



# 2017–2018 Minerals Yearbook

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## BOLIVIA

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# THE MINERAL INDUSTRY OF BOLIVIA

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**Note: In this chapter, information for 2017 is followed by information for 2018.**

In 2017, Bolivia was a globally significant supplier of ores and mineral concentrates and was among the world's leading producers of tin (6% share), and silver (5% share). Bolivia was also a globally significant producer of antimony, arsenic, boron (ulexite), lead, tungsten, and zinc. Other mineral commodities produced in the country included (but were not limited to) barite, bismuth, bentonite, boric acid, cement, copper, crude petroleum, gold, gypsum, rock salt, and tantalum. Bolivia had significant reserves of antimony, which were estimated to be 21% of the world's estimated total of 1.5 million metric tons (t). Bolivia's resources of lithium were estimated to be 9 million metric tons (Mt) (Anderson, 2019; Bennett, 2019; Jaskula, 2019).

In 2017, Bolivia maintained economic stability by controlling inflation and carrying out expansionary fiscal policies. The country continued its efforts to encourage growth locally despite weaker economies in surrounding countries. Bolivia was able to maintain its healthy economy even with low international prices for raw materials and a decrease in its exports of natural gas. Overall, Bolivia maintained a steady financial system as well as economic and social stability. Regionally, among South American countries, Bolivia registered one of the highest economic growth rates in the region. This was owing in part to improvements in the country's monetary and fiscal policies, a successful year for the agricultural sector, and strong domestic consumption. According to the Banco Central de Bolivia [Central Bank of Bolivia], the country's main driver of economic activity since 2006 has been local consumption and domestic investment (Banco Central de Bolivia, 2018h, p. 1–2, 4; International Monetary Fund, 2018; World Bank, The, 2018; Economic Commission for Latin America and the Caribbean, 2019a).

## Minerals in the National Economy

The decrease in natural gas exports was mainly attributed to lower demand from Brazil in the first half of the year; however, Brazil was the leading recipient of Bolivia's hydrocarbon exports in terms of value. In 2017, Bolivia's gross domestic product (GDP) at current prices was valued at \$37.8 billion, representing an annual growth rate of 10.5% compared with about 3% in 2016. Mining and quarrying activities accounted for 9% of the GDP, although it was Bolivia's weakest performing sector. In 2017, the sector's contribution to the GDP decreased for the third consecutive year, or by 0.6%. The decrease in recent years was attributed to weak regional economies and lower global commodity prices. The agriculture, hunting, and forestry sectors had the strongest performance in 2017 (increased by a combined 8%), followed by the construction sector (increased by 5%). The mineral industry was estimated to have employed nearly 135,000 workers (Banco Central de Bolivia, 2018h, p. 1–2; Economic

Commission for Latin America and the Caribbean, 2018a–c; 2019a, d).

In 2017, foreign direct investment (FDI) in all sectors combined in Bolivia more than doubled, to \$725 million from \$335 million in 2016. The Economic Commission for Latin America and the Caribbean noted that increased investment was recorded for the hydrocarbon and mining sectors, which attracted 32%, and 21% of total FDI, respectively. The largest FDI transaction recorded in 2017 was the acquisition of Empresa Minera Alcira S.A. by New Pacific Metals Corp. of Canada. Empresa Minera Alcira owned seven silver and polymetallic mineral properties in Bolivia. The transaction was valued at \$36 million (Economic Commission for Latin America and the Caribbean, 2018b, p. 52, 64).

## Government Policies and Programs

The Ministerio de Minería y Metalurgia [Ministry of Mining and Metallurgy] is the agency responsible for directing and developing the mining and metallurgical industries; it also oversees the implementation of policies and regulations that make up the legal framework for mining and metallurgical activities in the country. The Agencia Nacional de Hidrocarburos [National Hydrocarbon Agency] is the agency responsible for regulating, monitoring, and supervising the entire hydrocarbon supply chain, including exploration, production, marketing, and consumption (Agencia Nacional de Hidrocarburos, 2019; Ministerio de Minería y Metalurgia, 2019).

