement		Asia Cement Company Ltd.	Pra Phutthabath, Saraburi Province	4,800
Do.		Jalaprathan Cement Company Ltd. (Cement Francais S.A., 37%; Veatprapat Holding Company Ltd., 19%; others, 44%)	Takli, Nakhorn, Sawarn Province; and Cha-Am, Petchburi Province	2,350
Do.		Samukee Cement Ltd.	Pakchong, Nakhon Ratchasima Province	125
Do.		Saraburi Cement Company Ltd. (CEMEX Asia Holdings Ltd., 99%)	Chalerm Phrakiat, Saraburi Province	700
Do.		Siam Cement Industry Company Ltd. (Bureau of the Crown Property, 30%; Thai Security Depository Company Ltd., 6.94%; CPB Equity Company Ltd., 5.6%; other financial institutions and the general public, 57.46%)	Kaeng Khoi, Phabhudhabat, and Khao Wong, Saraburi Province; Chae hom, Lampang Province; Thung Song, Thammarat Province; and Ta Luang, Ayutthaya Province	23,200
Do.		Siam City Cement Company Ltd. (Holcim Ltd., 33.7%; Rattanarak family, 27%; others, 39.3%)	Kaeng Khoi, Saraburi Province	14,500
Do.		TPI Polene Company Ltd.	Kaeng Khoi, Saraburi Province	9,900
Coal, lignite		Electricity Generating Authority of Thailand	Mae Moh, Lampang Province	20,000
Do.		Banpu Public Company Ltd.	Lampang (LP-2), Lampang Province and Chiang Muan, Phayao Province	3,400
Do.		Lanna Lignite Public Company Ltd.	Ban Pakha, Lamphun Province	1,000
Copper, refined		Thai Copper Industries Plc (Thai Asset Management, 36%; Thai Film Industry, 27%; Aker Kvarmer, 28%; Industrial Corporation of Thailand Plc, 7%; others, 2%)	Rayong, Rayong Province	165
Feldspar, concentrate		Asia Mineral Processing Company Ltd.	Provinces of Nakhon Si Thammarat and Trang	500
Fluorspar, concentrate		Asian Mineral Resources Company Ltd.	Mae Hong Son Province	14
Gas, natural	million cubic meters per day	Esso Exploration and Production Khorat Inc.	Namphong, Khon Kaen Province	4
Do.	do.	TOTAL Exploration and Production (Thailand)	Bongkot in the Gulf of Thailand	15
Do.	do.	Unocal Thailand Ltd.	Baanpot, Erawan, Funan, Kaphong, Pladang, Satun, Pailin, Trat, all in the Gulf of Thailand	33
Gold	kilograms	Akara Mining Ltd. (Kingsgate Consolidated N.L. of Australia, 100%)	Chatree, Phichit Province	5,000
Gypsum		Thai Gysum Products PCL. (Thaigips Holdings Ltd., 40.75%; BPB Gypsum B.V., 30%; others, 29.25%)	Nong Bau, Nakhon Sawan Province and Ban Munnak, Phichit Province	2,000
Do.		Vanich Gypsum Company Ltd.	Khlong Prab, Mai Riang. Thoong Yai Mai in Provinces of Nakhon Si Thammarat and Surat Thani	2,000
Iron ore, gross weight		P.T.K. Mining Company Ltd.	Phu Ang, Loei Province	720
Lead, in concentrate		Kanchanaburi Exploration and Mining Company Ltd.	Song Toh, Nong Phai, and Bo Ngam in Kanchanaburi Province	30
Petroleum, crude, including condensate	thousand 42-gallon barrels per day	Chevron Offshore (Thailand) Ltd.	Benjamas, Tantawan, offshore in the Gulf of Thailand	35
Do.	do.	PTT Exploration and Production Public Company Ltd.	Sirikit in Kamphaenghet Province	24
Do.	do.	TOTAL Exploration and Production (Thailand)	Bongkot, offshore in the Gulf of Thailand	12
Do.	do.	Unocal Thailand Ltd.	Baanpot, Erawan, Funan, Gomin, Jakrawan, Kaphong, Pailin, Platon, Satun, Surat, Trat Plamuk, offshore in the Gulf of Thailand	38
Steel, rolled		The Bangkok Iron and Steel Works Company Ltd.	Phrapradaeng, Samutprakarn Province	120
Do.		Bangkok Steel Industry Public Company Ltd.	do.	300
Do.		Tata Steel (Thailand) Plc (Tata Steel Ltd., 67.11%; McDonald Investment, 6.5%; others, 26.39%)	Map Ta Phut, Rayong Province; Sriracha, Chonburi Province; Ban Mon, Saraburi Province	1,700
Do.		Namheng Steel Company Ltd.	Lopburi Province	300
Do.		Sahaviriya Group Corp. Ltd.	Bang Saphan, Prachuap Khiri Khan Province	2,400
Do.		Siam United Steel Company Ltd.	Rayong Province	1,000
Do.		G-Steel Plc (formerly Siam Strip Mill Plc)	Map Ta Phut, Rayong Province	600

See footnote at end of table.

TABLE 2—Continued
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2007

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Tantalum, metal powder and oxides	metric tons	H.C. Starck (Thailand) Company Ltd. (H.C. Starck GmbH, 94.98%, and others, 5.02%)	do.	250
Tin:				
Concentrate		Numerous small companies	Nakhon Si Thammarat, Phangnga, Phuket, and Rayong Provinces	3
Refined		Thailand Smelting and Refining Company Ltd. (Thaisarco) (Amalgamated Metal Corp., 75.25%, and other, 24.75%)	Phuket, Phuket Province	30
Tungsten, in concentrate	metric tons	SC Mining Company Ltd. (Som Chai family, 100%)	Ban Pin, Chiang Mai Province	650
Zinc:				
In concentrate		Padaeng Industry Public Company Ltd. (Umicore SA, 44.77%; Ministry of Finance, 13.81%; others, 41.42%)	Mae Sot, Tak Province	65
Refined		do.	Tak, Tak Province	115

Do., do. Ditto.