



# 2016 Minerals Yearbook

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## PHILIPPINES

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# THE MINERAL INDUSTRY OF THE PHILIPPINES

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In 2016, the Philippines' gross domestic product (GDP) at 2016 prices increased to \$303.8 billion<sup>1</sup> from \$292 billion (revised) in 2015. One of the main mineral commodities produced in the country was nickel, which accounted for about 17% of world mine production and 6.2% of the world's total reserves. The Philippines accounted for about 4% of world production of mined cobalt and about 4% of the world's total reserves of cobalt. The country also produced other mineral commodities, such as cement, chromite, copper, gold, sea salt, and silver. The Philippines also produced smelted and refined copper (table 1; Schnebele, 2017; Shedd, 2017, 2018; Bangko Sentral ng Pilipinas, 2018; McRae, 2018).

## Minerals in the National Economy

In 2016, the mining and quarrying sector contributed 1% to the Philippines' real GDP and the construction sector contributed about 6.2%. The total estimated value for metallic minerals production was \$2.16 billion compared with \$2.42 billion (revised) in 2015. The value of gold produced in 2016 was \$955.1 million; nickel and nickel products, \$803.8 million; and copper, \$372.6 million. The contribution to the country's metallic mineral production value was distributed as follows—gold, 44%; nickel (direct-shipping ore and mixed nickel-cobalt sulfide), 37%; copper, 18%; and the combined value of chromite, iron ore, and silver, 1%. In 2016, employment in the mining sector was estimated to be 219,000 people compared with 236,000 in 2015. The estimated number of employees in the mining and quarrying sector was equivalent to about 0.5% of the total number of people employed in the country (Bangko Sentral ng Pilipinas, 2017; Mines and Geosciences Bureau, 2017a, p. 1; 2017b; 2018).

## Government Policies and Programs

The legislative framework for the mineral sector in the Philippines is provided by The Philippine Mining Act of 1995 (the Mining Act of 1995), which is also known as Republic Act No. 7942, and stipulates that all mineral resources on public and private lands within the territory and exclusive economic zones of the country are owned by the state. The Mining Act of 1995 provides for regulations on mineral-resource development, requires the Government to monitor mineral activity (production, trade, and value) and maintain a database of mineral reserves, and encourages direct investment by the private and public sectors in mineral exploration and development activities in the Philippines. The Mining Act of 1995 allows for three types of mineral agreements, each valid for 25 years and renewable for an additional 25 years. The first type is a Mineral Production Sharing Agreement (MPSA)—the

Government grants the contractor the exclusive right for mining within the contracted area and shares in the revenue from the minerals produced. The logistics for financing, management, personnel, and technology are provided by the contractor. The second type is the Co-Production Agreement (CA)—the Government and the contractor agree for the Government to provide input to the mining operations. The third type is a Joint Venture Agreement—the Government and the contractor create a joint-venture company and both parties have equity shares. In addition to earning equity, the Government is entitled to shares in the gross output (Mines and Geosciences Bureau, 2010, p. 1, 26–27).

The Mines and Geosciences Bureau (MGB), under the Department of Environment and Natural Resources (DENR) is the Government entity responsible for the implementation of the Mining Act of 1995. The MGB also administers mineral lands and mineral resources; performs mineral exploration surveys and studies, such as chemical, geologic, mining, and metallurgical investigations in proposed mining areas; and performs research and development of such areas. MGB assists the Environmental Management Bureau (EMB) in conducting and processing environmental impact statements for mining projects (Mines and Geosciences Bureau, 2010, p. 11).

Executive Order No. 79 of July 6, 2012, was designed to institutionalize and implement reforms in the Philippine mining sector and provide policies and guidelines to ensure environmental protection and responsible mining in the use of mineral resources. It also imposed a moratorium on the approval of new mining permits and banned mining on agricultural lands, fishery zones, island ecosystems, protected areas under the National Integrated Protected Areas Systems in accordance with the Republic Act No. 7586, and tourist destinations. The small-scale mining of metallic minerals is prohibited with the exception for the mining of chromite, gold, and silver (President of the Philippines, 2012).

With regard to the petroleum industry, the Oil Exploration and Development Act of 1972 provides the legal basis for the exploration and development of indigenous petroleum resources in the Philippines. Contracts are granted through public bidding or through negotiations (Philippines Department of Energy, 2018).