Law 535—Ley de minería y metalurgia [Law of mining and metallurgy] of May 28, 2014, was established to regulate the mining and metallurgical industry in Bolivia. It establishes the guidelines and procedures for granting, holding, and revoking mining rights; for the development of projects; and for conducting mining and metallurgical activities in a responsible, planned, and sustainable manner. According to Law 535, all mineral resources in the ground belong to the people of Bolivia and are administered by the state (Ministerio de Minería y Metalurgia, 2018, p. 25).

In 2008, Bolivia started developing plans for the implementation of the “National Strategy for the Industrialization of Evaporite Resources,” which gave way to Decree No. 29496. The decree started the industrialization of Bolivia's evaporite resources through the Gerencia Nacional de Recursos Evaporíticos [National Evaporite Resources Management] (GNRE), which was the Government agency responsible for managing the evaporite resources of the Salar de Uyuni. Government-owned Corporación Minera de Bolivia [Bolivian Mining Corp.] (COMIBOL) is the body responsible for the development of the evaporite resources of the Salar, which consists of salt flats rich in lithium. Until mid-year 2017,

the GNRE operated under COMIBOL (Mazumdar, 2017; Yacimientos de Litio Bolivianos, 2021).

In April 2017, the Government approved Law 928—Ley de la Empresa Pública Nacional Estratégica de Yacimientos de Litio Bolivianos (YLB) [Law of the National Public Company for Bolivian Lithium Deposits]. Under Law 928, the state-owned company YLB was created to replace the GNRE. YLB operates under the Ministry of Energy, and its tasks include promoting the country's lithium mineral deposits and carrying out all activities related to the development of evaporitic resources (brines), including prospecting for, exploring for, and mining lithium resources. YLB is tasked to develop the processing protocols for evaporite resources, including the production and commercialization of various products, such as lithium carbonate, lithium chloride, lithium hydroxide, and lithium sulfate, as well as potassium chloride, potassium nitrate, potassium sulfate, and other derivatives and intermediate salts and products associated with evaporites (Asamblea Legislativa Plurinacional, 2017; Yacimientos de Litio Bolivianos, 2021).

## Production

In 2017, refined lead production increased to 1,160 t from 41 t in 2016; the increase was driven mainly by the restarting up of the Government-owned Karachipampa smelter and refinery plant in February (Corporación Minera de Bolivia, 2017). The production of ametrine, a semiprecious gemstone, increased to 1,628 kilograms (kg) from 315 kg in 2016. The production of refined gold increased by about 133% to 1,400 kg from 600 kg in 2016, whereas mined gold increased by 130% to 29,524 kg from 12,811 kg in 2016. Other mineral commodities that showed significant production increases in 2017 were barite, by 75%; amethyst, 46%; mined lead, 25%; and ulexite, 14%. On the other hand, bentonite production decreased by 87% compared with that of 2016, bismuth production decreased by 79%, and gypsum production decreased by 60%. Other mineral commodities that showed significant decreases in production in 2017 were asphalt, by 33%; mined copper, 32%; rock salt, 26%; refined silver, 21%; kerosene, 13%; mined silver and boric acid, 12% each; and tungsten (W content), 10%. Data on mineral production are in table 1.

## Structure of the Mineral Industry

In addition to the functions carried out by the Ministerio de Minería y Metalurgia, the mineral sector in Bolivia is administered as follows: the Autoridad Jurisdiccional Administrativa Minera (AJAM) [Mining Administrative Jurisdictional Authority] is in charge of the management and supervision of mining activities in the country, and it maintains the mining registry; COMIBOL and its subsidiaries oversee all public mining companies; the Servicio Geológico Minero [Geological Mining Survey] (SERGEOMIN), Centro de Investigaciones Minero Metalúrgicas [Mining and Metallurgical Research Center] (CEIMM), and Servicio Nacional de Registro y Control de la Comercialización de Minerales y Metales [National Service for the Registration and Control of the Marketing of Minerals and Metals] (SENARECOM) are the entities that regulate, research, and service the mining sector;

