



2009 Minerals Yearbook

THAILAND

THE MINERAL INDUSTRY OF THAILAND

By Lin Shi

In 2009, Thailand's mineral sector produced cement, crude oil, gold, iron and steel, petrochemicals, precious stones, silver, and other metal ores and metal waste scrap (U.S. Department of State, 2010). The country remained one of the world's leading producers of cement, feldspar, gypsum, and tin (Carlin, 2010; Cordier, 2010; Crangle, 2010; van Oss, 2010).

Minerals in the National Economy

The 2009 gross domestic product (GDP) of Thailand was about \$264 billion and had a negative annual growth rate of 2.3%. The Thai economy was export dependent; the value of exports of goods and services accounted for more than 60% of the GDP in 2009. The global financial crisis in 2008 and domestic political uncertainty (for example, the red-shirt movement in Bangkok) weakened Thailand's economic growth by reducing domestic and international demand for both goods and services. In 2009, the domestic economic contraction continued, and the Thai Government introduced two nonbudgetary stimulus packages worth \$43.4 billion to boost the economy (U.S. Department of State, 2010).

Government Policies and Programs

The Government's 2009 nonbudgetary stimulus packages focused on key sectors, including energy, irrigation, and mass transit and transportation (U.S. Department of State, 2010). 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 (DPIM) administers the Minerals Act and issues ministerial regulations. The DPIM also provides technical assistance to the metallurgical, mineral processing, and mining industries. The Department of Mineral Resources drafts national mineral policies and provides technical assistance for geologic prospecting and mineral exploration (Department of Mineral Resources, 2010).

Structure of the Mineral Industry

Thailand's mining sector mined and processed metallic (including ferrous and nonferrous) ores and industrial minerals. The Thai energy sector explored and produced coal (lignite), crude oil, and natural gas. The Electricity Generating Authority of Thailand (EGAT) and several coal mining companies owned and operated most of the country'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 petroleum and natural gas exploration projects and exploitation businesses. Most of the nonfuel minerals mining and mineral processing companies in Thailand were privately owned and operated (table 2).

Mineral Trade

Thailand is a member of the World Trade Organization, and owing to the global economic crisis, exports in 2009 decreased by 14% compared with those of 2008. The United States remained Thailand's leading single-country export market and the third-ranked supplier (of all goods) after Japan and China. Thailand's traditional major markets have been Association of Southeast Asian Nations (ASEAN) member countries (Indonesia, Malaysia, the Philippines, Singapore, and Vietnam), Europe, Japan, and the United States. Growing export markets include Australia, China (including Hong Kong), India, the Middle East, and South Africa. Thailand's exports in 2009 were valued at \$150.7 billion and included iron and steel and their products, jewelry and precious stones, refined fuels, and rubber and rubber products; imports were valued at \$131.4 billion and included gold and silver and jewelry made from them, steel products, and other metal ores and scraps (U.S. Department of State, 2010).

Production

In 2009, production by Thailand's mineral sector (including mineral fuels) decreased by 1% compared with that of 2008, and production by the manufacturing sector decreased by 5.1%. Production of some metals increased significantly in 2009, such as antimony, gold, silver, and zinc. Production of steel bar and shaped steel decreased by 31% to 1,400,800 metric tons (t) from 2,029,100 t in 2008, and that of mined tin decreased by 28.8% to 153 t from 215 t in 2008. Production of cement, clinker, crude oil, hot- and cold-steel sheet, and natural gas all decreased in 2009 compared with that of 2008 (Bank of Thailand, 2010a, b).

Commodity Review

Metals

Antimony.—Thailand's antimony (Sb content) mine production reached the highest level in the 1970s, and still was ranked among the 10 leading world antimony producers in the early 1990s. Production declined sharply to its lowest point in 2002 owing to the fluctuation in the price of antimony and the market demand. Beginning in 2004, Thailand's mined antimony ore production and antimony metal production started to rebound, and in 2006, production increased by 295% and 18%, respectively, from that of 2005. In 2009, the country reported antimony metal production of 555 t, which was a 31.5% increase from the 422 t produced in 2008, and more than a 100% increase from the 271 t produced in 2007. The reason for the increase was a relatively stabilized antimony price. Future Thai antimony production will be dependent upon global market demand (tables 1, 2).