In July 2016, the Government put into effect Memorandum Order (DMO) No. 2016–01 to audit all operating mines and mines under care-and-maintenance and (or) suspended status. The order placed a moratorium on the acceptance, processing, and approval of mining applications and new mining projects for metallic and nonmetallic minerals. The audit evaluated the compliance and efficiency of the environmental protection measures implemented by each mining operation (Department of Environment and Natural Resources, 2016; Serapio and Dela Cruz, 2016).

<sup>1</sup>Where necessary, values have been converted from Philippine pesos (PHP) to U.S. dollars (US\$) at an average rate of PHP47.66=US\$1.00 for 2016 and PHP45.62=US\$1.00 for 2015.

The mine audit was concluded in September and the DENR recommended the suspension of 20 metallic mines, unless the mines' shortcomings were addressed. The list included 14 nickel mines, 3 gold and silver mines, 2 chromite mines, and 1 copper, gold, and silver mine. The DENR implemented a development plan for the suspended mines with the goal of protecting miners from the loss of work, although no specifics were revealed (Serapio, 2016; Mines and Geosciences Bureau, 2017a).

## Production

In 2016, production increased for most industrial mineral commodities, such as phosphate rock (gross weight), by 47.5%; red clay, 46.6%; phosphate rock ( $P_2O_5$  content), 45.9%; marble, 38.2%; pumice, 32.7%; lime, 32.2%; silica sand, 32%; stone (crushed, other), 30.8%; clay (other), 29%; white clay, 23.6%; kaolin, 23%; feldspar, 22.5%; volcanic tuff, 17.6%; sand and gravel (other), 14.3%; and volcanic cinder, 11.9%. The metallic minerals with significant increases compared with those of 2015 included chromite, 66.1%; refined copper, 21%; mined silver, 17.5%; smelted copper, 13.6%; raw steel, 11.1%; and mined gold, 8.2%. The mineral fuels with significant increases compared with those of 2015 included natural gas, 14.7%.

Decreases in industrial minerals production included limestone, 95.7%, and dolomite, 40.2%. Decreases in metal production were registered for iron (metal content), 95.0%, iron (gross weight), 93.9%; lead (refined, secondary), 35.7%; mined cobalt, 30.2%; and mined nickel, 12.7%. Such conditions as low metal prices, mine suspensions after the audit, unfavorable weather conditions, and mine maintenance status could have affected some mineral commodities' production. According to the MGB, these conditions contributed to about a 10.8% decrease in the value of metallic mineral production value in 2016 (table 1; Mines and Geosciences Bureau, 2017a).

## Structure of the Mineral Industry

In 2016, according to the MGB, the Philippines had a total of 905 approved mining tenements—311 MPSAs, 224 mining permits, 211 certificates of accreditation, 81 industrial sand and gravel permits, 43 mineral processing permits, 26 exploration permits, 5 financial or technical assistance agreements, 2 lease contracts, and 2 special mines permits. As of 2016, the country had a total of 62 nonmetallic mines, 50 metallic mines, 2,397 small quarries and sand and gravel operations, and 5 processing plants (2 for gold, 2 for nickel, and 1 for copper) (Mines and Geosciences Bureau, 2017b, 2018).

Many mineral commodity producers in the Philippines were privately owned. After the mine audit conducted by the DENR and the MGB concluded in September 2016, the following major metallic mining companies were permitted to continue operations in the country: APEX Mining Company Inc., Atlas Consolidated Mining and Development Corp., Cagdianao Mining Corp., Greenstone Resources Corp., Philex Mining Corp., Philsaga Mining Corp., Platinum Group Metals Corp., Rio Tuba Nickel Mining Corp., Taganito Mining Corp., and Techiron Resources Inc. The country's major mineral industry facilities are listed in table 2 (Mines and Geosciences Bureau, 2017a, p. 3).

Among the mineral commodities and companies affected by the suspension of 20 mines that was recommended by the DENR were chromite (Benguet Corp., Krominco Inc.); gold and silver (Benguet Corp., Lepanto Consolidated Mining Corp.); copper, gold, and silver (OceanaGold Philippines Inc.); iron ore (Ore Asia Mining and Development Corp.); and nickel (Agata Mining Ventures Inc., Berong Nickel Corp., CTP Construction & Mining Corp., Hinatuan Mining Corp., SR Metals, Inc., and Zambales Diversified Metals Corp.) (Asia Miner, The, 2016).