and Fondo de Apoyo a la Reactivación de la Minería Chica [Support Agency for the Reestablishment of Small Mining] (FAREMIN), and Fondo de Financiamiento para la Minería Cooperativa [Fund for the Financing of Cooperative Mining] (FOFIM) serve as the financial benefactors in the mining sector by granting loans (Ministerio de Minería y Metalurgia, 2018, p. 43). COMIBOL is responsible for ensuring that the rules regarding the right to commercialize mining activities are followed. COMIBOL also oversees other mining activities, such as concentration, refining, and smelting; and exploration and prospecting for and mining of minerals, metals, and precious and semiprecious stones present in the mining areas under its administration and those of its subsidiary companies. COMIBOL finances its mining operations with its own resources or resources obtained through credits from private or public banking, credit securities institutions, or external financing according to Article 50 of law No. 466 (Law of Public Companies) of December 26, 2013 (Ministerio de Minería y Metalurgia, 2018, p. 56).

COMIBOL's partially or wholly owned mines included the Corocoro copper mine [jointly owned by Korea Resources Corp. of the Republic of Korea (53%) and COMIBOL through Empresa Minera Corocoro (47%)]; the Huanuni tin mine (100% owned by COMIBOL through its subsidiary Empresa Minera Huanuni); the Bolívar and Porco indium, lead, silver, and zinc mine [a joint venture between COMIBOL (55.45%) and Glencore plc of Switzerland through its wholly owned subsidiary Sociedad Minera Illapa S.A. (45.55%)]; and the Colquiri silver, tin, and zinc mine (100% owned by COMIBOL through its subsidiary Empresa Minera Colquiri).

Sumitomo Corp. of Japan's wholly owned subsidiary Empresa Minera San Cristóbal S.A. operated the San Cristóbal lead, silver, and zinc mine, which is located in Potosí Department. Glencore owned the Sinchi Wayra S.A. group of mines, which operated the Asientos, the Caballo Blanco, the Colquechaquita, the Comsur, the Poopo, the San Lorenzo, and the Tres Amigos Mines. The mines, all of which are located in Potosí Department, produced mainly tin and zinc (with some lead and silver). Table 2 is a list of the major mineral industry facilities (Glencore plc, 2017, p. 197; Sumitomo Corp., 2017, p. 159).

## Mineral Trade

The total value of exports from Bolivia increased by about 16% in 2017 to \$8.1 billion from \$7.0 billion in 2016. Hydrocarbon exports, which included crude petroleum, gasoline, liquefied gas, and natural gas, increased by 23% in 2017 to \$2.7 billion from \$2.2 billion in 2016 and accounted for 35% of total exports. Both natural gas and petroleum were exported, but natural gas exports of \$2.6 billion accounted for 96% of the value of hydrocarbon exports in 2017. The value of nonfuel mineral exports increased by about 19% in 2017 to \$3.7 billion from \$3.1 billion in 2016 and accounted for 47% of the total value of exported goods. In 2017, Bolivia's leading nonfuel mineral export commodities were, in descending order of export value, zinc, gold, and silver, for a combined total of \$3 billion. Other nonfuel mineral commodities that were exported included antimony, copper, lead, tin, and tungsten (Banco Central de Bolivia, 2018d, e, i).

In 2017, lead had the highest percentage increase in terms of value among nonfuel mineral exports; it increased by 53% to about \$246.5 million from \$161.0 million in 2016. Other exported nonfuel mineral commodities that had value increases in 2017 included zinc, which increased by 37% to about \$1.4 million; antimony, by 37% to \$23.2 million; and nonmonetary gold, by 35% to \$1 million. On the other hand, the value of silver exports decreased by 13% to \$639 million, and that of alloys decreased by 13% to \$2.1 million. In terms of the value of nonfuel mineral exports in 2017, the Republic of Korea was the leading recipient (16%), followed by Japan (15%), India (15%), China (10%), and the United States (10%) (Banco Central de Bolivia, 2018b, e).