Copper.—PanAust Ltd. (formerly Pan Australian Resources Ltd. of Australia—the company changed its name in May 2008) continued to explore for minerals in Thailand. Thailand-registered Puthep Co. Ltd. (Puthep) carried out the Puthep copper project, which was a joint venture between PanAust and Padaeng Industry Public Co. Ltd. of Thailand; the project comprised the PUT 1 and PUT 2 deposits in northern Thailand. The two deposits are located 14 kilometers apart. PanAust was undertaking a feasibility study of the PUT 1 deposit, which was Thailand's largest known copper deposit. In May 2009, PanAust released a feasibility study mineral resource estimate (total combined measured, indicated, and inferred resources) for PUT 1 of about 160 million metric tons (Mt) grading about 0.53% copper with a cutoff grade of 0.3%, and about 0.09% gold, or about 0.13 gram per metric ton (g/t). A revised mineral resource estimate was adopted for feasibility mining and engineering studies, which progressed through the year. The feasibility study considered the development of a copper vat-leach operation to process the predominantly chalcocite copper mineralization, and the objective of the feasibility study was to define sufficient copper-gold ore reserves capable of supporting a conventional bulk flotation operation. PanAust confirmed the presence of high-grade near-surface zones of copper mineralization, including an intersection of 44 meters (m) at 3% copper from a depth of 18 m. PanAust was targeting a project with an annual production of 25,000 to 30,000 t (the PanAust equity share) of cathode copper (in concentrate) for an 8-year mine life. Preliminary locked-cycle flotation test results indicated that, for the Puthep copper project, copper recovery rates would be in the range of 68% to 88% for the transitional mineralization (approximately 60% of the resource) and more than 90% for the primary mineralization (approximately 32% of the resource). Through its wholly owned subsidiary PNA Pty Ltd., PanAust held a shareholding interest of 49% in Puthep in 2009, which was up from 33.17% in 2008, and Padaeng owned the other 51%, which was down from 66.83% in 2008. PanAust could earn 51% interest in Puthep by completing a feasibility study of the Puthep copper project, and the company had options to further increase its interest to a total of 60% or 70%. Under the Thailand-Australia Free Trade Agreement, the Government of Thailand has a right to acquire 10% interest; therefore, to exercise the right to a 70% holding, PanAust would need to obtain the approval of the Thai Government (PanAust Ltd., 2010).

Thai Copper Industries Public Co. Ltd.'s copper smelter closed in 2007, and no copper production was reported by the company in 2009. Thailand Oriental Copper Co. Ltd. fabricated copper products (alloy, anode, busbar, and tape) from imported or secondary copper metal. The company's production capacity of copper products in 2007 reached 23,000 t, and the company was expanding its factory facility in 2009 to increase the production capacity to 40,000 t by 2010 (Oriental Copper Co., Ltd., 2010).

Gold.—In the last quarter of 2009, Kingsgate Consolidated Ltd. of Australia increased its gold production in Thailand. The company produced more than 1,244 kilograms (kg) of gold from its Chatree project, which is located north of Bangkok, and the company planned to produce between 3,732 kg and 4,354 kg of gold from the project by June 2010. Kingsgate had identified the Suwan gold deposit as a potential source of feed for its ore

processing plant. The deposit is located 10 kilometers north of Chatree, and the company was researching the project's feasibility for development (Australia's Paydirt, 2010).

Iron and Steel.—Thailand's steel market was affected by a number of factors during 2009, including a reduction in demand by the steel consuming industries and destocking by steel traders and steel users. Crude steel production declined by 30% to 3.6 Mt from 5.2 Mt in 2008, and the country's apparent steel consumption declined by 21% to 10.7 Mt from 13.5 Mt in 2008. Imports of finished steel decreased by 37% to 5.18 Mt in 2008, and exports of finished steel decreased by 39% to 1.37 Mt in 2008. The number of newly completed housing units in Bangkok increased by 10% in 2009; total car production by the automotive sector decreased by 28%; production of air conditioners, washing machines, and refrigerators decreased by 32%, 12%, and 8%, respectively; and the production of canned pineapple decreased by 16% (South East Asia Iron and Steel Institute, 2010, p. 38).