## Mineral Trade

In 2016, the country's total exports were valued at \$57.4 billion compared with \$58.8 billion in 2015; the total value of imports was \$84.1 billion compared with \$71.1 billion in 2015. In 2016, the Philippines' leading trading partner was China, which accounted for 15.5% (\$21.9 billion) of the country's total trade, including \$6.4 billion in exports to China and \$15.6 billion in imports from China. The second-ranked trading partner was Japan, which accounted for 15.2% (\$21.6 billion) of total trade; exports to and imports from Japan were valued at \$11.7 billion and \$9.9 billion, respectively. The country's third-ranked trading partner was the United States, which accounted for 11.6% (\$16.4 billion) of total trade; exports to and imports from the United States were valued at \$8.9 billion and \$7.6 billion, respectively. Total trade with the countries of the Association of Southeast Asian Nations (ASEAN) accounted for \$30.7 billion, or 21.7% of the country's total trade; trade with the countries of the European Union accounted for \$13.7 billion, or 9.7% of the country's total trade (National Statistics Office of the Philippines, 2017).

According to the MGB, in 2016, the top mineral exports, which included copper, gold, and nickel, amounted to \$2.2 billion compared with \$2.8 billion in 2015. The main destinations for mineral exports were Australia, Canada, China, and Japan. The main mineral commodity imports were iron and steel and mineral fuels and related materials and were valued at about \$11.3 billion (which was about 13.4% of the country's total import value) compared with about \$11.9 billion in 2015 (Mines and Geosciences Bureau, 2016, 2017b; National Statistics Office of the Philippines, 2017).

## Commodity Review

### Metals

**Gold.**—In 2016, mined gold production in the country totaled 23,053 kilograms (kg) of gold content, which was an increase of 8.2% compared with the 21,314 kg (revised) produced in 2015. In September 2015, Metals Exploration Plc of the United Kingdom announced the completion of construction of the Runruno gold project. The following month, the MGB ordered a partial suspension of operations at Runruno after the project sustained water damage from Super Typhoon Koppu (Lando). In April 2016, the company announced the lifting of the suspension order and by June, the company achieved its first gold production. The first gold sale from this project took place in November, and it received the permits required to export dore bullion. The total production

from Runruno's first pours until December 2016 was 255 kg (table 1; Asia Miner, The, 2015; Metal Exploration Plc., 2017, p. 9–10, 12).

**Nickel.**—Based on information compiled using trade data, in 2016, the production of mined nickel in the Philippines decreased to an estimated 487,000 metric tons (t) from 558,000 t (revised) in 2015 (table 1). The decrease in nickel production was mainly the result of low metal prices and the suspension of mining operations imposed by the DENR. As of 2016, of the 28 nickel mines in operation, 7 had operations suspended after the mine audit and 4 temporarily stopped operations owing to low nickel prices (Mines and Geosciences Bureau, 2017a, p. 1).

### *Industrial Minerals*

**Cement.**—In 2016, the production of cement in the Philippines was estimated to be 25 million metric tons (Mt) compared with 24 Mt in 2015. The estimated increase in cement production was the result of continuous growth in the construction sector and reconstruction efforts after Super Typhoon Koppu (Lando) struck in October 2015. In 2016, the construction sector grew by 13.7% compared with 11.6% in 2015 (table 1; Bangko Sentral ng Pilipinas, 2017).

In August 2016, Republic Cement Group announced a 10% capacity expansion to add to its current 8-million-metric-ton-per-year (Mt/yr) capacity at its grinding plant in Bulacan Province. The capacity expansion was planned in anticipation of an increase in cement demand owing to the Government's planned increase in infrastructure expenditures for 2017 to \$18.5 billion. In December, DMCI Holdings announced plans to build a 1.7-Mt/yr cement plant on Semirara Island within the Visayan Islands group. The plant was expected to include a 400,000-metric-ton-per-year grinding mill and a powerplant. The company also planned to invest \$188 million to construct three additional cement grinding plants in Batangas, Iloilo, and Zamboanga. The new projects were expected to be completed in 2020 (Global Cement, 2016a, b).