In 2017, reported exports of several mineral commodities exceeded reported production; available information was inadequate to determine whether this was the result of drawdowns in inventories or other factors. Of all mineral commodity exports, gold exports represented the greatest increase in terms of volume—by 33.2% to 25,700 kg—followed by lead, by 26.7% to 107,030 t; alloys, by 13.4% to 941 t; and antimony, by 6.6% to 2,844 t. Copper exports decreased by 22.8% to 4,721 t, followed by silver exports, by 13.5% to 1.2 million kilograms; tungsten exports, by 10% to 1,254 t; and tin exports, by 5.4% to 16,221 t (Banco Central de Bolivia, 2018c).

The largest percentage decrease in the value of hydrocarbon exports in 2017 was that of crude petroleum, which decreased by 27% to \$51.2 million from \$70.0 million in 2016. The value of natural gas exports increased by 26% from \$2.0 billion in 2016. The value of other hydrocarbon exports increased by 37.4% to \$46.3 million. In 2017, the leading destination (in terms of value) for Bolivia's hydrocarbon exports was Brazil followed by Argentina; together, these two countries accounted for 95% of the total of \$2.7 billion. Bolivia also exported hydrocarbons to the United States; the value of these exports was \$36 million (Banco Central de Bolivia, 2018a, d, e).

Bolivia's total exports to the United States were valued at about \$567 million in 2017, of which mineral and mineral-related commodities were valued at about \$371 million. The top three mineral-related commodity exports were tin, which was valued at \$133 million; nonmonetary gold, \$74 million; and other precious metals, \$73 million; noteworthy others included steelmaking materials valued at \$24 million; copper, \$10 million; sulfur and nonmetallic minerals, \$6 million; nonferrous metals, \$5 million; and bauxite and aluminum, \$1.5 million (Banco Central de Bolivia, 2018e; U.S. Census Bureau, 2018b).

In 2017, the value of goods imported to Bolivia increased by 9.3% to \$8.6 billion. The increase was driven primarily by an increase in imports of capital goods for agriculture, industrial manufacturing, and transportation, the aggregate value of which increased by 10% to \$3.3 billion from \$3 billion in 2016. The leading countries of origin of all imports to Bolivia in 2017 were China (22%), Brazil (17%), Argentina (12.5%), and the United States (8%), which together accounted for 59% of the total value (Banco Central de Bolivia, 2018f, g).

Bolivia's imports from the United States as reported by the U.S. Census Bureau were valued at \$594.7 million in 2017, of which mineral and mineral-related commodities were valued at about \$51 million. The mineral and mineral-related

commodities were further itemized as other petroleum products, \$20 million; fuel oil, \$11 million; aluminum and alumina, \$7.6 million; finished metal shapes, \$7.5 million; iron and steel products, about \$3 million; and nonmonetary gold, \$917,000 (U.S. Census Bureau, 2018a).

## Commodity Review

### Metals

**Copper, Gold, and Silver.**—Orvana Minerals Corp. of Canada through its subsidiary Empresa Minera Paititi S.A. (EMIPA) operated the Don Mario Mine complex that consisted of an open pit gold-copper-silver mine located in Santa Cruz Department in southeastern Bolivia. The Don Mario complex included the Cerro Felix open pit, the Las Tojas ore body, the lower mineralized zone (LMZ), the upper mineralized zone (UMZ), and processing facilities. Production of gold increased by 84% to about 1,200 kg during fiscal year 2017, which began on October 1, 2016, and ended on September 30, 2017. The increase in the production of gold was due to the mining of higher ore grades and increased recoveries at the processing plant primarily related to the initiation of production at the LMZ. Copper production, on the other hand, decreased by 20% to 4,200 t, and silver production decreased by 64% to about 4,200 kg owing to lower ore grades. In the first quarter of fiscal year 2017, Orvana announced that commercial production at the UMZ, which had begun in 2011, had ended. As the UMZ part of the project was phased out, gold production then started from the LMZ upper extension. The company projected that production from the LMZ would continue until the ore was depleted by the second quarter of 2018. The project would eventually be phased out, and the material mined was expected to be replaced with material from the Cerro Felix deposit by late 2018. The Cerro Felix deposit is located 500 meters from the Don Mario Mine. At the end of September 2017, the Don Mario Mine's measured and indicated reserves were a reported 2,184 Mt at average grades of 1.84 grams per metric ton (g/t) gold, 1.89% copper, and 49.3 g/t silver (table 2; Orvana Minerals Corp., 2017, p. 4, 8, 16–18).