Tin.—Because Thailand-based Thailand Smelting and Refining Co., Ltd. (Thaisarco) was identified by a U.N. group of experts as having purchased minerals from sources connected to the Forces Démocratiques de Libération du Rwanda (FDLR) militia, on September 18, Thaisarco announced that it would suspend all purchases of cassiterite (tin ore) from the Democratic Republic of the Congo [Congo (Kinshasa)]. Thaisarco was the only tin smelter in Thailand and was managed by United Kingdom-based Amalgamated Metal Corp. plc. (Sullivan, 2009).

Zinc.—The domestic demand for zinc in Thailand totaled 94,000 t in 2009, which was a decrease of 17% from the previous year. The demand during the first half of the year was only two-thirds of the normal seasonal demand; demand during the second half of the year, however, was fully normal. The zinc price increased consistently during the second half of 2009 to a year-high level in December of \$2,376 per metric ton. The average annual price was \$1,655 per metric ton compared with \$1,875 per metric ton, which was a decrease of \$220, or 12%. As of December 31, the total mineral resource of zinc silicate and carbonate at the Padaeng Mine at Mae Sod was estimated to be 2,862,000 t grading 10.2% zinc and containing about 293,000 t of zinc metal. Using a cutoff grade of 3.0% zinc, the estimated measured resource was 1,346,000 t with a zinc grade of 10.6%, and the indicated resource was 1,516,000 t with a zinc grade of 9.9% (Padaeng Industry Public Co. Ltd., 2010, p. 10, 13).

In 2009, Padaeng produced 157,000 t of ore grading 22% zinc at the Mae Sod Mine, which included 94,000 t of high-grade ore and 63,000 t of concentrate, which was equivalent to 34,000 t of zinc. The Mae Sod Mine supplied only one-third of the total zinc units needed for the company's smelter, and in 2009, Padaeng imported 162,000 t of raw materials averaging 44% zinc and equivalent to 72,000 t of zinc metal. Most of the imports came from Australia and Peru; the balance came from Taiwan and various other countries. Padaeng's 6,000-m drilling campaign took place at the mine to help in planning for the mine's end of life, and the mine's ore reserves and mine plans were reviewed. At the current production rate, the life of the Mae Sod Mine would be 6.5 years, and mining would last 4 years, with ore crushing and flotation continuing for another 2.5 years.

In 2009, Padaeng's zinc export sales increased by 62% to 31,000 t because the regional zinc demand remained strong. Led by the huge volume of imports by China during the first half of the year, the regional London Metal Exchange stockpile remained stable after a short spike in February (Padaeng Industry Public Co. Ltd., 2010, p. 10, 12).

Industrial Minerals

Cement.—In 2009, although cement prices were stable, sales of Thailand's cement decreased substantially, both to domestic and foreign buyers. Siam Cement Group experienced its first-ever annual revenue decline in international sales. The decreased sales volumes were alleviated by the decrease in the cost of cement transportation, however, and, assisted by the Government's stimulus package, Thailand's domestic cement demand picked up in the second half of 2009 and averaged about 31 Mt. Siam Cement Group expected to sell 17 to 18 Mt in 2009, which was close to its 2008 sales volume (International Cement Review, 2009).

Mineral Fuels

Coal.—The Thai coal firm Banpu Public Co. Ltd. (Banpu) intended to purchase Australia's Centennial Coal Ltd., which owned 10 coal mines in New South Wales, Australia. Banpu's intention was to use Australian coal to stabilize the company's coal mining activity, coal supply, and sales market, which served both domestic coal consumption and coal exports (Mining Journal, 2010). Thailand's domestic coal consumption continued to increase in 2009, particularly consumption by the cement and electricity industries. Thailand's Lanna Resources Public Co. Ltd. imported coal from Indonesia through its joint-venture coal mining projects because Lanna's own domestic coal resources had been exhausted. Thailand's coal industry planned to acquire additional coal reserves overseas (Lanna Resources Public Co. Ltd., 2010).