In July 2016, Eagle Cement started the construction of its third cement production line to be integrated with the plant in Bulacan Province. The combined production capacity of the first two lines was 5.1 Mt/yr. Eagle Cement expected the third line to be completed by 2018, which would increase the company's cement production capacity to 7.1 Mt/yr. By 2020, Eagle Cement planned to increase its total capacity to 9.1 Mt/yr with the addition of a fourth cement production line in Cebu Province (Eagle Cement, 2016, p. 13).

### **Outlook**

In 2016, the Philippines' metallic minerals sector was challenged by the suspension or temporary halting of operations at mining facilities in accordance with DMO No. 2016–01. In the near future, the state of the Philippines mining sector and foreign direct investment in the sector will be directly related to how the Government goes forward with the mining audits and how or when it decides to lift the suspensions. The construction and industrial minerals sectors are expected to continue to expand as cement companies increase production capacities and update facilities in anticipation of the Government's proposed increase in infrastructure expenditures in 2017.

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TABLE 1  
PHILIPPINES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

| Commodity <sup>2</sup>                                          | 2012                 | 2013               | 2014                 | 2015                   | 2016                   |
|-----------------------------------------------------------------|----------------------|--------------------|----------------------|------------------------|------------------------|
| <b>METALS</b>                                                   |                      |                    |                      |                        |                        |
| Chromite, mine production                                       | 36,628               | 35,281             | 47,056               | 15,502                 | 25,745                 |
| Cobalt, mine production, Co content <sup>c,3</sup>              | 2,700                | 2,800              | 4,600                | 4,300                  | 3,000                  |
| Copper:                                                         |                      |                    |                      |                        |                        |
| Mine production, Cu content                                     | 65,444               | 90,861             | 91,824               | 83,835                 | 83,649                 |
| Smelter production, primary                                     | 97,000               | 181,900            | 153,200              | 189,200                | 215,000                |
| Refinery production, primary                                    | 98,400 <sup>r</sup>  | 153,000            | 130,000              | 153,000                | 185,100                |
| Gold, mine production, Au content kilograms                     | 14,596               | 17,248             | 18,423               | 21,314 <sup>r</sup>    | 23,053                 |
| Iron and steel, raw steel thousand metric tons                  | 1,260                | 1,308              | 1,196                | 968                    | 1,075                  |
| Iron ore, mine production:                                      |                      |                    |                      |                        |                        |
| Gross weight                                                    | 1,800,000            | 1,056,694          | 153,775              | 107,119 <sup>r</sup>   | 6,549                  |
| Fe content                                                      | 1,148,232            | 793,130            | 103,390 <sup>r</sup> | 83,860 <sup>r</sup>    | 4,177                  |
| Lead, refinery production, secondary <sup>c</sup>               | 32,000               | 32,000             | 30,000               | 28,000                 | 18,000                 |
| Manganese, mine production:                                     |                      |                    |                      |                        |                        |
| Gross weight                                                    | 500                  | 3,100              | 6,900                | --                     | --                     |
| Mn content                                                      | 200                  | 1,300              | 3,000                | --                     | --                     |
| Nickel: <sup>c,4</sup>                                          |                      |                    |                      |                        |                        |
| Mine production, ore, Ni content                                | 460,000 <sup>r</sup> | 466,000            | 586,000              | 558,000 <sup>r</sup>   | 487,000                |
| Intermediate production, matte                                  | 23,900               | 26,000             | 50,600               | 49,200                 | 50,000                 |
| Silver, mine production, Ag content kilograms                   | 49,211               | 40,043             | 23,005               | 29,952 <sup>r</sup>    | 35,186                 |
| Zinc, mine production, Zn content                               | 19,559               | 16,730             | --                   | --                     | --                     |
| <b>INDUSTRIAL MINERALS</b>                                      |                      |                    |                      |                        |                        |