Coeur Mining Inc. of the United States held mining rights through agreements with COMIBOL and several mining cooperatives for the operation of the San Bartolomé open pit silver mine, which is located in Potosí Department in southern Bolivia. The mine and associated milling operation had been in production by Empresa Minera Manquiri S.A. (Manquiri)—a wholly owned subsidiary of Coeur Mining—since 2008. In response to conflicts between the local mining cooperatives and the Government of Bolivia, the Government issued Supreme Decree No. 2891 on September 1, 2016, and Law 845 on October 24, 2016, which imposed tighter restrictions on mining cooperatives that did not comply with joint-venture agreements. Under the restrictions, cooperatives risked losing their mining leases if they do not comply with joint-venture agreements. By yearend 2017, Coeur entered into a share-purchase agreement to sell 100% of its shares in Manquiri, which included the San Bartolomé silver mine and the associated milling operations. The company expected to finalize the sale by 2018. In 2017, the San Bartolomé Mine's production of silver decreased by

21% to 133,745 kg; this production accounted for about 11% of Bolivia's total silver mine output in 2017 of 1,196,416 kg. As of December 31, 2017, proven mineral reserves of silver at the mine were a reported 1.6 Mt at an average grade of 78 g/t silver (Coeur Mining Inc., 2018, p. 4, 7, 27, 30).

Pan American Silver Corp. of Canada operated the San Vicente underground silver-zinc mine located in Potosí Department. Pan American Silver controlled 95% of the mine in a joint venture with COMIBOL, and the remaining 5% was held by Trafigura Beheer B.V. of Switzerland. In 2017, silver production at the San Vicente Mine decreased by about 19% to about 112,000 kg, which accounted for 9% of Bolivia's total silver mine output. The production shortfall was due to a combination of unscheduled downtime for plant maintenance and related issues and the decrease in the average silver grade owing to higher than anticipated mining dilution. As of December 31, 2017, proven reserves of silver at the mine were a reported 1.9 Mt at an average grade of 416 g/t of silver. The company was expected to produce between 121,000 kg and 127,000 kg of silver in 2018 (Pan American Silver Corp., 2018, p. 22, 23, 35–36, 71).

In July, New Pacific Holdings Corp. of Canada announced that its wholly owned subsidiary New Pacific Investment Corp. Ltd. had finalized the acquisition, through a share purchase agreement, of Empresa Minera Alcira S.A. The most studied project from Minera Alcira was the Silver Sand project located in Potosí Department. Six other projects were in the early stages of exploration. All of the projects under Minera Alcira had a record of being mined or drilled for assessments in the past by small-scale miners. After the acquisition of Alcira at a cost of \$45 million, New Pacific applied for licenses and permits for the mining and milling of the operations (New Pacific Holdings Corp., 2017).

**Lead.**—The Karachipampa smelter formally restarted operations in January 2017 following the testing of the equipment that took place in December 2016. The smelter produced lead ingots of 99.97% purity from lead ores produced in Bolivia. During the year, the plant processed concentrates from the San Cristobal Mine and from stockpiles previously left at the plant (Corporación Minera de Bolivia, 2017).

### **Industrial Minerals**

**Lithium and Potash.**—In 2017, Bolivia continued to make progress in developing its emerging lithium industry and planned to invest nearly \$1 billion by 2019. The country announced that YLB was in the process of developing a pilot lithium complex to extract lithium and potassium chloride from a 40-square-kilometer area in the Salar de Uyuni salt flats. The Salar de Uyuni is estimated to contain 9 Mt of lithium, which would account for about one-quarter of the world's known reserves. The Government planned to begin production of lithium carbonate by 2020; however, YLB planned to release more details about its plans at a later time (Mazumdar, 2017).