Natural Gas and Petroleum.—Thailand's Coastal Energy Co., which was an independent exploration and production company with assets in Southeast Asia, acquired a production license from the Government to produce crude oil in the Bua Ban field in the shallow waters of the Gulf of Thailand. The license took effect on January 12, 2009, and was valid for 20 years. The Bua Ban field contains an estimated 21.8 million barrels of proven plus probable reserves. Coastal Energy was the owner (100%) and operator of the field. The company began to develop the Bua Ban field in the second quarter of 2009 (Coastal Energy Co., 2009).

Outlook

The feasibility study of the Puthep copper project was scheduled to be completed by the end of 2009. The environmental and social impact assessment of the project, which was being advanced in parallel with the feasibility study, was expected to be completed in mid-2010. Through the second half of 2010 and 2011, Puthep intends to submit a mine plan, and apply for mining leases (PanAust Ltd., 2010).

Iron and Steel Institute of Thailand estimated an increase of apparent steel consumption by 21% to 12.9 Mt in 2010, including an increase of 8% to 12.7 Mt of steel usage in the steel consumption industries, and an increase of steel inventory to 0.2 Mt from steel producers, traders, and users. Signs of Thai economic recovery were apparent in many sectors in the second half of 2009, and this trend is expected to continue through 2010 (South East Asia Iron and Steel Institute, 2010).

Padaeng is reviewing its exploration of gold and zinc data, plus its options before the end of some of its exploration licenses in June 2010, to finalize decisions on regional exploration and development. The company has been doing intensive field work for 2 to 3 years (Padaeng Industry Public Co. Ltd., 2010, p. 14).

The Government projected the Thai economy to grow by 3.5% on average in 2010, and a 15.5% growth in exports is expected (U.S. Department of State, 2010). The country is expected to stabilize its investment environment and increase its investment capital, and the mining sector is expected to increase exploration and the acquisition of mineral deposits to ensure adequate mineral resources and supplies, especially for the energy-related commodities. Thailand's economic improvement will depend on its political stability.

References Cited

- Australia's Paydirt, 2010, The King and gold: Australia's Paydirt, March, p. 70.
- Bank of Thailand, 2010a, Table 2—Growth rate of domestic production in major sectors: Bank of Thailand, 1 p. (Accessed March 10, 2010, at <http://www.bot.or.th/English/Statistics/Indicators/Docs/tab02.pdf>.)
- Bank of Thailand, 2010b, Table 3—Major non-agricultural products (calendar year): Bank of Thailand, 1 p. (Accessed March 10, 2010, at <http://www.bot.or.th/English/Statistics/Indicators/Docs/tab03.pdf>.)
- Carlin, J.F., Jr., 2010, Tin: U.S. Geological Survey Mineral Commodity Summaries 2010, p. 170-171.
- Coastal Energy Co., 2009, REG-Coastal Energy Co. Bua Ban production license ap: Coastal Energy Co., January 22. (Accessed September 7, 2010, at http://www.easyir.com/easyir/customrel.do?easyirid=8280F68BE42B9E34&version=live&prid=586016&releasejsp=custom_164.)
- Cordier, D.J., 2010, Feldspar: U.S. Geological Survey Mineral Commodity Summaries 2010, p. 54-55.
- Crangle, R.D., Jr., 2010, Gypsum: U.S. Geological Survey Mineral Commodity Summaries 2010, p. 70-71.
- Department of Mineral Resources, 2010, Policy, legislation, rules and regulations on minerals trade, mining and mineral investments as formulated by the Government or State authority: Department of Mineral Resources. (Accessed September 7, 2010, at http://www.dmr.go.th/main.php?filename=index_EN.)
- International Cement Review, 2009, Thailand—Further sales contraction ahead: International Cement Review, May, p. 16.
- Lanna Resources Public Co. Ltd., 2010, Company profile: Lanna Resources Public Co. Ltd., September. (Accessed April 23, 2010, via <http://www.lannaresources.com/>.)
- Mining Journal, 2010, Thai firm targets Australian coal: Mining Journal, July 9, p. 1.
- Oriental Copper Co., Ltd., 2010, Company overview: Oriental Copper Co., Ltd. (Accessed September 30, 2009, at <http://www.orientalcopper.com/orientalcopperpage2.php?id=2>.)
- Padaeng Industry Public Co. Ltd., 2010, Padaeng Industry Plc. annual report of year 2009: Padaeng Industry Public Co. Ltd., 92 p. (Accessed December 11, 2010, at http://www.padaeng.com/pdf/Annual/2009_AnnualReport.pdf.)
- PanAust Ltd., 2010, Our business: PanAust Ltd. (Accessed December 31, 2010, at <http://www.panaust.com.au/thailand-puthep>.)
- South East Asia Iron and Steel Institute, 2010, 2010 steel statistical yearbook: Selangor Darul Ehsan, Malaysia, South East Asia Iron and Steel Institute, 102 p.