| Cement, hydraulic thousand metric tons                          | 18,907               | 20,150             | 21,305               | 24,050                 | 25,000 <sup>e</sup>    |
| Clay and shale:                                                 |                      |                    |                      |                        |                        |
| Bentonite                                                       | 2,699                | 3,329              | 3,369                | 3,477                  | 3,231                  |
| Kaolin                                                          | 4,631                | 6,568              | 7,050                | 8,179                  | 10,059                 |
| Other                                                           | 5,707                | 6,992              | 8,605                | 8,948                  | 11,542                 |
| Other, red                                                      | 9,405                | 9,551              | 10,512               | 11,680                 | 17,126                 |
| Other, white                                                    | 13,623               | 17,532             | 18,769               | 20,983                 | 25,942                 |
| Feldspar, mine production                                       | 24,969               | 30,388             | 34,232               | 38,067                 | 46,630                 |
| Lime                                                            | 6,631                | 6,690              | 7,877                | 8,154                  | 10,782                 |
| Perlite                                                         | 9,221                | 14,249             | 17,194               | 18,575                 | 21,645                 |
| Phosphate rock:                                                 |                      |                    |                      |                        |                        |
| Gross weight                                                    | 2,952                | 3,478              | 3,897                | 5,437                  | 8,019                  |
| P <sub>2</sub> O <sub>5</sub> content                           | 1,004                | 1,183              | 1,325                | 1,850                  | 2,700                  |
| Pumice and related materials:                                   |                      |                    |                      |                        |                        |
| Pumice                                                          | 2,895                | 5,566              | 6,018                | 6,261                  | 8,306                  |
| Volcanic tuff                                                   | 22,295               | 26,930             | 28,884               | 40,775                 | 47,966                 |
| Salt, sea                                                       | 774,815              | 992,640            | 1,016,263            | 1,020,000 <sup>e</sup> | 1,030,000 <sup>e</sup> |
| Stone, sand, and gravel:                                        |                      |                    |                      |                        |                        |
| Sand and gravel, construction <sup>5</sup> thousand metric tons | 106,662              | 144,480            | 161,453              | 170,280                | 194,646                |
| Silica, mine production, sand                                   | 260                  | 429                | 467                  | 525                    | 693                    |
| Stone, crushed:                                                 |                      |                    |                      |                        |                        |
| Dolomite                                                        | 1,627,028            | 2,611,853          | 2,948,034            | 3,073,695              | 1,839,178              |
| Limestone <sup>6</sup> thousand metric tons                     | 53,708               | 73,359             | 77,665               | 83,747                 | 3,580                  |
| Volcanic cinder                                                 | 5,551                | 6,662              | 6,856                | 7,736                  | 8,658                  |
| Other <sup>7</sup> thousand metric tons                         | 9,133                | 11,409             | 12,417               | 13,672                 | 17,880                 |
| Stone, dimension, marble                                        | 28,956               | 51,594             | 60,572               | 67,494                 | 93,304                 |
| <b>MINERAL FUELS AND RELATED MATERIALS</b>                      |                      |                    |                      |                        |                        |
| Coal:                                                           |                      |                    |                      |                        |                        |
| Bituminous thousand metric tons                                 | 1,248                | 1,395              | 1,613                | 1,690                  | 1,700 <sup>e</sup>     |
| Subbituminous do.                                               | 8,352                | 9,337              | 10,793               | 11,310                 | 12,000 <sup>e</sup>    |
| Natural gas million cubic meters                                | 3,810 <sup>r</sup>   | 3,510 <sup>r</sup> | 3,691 <sup>r</sup>   | 3,470 <sup>r</sup>     | 3,979                  |