### **Mineral Fuels**

**Natural Gas.**—In October 2017, Gazprom EP International B.V., Gazprom Marketing & Trading Ltd., Bolivia's Ministry

of Hydrocarbons and Energy, and Yacimientos Petrolíferos Fiscales Bolivianos (YPFB) signed a memorandum of understanding for the continuation of the development of the Incahuasigas field and for arrangement of a joint venture for gas marketing in Argentina and Brazil. The drilling locations identified for prospecting wells were at the Azero licensed block. The parties also discussed the prospects for a joint venture to develop natural gas and small-scale liquefied natural gas (LNG) projects (Gazprom EP International B.V., 2017).

Total S.A. of France started natural gas production at the Incahuasi gas field (phase I) in August 2016. Total held a 50% ownership in the field along with OAO Gazprom, 20%; Tecpetrol S.A. of Uruguay, 20%; and YPFB, 10%. In 2017, Total had seven licenses in Bolivia, which included three production licenses at San Alberto, San Antonio, and Block XX Tarija Oeste; two licenses in the development phase at Aquio and Ipati; and two exploration phase licenses at Azero and Rio Hondo. The company relinquished the Rio Hondo license in June 2017. The Incahuasi gasfield is located within the Aquio and Ipati Blocks about 280 kilometers (km) south of Santa Cruz. The Incahuasi gasfield was initially discovered in 2004, and phase I development was started in 2013. Total's natural gas production in Bolivia in 2017 averaged 46,000 barrels of oil equivalent per day (boe/d) compared with 34,000 boe/d in 2016 (Total S.A., 2018, p. 43).

Production at Incahuasi was expected to reach up to 6.9 million cubic meters per day of natural gas. In addition, Total noted that the development of phase II of the Incahuasi gasfield was under consideration and would likely be launched in early 2018. Phase II was expected to cost \$980 million to develop and, upon completion, would produce 6.5 million cubic meters per day of natural gas. Phase II of the project was expected to take 4 years to complete (Total S.A., 2017, p. 21).

## **MINERAL INDUSTRY HIGHLIGHTS IN 2018**

In 2018, the GDP growth in the mining and quarrying sector in Bolivia was 3.4%. The mining and quarrying sector accounted for about 11% of the GDP. The agriculture, hunting, and forestry sector had the strongest increase in 2018 at 6.9%, followed by the construction sector, at 3.5% (Banco Central de Bolivia, 2019c, p. 2–3; Economic Commission for Latin America and the Caribbean, 2019b, c).

The total value of exports from Bolivia increased to \$8.9 billion, or by about 10% in 2018 compared with that of 2017. Hydrocarbon exports increased by 15% to \$3.1 billion and accounted for 35% of total exports. Both natural gas and crude petroleum were exported in 2018; however, natural gas exports of nearly \$3 billion accounted for most of the value of hydrocarbon exports. The value of nonfuel mineral exports increased to \$4 billion in 2018 from \$3.7 billion in 2017, or by about 3%, and accounted for 45% of the total value of exported goods. In 2018, Bolivia's leading nonfuel mineral export commodities were, in terms of value, zinc (\$1.5 billion), gold (\$1.2 billion), and silver (\$602 million), for a combined total of \$3.3 billion. Other nonfuel mineral commodities that were exported included antimony, copper, lead, tin, and tungsten (Banco Central de Bolivia, 2019a).

Bolivia's total exports to the United States were valued at about \$486 million in 2018 compared with \$567 million in 2017. Mineral and mineral-related commodities accounted for about \$323 million in 2018, of which the top three mineral-related commodities were tin valued at \$130 million; other precious metals, \$80 million, and nonmonetary gold, \$23 million. Other commodities included steelmaking materials valued at \$38 million; copper, \$10 million; sulfur and nonmetallic minerals, \$7 million; and bauxite and aluminum, \$2 million (U.S. Census Bureau, 2019b).