Sullivan, David, 2009, Tin industry giant Thaisarco suspends purchases from Congo: Enough Project at the Center for American Progress, September 18. (Accessed September 30, 2010, at <http://www.enoughproject.org/blogs/tin-industry-giant-thaisarco-suspends-purchases-congo>.)

U.S. Department of State, 2010, Thailand: U.S. Department of State background note. (Accessed July 7, 2010, at <http://www.state.gov/r/pa/ei/bgn/2814.htm>.)
van Oss, H.G., 2010, Cement: U.S. Geological Survey Mineral Commodity Summaries 2010, p. 38-39.

TABLE 1
THAILAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2005	2006	2007	2008	2009 ^c
METALS					
Antimony:					
Ore:					
Gross weight	735	2,980	--	--	--
Sb content	347	1,409	--	--	--
Metal, smelter	460	544	271	422	555 ²
Copper, metal, refined:					
Primary ^c	13,700	25,300	11,900	--	--
Secondary ^c	2,100	1,750	814	438	490 ²
Total	15,800	27,050	12,714	438	490 ²
Gold kilograms	4,400	4,300	3,401	2,721	5,400 ²
Iron and steel:					
Iron ore:					
Gross weight	230,946	264,289	1,554,860	2,029,100 ^r	1,400,800 ²
Fe content ^c	116,000	132,000	779,000	855,000	800,000
Crude steel thousand metric tons	5,161	4,914	5,565	5,211	3,645 ²
Lead, metal, refined, secondary	61,100	61,160	73,159	73,303	55,504 ²
Manganese ore:					
Metallurgical-grade, gross weight, 46% to 50% MnO ₂	88,500	--	9,500	111,000	100,000
Mn content ^c	42,400	--	4,550	52,700	50,000
Silver kilograms	14,100	11,800	7,727	5,465	15,300 ²
Tantalum, metal and oxide powder	150	230	142	158	50 ²
Tin:					
Concentrate:					
Gross weight	188	225	149	235	210
Sn content	158	190	122	215 ^r	153 ²
Metal, primary	31,600	27,540	23,104	21,860	19,423 ²
Tungsten concentrate:					
Gross weight	622	546	923	1,112	950 ²
W content ^c	345	303	477 ^r	617 ^r	600
Zinc:					
Ore:					
Gross weight	203,810	214,023	176,042	118,739	115,000
Zn content	30,572	32,100 ^c	32,921	17,811	34,000
Metal, primary	60,866	94,779	99,337	107,753	104,695 ²
Alloy, Zn content	40,320	61,600	64,600	70,000	31,000
INDUSTRIAL MINERALS					
Barite	101,186	96,469	8,631	9,180	9,000
Cement, hydraulic thousand metric tons	37,872	39,408	35,668	31,651 ^{r,2}	31,181 ²
Clays:					
Ball clay	393,935	1,003,267	563,353	1,499,993	1,000,000
Kaolin, marketable:					
Beneficiated, washed	156,853	157,900	159,186	162,215	160,000
Nonbeneficiated, unwashed	580,376	675,886	518,143	479,443	500,000
Filler	9,031	9,326	7,985	6,061	6,000
Diatomite	990	1,344	1,260	4,075	4,000
Feldspar	1,149,717	1,067,684	684,668	670,618	600,000
Fluorspar, crude, metallurgical-grade	295	3,240	1,820	29,529	20,000
Gemstones thousand carats	699	81	102	32	30
Gypsum thousand metric tons	7,113	8,355	8,643	8,500	8,500
Perlite	5,500 ^e	22,000	6,400	7,000	7,000
Phosphate rock, crude	3,020	900	3,550	3,675	3,000

See footnotes at end of table.