See footnotes at end of table.

TABLE 1—Continued  
PHILIPPINES: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

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<sup>6</sup>Estimated. <sup>7</sup>Revised. do. Ditto -- Zero.

<sup>1</sup>Table includes data available through February 6, 2018. All data are reported unless otherwise noted. Estimated data are rounded to no more than three significant digits.

<sup>2</sup>In addition to the commodities listed, the Philippines produced platinum-group metals as byproducts of other metal production, quartz, sulfur, tellurium, crude petroleum, and refinery products, such as liquefied petroleum gas, gasoline, jet fuel, kerosene, distillate fuel oil, residual fuel oil, and refinery fuel, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>The majority of the nickel laterite produced in the Philippines was exported to China, but whether cobalt content was recovered is not known.

<sup>4</sup>Data compiled using import data from the United Nations Comtrade database for nickel ores and concentrates (code 2604) from the Philippines and reported by Australia, Canada, China, Japan, Macedonia, India, the Republic of Korea, and Ukraine.

<sup>5</sup>Includes "pebbles" and "soil" not further described.

<sup>6</sup>Includes limestone for agricultural, cement manufacturing, industrial, and other uses.

<sup>7</sup>Includes materials described as rock, crushed or broken and blasted; stones, cobbles, and boulders; pebbles; and rock aggregates.

TABLE 2  
PHILIPPINES: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

| Commodity                       | Major operating companies and major equity owners                           |                                                                             | Location of main facilities                                                                                                                                                                                                                                                   | Annual capacity                    |
|---------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Cement                          | CEMEX Philippines Group                                                     |                                                                             | Cement plants at Naga, Cebu Province (APO Cement Corp.), and Antipolo City, Rizal Province (Solid Cement Corp.)                                                                                                                                                               | 5,700,000.                         |
| Do.                             | Eagle Cement Co.                                                            |                                                                             | Bulacan cement plant (two production lines) in Barangay Akle, San Ildefonso, Bulacan                                                                                                                                                                                          | 5,100,000.                         |
| Do.                             | LafargeHolcim Philippines, Inc.                                             |                                                                             | Bulacan plant at Norzagaray, Bulacan Province; Davao plant at Barrio Ilang, Davao City; La Union plant at Bacnotan, La Union Province; Lugait plant at Lugait, Misamis Oriental Province; Mabini Cement Grinding Plant                                                        | 9,300,000.                         |
| Do.                             | Republic Cement and Building Materials, Inc.                                |                                                                             | Batangas plant at Taysan, Batangas Province; Bulacan plant at Norzagaray, Bulacan Province; Danao plant at Danao City, Cebu Province; Iligan Plant at Iligan City, Isabela Province; Norzagaray Plant at Norzagaray, Bulacan Province; Teresa Plant at Teresa, Rizal Province | 8,000,000.                         |
| Do.                             | Northern Cement Corp.                                                       |                                                                             | Northern cement plant at Sison, Pangasinan Province                                                                                                                                                                                                                           | NA.                                |
| Do.                             | Taiheiyo Cement Philippines, Inc.                                           |                                                                             | Taiheiyo cement plant at San Fernando, Cebu Province                                                                                                                                                                                                                          | NA.                                |
| Chromite, Cr content            | Consolidated Mines Inc. (owner) and Benguet Corp. (operator)                |                                                                             | Masinloc chromite mine (Coto chromite deposit) in Coto, 27 kilometers east of the Port of Masinloc in Zambales Province                                                                                                                                                       | 5,000. <sup>1</sup>                |
| Do.                             | Techiron Resources Inc.                                                     |                                                                             | Homonhon chromite project                                                                                                                                                                                                                                                     | 17,000.                            |
| Do.                             | Krominco Inc.                                                               |                                                                             | Dinagat chromite project—Redondo Mine (Mt. Redondo deposit) in the Municipality of Loreto, Dinagat Island                                                                                                                                                                     | 26,000. <sup>1</sup>               |
| Copper, mine output, Cu content | Carmen Copper Corp. (Atlas Consolidated Mining and Development Corp., 100%) |                                                                             | Toledo Copper Complex (Carmen and Lutopan mining) area in the Central Highlands of Cebu Island                                                                                                                                                                                | 20,000.                            |
| Do.                             | OceanaGold Philippines Inc.                                                 |                                                                             | Didipio copper-gold project on the north of Luzon Island in northern Philippines                                                                                                                                                                                              | 25,010. <sup>1</sup>               |
| Do.                             | Philex Gold Inc. (Philex Mining Corp.), 81%                                 |                                                                             | Padcal copper project in Tuba, Benguet Province, Luzon Island                                                                                                                                                                                                                 | 21,000.                            |
| Copper, metal                   | Glencore plc.                                                               |                                                                             | Philippine Associated Smelting and Refining Corp. (PASAR) at Isabel, Leyte Province                                                                                                                                                                                           | 250,000 smelter; 173,000 refinery. |
| Gold, mine output, Au content   | kilograms                                                                   | APEX Mining Company Inc.                                                    | APEX Maco operation                                                                                                                                                                                                                                                           | 1,500.                             |
| Do.                             | do.                                                                         | Benguet Corp.                                                               | Acupan contract mining project, Benguet Province                                                                                                                                                                                                                              | 800. <sup>1</sup>                  |
| Do.                             | do.                                                                         | Carmen Copper Corp. (Atlas Consolidated Mining and Development Corp., 100%) | Toledo Copper Complex (Carmen and Lutopan mining) area in the Central Highlands of Cebu Island                                                                                                                                                                                | 1,000.                             |
| Do.                             | do.                                                                         | Greenstone Resources Corp. (affiliated with Red 5 Philippines Ltd.)         | Siana gold project, Surigao del Norte Province, Mindanao Island                                                                                                                                                                                                               | 1,000.                             |
| Do.                             | do.                                                                         | Lepanto Consolidated Mining Co.                                             | Victoria and Teresa Mines in Mankayan, Benguet Province                                                                                                                                                                                                                       | 2,000. <sup>1</sup>                |
| Do.                             | do.                                                                         | Metals Exploration Plc.                                                     | Runruno gold project, 350 kilometers north of Manila, Nueva Vizcaya Province                                                                                                                                                                                                  | NA.                                |
| Do.                             | do.                                                                         | OceanaGold Philippines Inc.                                                 | Didipio copper-gold project on the north of Luzon Island in northern Philippines                                                                                                                                                                                              | 4,000. <sup>1</sup>                |
| Do.                             | do.                                                                         | Philex Gold Inc. (Philex Mining Corp.), 81%                                 | Padcal Mine (Sto. Tomas II deposit) at Tuba, Benguet Province, Luzon Island                                                                                                                                                                                                   | 5,000.                             |
| Do.                             | do.                                                                         | Philippines Gold Processing & Refining Corp.                                | Masbate gold project, 350 kilometers south of Manila, Masbate Province                                                                                                                                                                                                        | 6,000.                             |
| Do.                             | do.                                                                         | Philippine Mining Development Corp.                                         | Diwalwal Direct State Development Project at Mount Diwalwal in Davao del Norte Province                                                                                                                                                                                       | 100.                               |
| Do.                             | do.                                                                         | Philsaga Mining Corp.                                                       | Banahaw gold project                                                                                                                                                                                                                                                          | NA.                                |
| Do.                             | do.                                                                         | TVI Resources Development Philippine Inc., 100%                             | Canatuan mining project located east of Siocon, Zamboanga del Norte Province, Mindanao Island                                                                                                                                                                                 | 500. <sup>2</sup>                  |