TABLE 1—Continued
THAILAND: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2005	2006	2007	2008	2009 ^e	
INDUSTRIAL MINERALS—Continued						
Salt:						
Rock	1,074,214	1,008,251	1,134,931	1,211,581	1,200,000	
Other ^c	100,000	100,000	100,000	100,000	100,000	
Sand, silica, glass	718,320	861,847	844,071	495,848	500,000	
Stone:						
Calcite	692,850	625,950	672,580	823,706	750,000	
Dolomite	795,466	899,512	1,108,425	1,353,763	1,200,000	
Granite:						
Dimension stone	cubic meters	9,500 ^e	8,321	10,515	10,579	10,000
Industrial rock	thousand metric tons	3,000 ^e	4,463	5,229	5,190	5,000
Limestone:						
Dimension stone	do.	--	201	233	233	200
For cement manufacture only	do.	55,584	61,583	63,799	54,885	60,000
Construction and other uses	do.	75,000 ^e	87,887	87,402	87,000	90,000
Marble, dimension stone and fragment	cubic meters	267,797	547,582	848,806	664,930	760,000
Marl for cement manufacture only		196,500	68,700	31,750	41,720	37,000
Quartz		2,604	2,897	4,924	3,290	4,000
Shale for cement manufacture only	thousand metric tons	3,695	5,590	4,769	4,026	4,000
Travertine		--	3,316	3,490	3,640	3,000
Talc and related materials:						
Pyrophyllite		177,684	131,843	415,420	106,600	200,000
Talc		10,270	4,374	3,508	3,264	3,000
Zirconium		--	--	1,023	--	--
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite	thousand metric tons	21,429	19,071	18,239	18,095	20,000
Natural gas, gross production	million cubic meters	23,689	24,317	25,400	27,576	26,362 ²
Petroleum:						
Crude	thousand 42-gallon barrels	41,570	47,067	48,745	52,805	56,302 ²
Natural gas condensate	do.	25,363	27,466	28,778	31,157	30,625 ²
Refinery products:						
Liquefied petroleum gas	do.	45,241	45,475	48,759	53,842	51,000
Gasoline	do.	58,072	57,172	54,739	53,142	54,000
Jet fuel	do.	30,421	35,240	33,478	37,750	36,000
Kerosene	do.	6,395	6,548	776	1,226	1,000
Distillate fuel oil	do.	38,740	39,681	40,581	43,231	40,000
Residual fuel oil ^e	do.	25,000	26,000	27,109 ²	26,500	30,000
Unspecified ^{e,3}	do.	3,600	3,600	3,626 ²	3,600	4,000
Total ^{e,4}	do.	207,000	214,000	209,000	219,000	216,000

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through September 28, 2010.

²Reported figure.

³Includes refinery fuel and refinery gains or losses.

⁴Data are rounded to 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, 2005-2009.