See footnotes at end of table.



TABLE 2—Continued  
PHILIPPINES: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Metric tons unless otherwise specified)

| Commodity                       |                            | Major operating companies<br>and major equity owners                                                                                          | Location of main facilities                                                                                                 | Annual capacity              |
|---------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Gold, refined                   | kilograms                  | Bangko Sentral ng Pilipinas                                                                                                                   | Mint and Refinery Operations Department at Quezon City                                                                      | NA.                          |
| Do.                             | do.                        | Mindanao Mineral Processing and Refining Corp. and Philsaga Mining Corp.                                                                      | Co-O gold project in Agusan del Sur Province, Mindanao Island                                                               | 3,500.                       |
| Do.                             | do.                        | Metals Exploration Plc.                                                                                                                       | Runruno gold project, 350 kilometers north of Manila, Nueva Vizcaya Province                                                | NA.                          |
| Iron ore                        |                            | Ore Asia Mining and Development Corp.                                                                                                         | Camachin iron ore mining project in Bulacan Province                                                                        | NA. <sup>1</sup>             |
| Nickel, mine output, Ni content |                            | Zambales Diversified Metals Corp.                                                                                                             | Santa Cruz-Candelaria nickel project in Zambales Province                                                                   | 1,000. <sup>1</sup>          |
| Do.                             |                            | CTP Construction & Mining Corp.                                                                                                               | Adlay-Cagdianao-Tandawa (ACT) nickel project at Barangay Adlay, Municipality of Carrascal, Surigao del Sur Province         | 10,000.                      |
| Do.                             |                            | Hinatuan Mining Corp.                                                                                                                         | South Dinagat project on Nonoc Island                                                                                       | 4,000. <sup>1</sup>          |
| Do.                             |                            | do.                                                                                                                                           | Tagana-an nickel project on Hinatuan Island                                                                                 | 30,000.                      |
| Do.                             |                            | Cagdianao Mining Corp., and Platinum Group Metals Corp.                                                                                       | Cagdianao nickel project near Barangay Valencia on Dinagat Island                                                           | 42,000.                      |
| Do.                             |                            | Libjo Mining Corp.                                                                                                                            | Libjo laterite mining project in San Antonio of Libjo, Dinagat Islands                                                      | NA.                          |
| Do.                             |                            | Nickel Asia Corp., 60%; Pacific Metals Co. Ltd., 36%; Sojitz Philippines, 4%                                                                  | Rio Tuba nickel project at Barrio Rio Tuba, Municipality of Bataraza, Palawan Province                                      | 5,000.                       |
| Do.                             |                            | SR Metals, Inc.                                                                                                                               | SR nickel project, Tubay Mine at Tubay, Agusan del Norte Province, Mindanao Island                                          | 25,000. <sup>1</sup>         |
| Do.                             |                            | Berong Nickel Corp.                                                                                                                           | Berong nickel project, Palawan Island, Palawan Province                                                                     | 10,000. <sup>1</sup>         |
| Do.                             |                            | Agata Mining Ventures Inc. (TVI Resources Development (Philippines), Inc., 60%, and Mindoro Resources Ltd., 40%)                              | Agata nickel laterite project, Agusan del Norte Province, Mindanao Island                                                   | NA. <sup>1</sup>             |
| Nickel, plant output            |                            | Coral Bay Nickel Corp. (Sumitomo Metal Mining Co. Ltd., 54%; Mitsui & Co. Ltd. 18%; Rio Tuba Nickel Mining Corp., 10%; Nickel Asia Corp., 6%) | Coral Bay nickel high-pressure acid-leach (HPAL) plant on Palawan Island                                                    | 24,000 nickel, 1,800 cobalt. |
| Do.                             |                            | Taganito Mining Corp. (Nickel Asia Corp., 65%; Pacific Metals Co. Ltd., 33.5%; Sojitz Philippines, 1.5%)                                      | Claver nickel project (Taganito), nickel high-pressure acid-leach (HPAL) plant, Surigao del Norte Province, Mindanao Island | 70,000 nickel, 2,600 cobalt. |
| Petroleum, refinery output      | thousand 42-gallon barrels | Petron Corp.                                                                                                                                  | Limay, Bataan                                                                                                               | 67,700.                      |
| Silver, mine output, Ag content | kilograms                  | APEX Mining Company Inc.                                                                                                                      | APEX Maco operation, Compostela Valley, Mindanao Island                                                                     | 8,000.                       |
| Do.                             | do.                        | Benguet Corp.                                                                                                                                 | Acupan contract mining project, Benguet Province                                                                            | 300. <sup>1</sup>            |
| Do.                             | do.                        | Carmen Copper Corp. (wholly owned by Atlas Consolidated Mining and Development Corp.)                                                         | Toledo Copper Complex (Carmen and Lutopan mining) in the Central Highlands of Cebu Island                                   | 3,000.                       |
| Do.                             | do.                        | Greenstone Resources Corp. (affiliated with Red 5 Philippines Ltd.)                                                                           | Siana gold project, Surigao del Norte Province, Mindanao Island                                                             | 1,000.                       |
| Do.                             | do.                        | Lepanto Consolidated Mining Co.                                                                                                               | Victoria and Teresa Mines at Mankayan, Benguet Province                                                                     | 4,000. <sup>1</sup>          |
| Do.                             | do.                        | OceanaGold Philippines Inc.                                                                                                                   | Didipio copper-gold project on the north of Luzon Island in northern Philippines                                            | 9,000. <sup>1</sup>          |
| Do.                             | do.                        | Philex Gold Inc. (Philex Mining Corp.), 81%                                                                                                   | Padcal Mine (Santo Tomas II deposit) at Tuba, Benguet Province, Luzon Island                                                | 5,000.                       |
| Do.                             | do.                        | Philippines Gold Processing & Refining Corp.                                                                                                  | Masbate gold project, 350 kilometers south of Manila, Masbate Province                                                      | 5,000.                       |
| Do.                             | do.                        | TVI Resources Development Philippine Inc., 100%                                                                                               | Canatuan mining project located east of Siocon, Zamboanga del Norte Province, Mindanao Island                               | 500. <sup>1</sup>            |

Do., do. Ditto. NA Not available.

<sup>1</sup>Properties under suspended status since September 2016.

<sup>2</sup>Produced from stockpile since 2014.