TABLE 2
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Antimony		Amco Thai Mining Co. (Hibino Metal Industry)	Antimony smelter, Ban Pin, Lampang Province	555
Do.		Other companies	Cascaded in different Thai Provinces	NA
Barite		Asian Mineral Resources Co. Ltd.	Loei, Mae Hong Son, Nakhon Si Thammarat, and Satun Provinces	60
Do.		P&S Barite Mining Co. Ltd.	Loei and Nakhon Si Thammarat Provinces	60
Cement		Asia Cement Co. Ltd.	Pra Phutthabath, Saraburi Province	4,800
Do.		Jalaprathan Cement Co. Ltd. (Cement Francais S.A., 37%; Veatprapat Holding Co. 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 Co. Ltd. (CEMEX Asia Holdings Ltd., 99%)	Chalerm Phrakiat, Saraburi Province	700
Do.		Siam Cement Industry Co. Ltd. (Bureau of the Crown Property, 30%; Thai Security Depository Co. Ltd., 6.94%; CPB Equity Co. Ltd., 5.6%; other financial institutions and the general public, 57.46%)	Kaeng Khoi, Phabudhabat, and Khao Wong, Saraburi Province; Chae hom, Lampang Province; Thung Song, Thammarat Province; and Ta Luang, Ayutthaya Province	23,200
Do.		Siam City Cement Co. Ltd. (SCCC) (Holcim Ltd., 33.7%; Rattanak family, 27%; other investors, 39.3%)	Kaeng Khoi, Saraburi Province	14,500
Do.		TPI Polene Co. Ltd.	do.	9,900
Coal, lignite		Electricity Generating Authority of Thailand (EGAT) (Government, 100%)	Mae Moh, Lampang Province	20,000
Do.		Lanna Lignite Public Co. Ltd.	Ban Pakha, Lamphun Province	1,000
Copper		Thai Copper Industries Public Co. Ltd. (TCI)	Rayong Industrial Park	165
Feldspar, concentrate		Asia Mineral Processing Co. Ltd.	Provinces of Nakhon Si Thammarat and Trang	500
Fluorspar, concentrate		Asian Mineral Resources Co. 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 Ltd., 100%)	Chatree, Pichit Province	5,000
Gypsum		Vanich Gypsum Co. Ltd.	Khlong Prab, Mai Rieng, Thoong Yai Mai in Provinces of Nakhon Si Thammarat and Surat Thani	8,500
Do.		Lotus Mines Co. Ltd.	Nakornsawan	NA
Do.		General Mining and Trading Co. Ltd.	Talad, Muang	NA
Iron ore, gross weight		P.T.K. Mining Co. Ltd.	Phu Ang, Loei Province	720
Lead, in concentrate		Kanchanaburi Exploration and Mining Co. 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, Tantanwan, offshore in the Gulf of Thailand	35
Do.	do.	PTT Exploration and Production Public Co. Ltd. (PTTEP)	Arthit, Songkhla, Gulf of Thailand	20
Do.	do.	Thai Shell Exploration and Production Co. Ltd.	Sirikit, 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 Co. Ltd.	Phrapradaeng, Samutprakarn Province	120
Do.		Bangkok Steel Industry Public Co. Ltd.	do.	300
Do.		Tata Steel (Thailand) Plc (Tata Steel Ltd., 67.11%; McDonald Investment, 6.5%; other investors, 26.39%)	Map Ta Phut, Rayong Province; Sriracha, Chonburi Province; Ban Mon, Saraburi Province	1,700
Do.		Namheng Steel Co. Ltd.	Lopburi Province	300
Do.		Sahaviriya Group Corp. Ltd.	Bang Saphan, Prachuap Khiri Khan Province	2,400
Do.		Siam United Steel Co. Ltd.	Rayong Province	1,000
Do.		G-Steel Plc (formerly Siam Ystrip Mill Plc)	Map Ta Phut, Rayong Province	600

See footnotes at end of table.

TABLE 2—Continued
THAILAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2009

(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) Co. Ltd. (H.C. Starck GmbH, 94.98%, and others, 5.02%)	Map Ta Phut, Rayong Province	250
Tin:				
Concentrate		Numerous small companies	Nakhon Si Thammarat, Phangnga, Phuket, and Rayong Provinces	3
Refined		Thailand Smelting and Refining Co. Ltd. (Thaisarco) (Amalgamated Metal Corp., 75.25%, and other, 24.75%)	Phuket, Phuket Province	30
Tungsten, in concentrate	metric tons	SC Mining Co. Ltd. (Som Chai family, 100%)	Ban Pin, Chiang Mai Province	650
Zinc:				
In concentrate		Padaeng Industry Public Co. Ltd. (PDI) (Bali Ventures Ltd., 21.7%; Thai Ministry of Finance, 13.81%; RAK Minerals & Metals Investments, 12.5%; and others, 52%)	Mae Sod district, Tak Province	65
Refined		do.	Smelter in Muang district, Tak Province; Roaster plant in Rayong Province	115

Do., do. Ditto. NA Not available.