In 2018, the value of Bolivia's imported goods increased by 8.5% to \$9.4 billion. The increase was driven mainly by an increase in imports of capital goods for agriculture, industrial manufacturing, and transportation, the aggregate value of which increased by 41% to \$4.8 billion from \$3.4 billion in 2017 (Banco Central de Bolivia, 2019b).

According to the U.S. Census Bureau, Bolivia's imports of U.S. goods were valued at \$562 million in 2018, of which mineral and mineral-related commodities were valued at about \$32 million. Within the mineral and mineral-related commodities category, the top three mineral-related commodities were other petroleum products, which were valued at \$21 million; finished metal shapes, \$6 million; and aluminum and alumina, \$2 million. Others included iron and steel products valued at about \$1.6 million, and nonmetallic minerals, \$785,000 (U.S. Census Bureau, 2019a).

## Production

In 2018, the production of arsenic trioxide increased to 238 t from 20 t in 2017; production of tantalite concentrate increased to 58,800 kg from 8,533 kg; and production of tantalum increased to 14,400 kg from 2,100 kg. The production of bismuth (refinery) increased by 387%, and production of bismuth ore and concentrate increased by 283%. Other commodities with significant production increases in 2018 were gypsum, by 140%; barite, 83%; salt, 60%; copper (electrowon) and tungsten, 37% each; and amethyst, 10%. On the other hand, the production of bentonite decreased by 98% compared with that of 2017; copper concentrate, by 75%; ametrine 71%; and refined lead, 45% (table 1).

## Commodity Review

### Metals

**Copper, Gold, and Silver.**—In 2018, Orvana's mining activities at the Don Mario Mine transitioned from a depleted LMZ to the Cerro Felix gold satellite deposit. Gold production from the mine in fiscal year 2018 increased by about 17% to 1,400 of kg gold (reported as 45,125 troy ounces). The increase in production was owing mainly to increased gold recovery and higher volumes of ore milled. On the other hand, the production of copper and silver in this facility decreased by 63% and 58%, respectively, compared with that of 2017, owing mainly to low recovery rates. The company discontinued the recovery of copper using the flotation method and shifted its interests to gold production. In 2019, Orvana planned to mine other sections

of the Cerro Felix gold deposit (Orvana Minerals Corp., 2018, p. 5, 9, 22).

In February, Coeur announced the completion of the sales agreement for its outstanding stocks of Empresa Minera Manquiri, the operator of the San Bartolomé Mine. The operation was sold to Ag-Mining Investments, AB of Sweden at an estimated cost of about \$25 million (Coeur Mining Inc., 2019, p. 5, 26, 83, 110).

**Iron and Steel.**—In 2018 the Government planned to start the construction of the first integrated steel complex at the Mutun iron deposit, which is located in Puerto Suarez, Santa Cruz. Sinosteel Equipment Co. of China was tasked with managing the construction phase of the project. The \$500 million project was financed by the Eximbank of China (85%), and the Government of Bolivia (15%). The state would keep 100% ownership of the property. When commissioned, the project is expected to produce about 194,000 metric tons per year (t/yr) of rolled steel, which was estimated to be able to supply about 50% of Bolivia's domestic demand starting in 2021. In a 5-year period, production could reach targets of 450,000 t/yr of nonflat laminates and 550,000 t/yr of flat laminates, in addition to sponge iron. In addition to the steel plant, the integrated steel complex to be built by Sinosteel would include a 120-km aqueduct for water supply and a 15-km gas pipeline (Sputnik Mundo, 2018; El Deber, 2019).

### Industrial Minerals

**Lithium and Potash.**—In 2018, Bolivia, through the state-owned YLB, chose ACI Systems GmbH of Germany as a partner for the development of Bolivia's lithium resources. The agreement between the parties included the construction of a plant for the production of lithium carbonate based on residual brine and of another plant for the production of industrial cathode materials and batteries. ACI Systems planned to invest approximately \$1.3 billion for the construction of the two plants. In the long run, the consortium had plans to build a total of four lithium plants in the Salar de Uyuni. Most of the production was expected to be exported to Europe, mainly to the automotive sector (Ariñez, 2018).

## Outlook

As projected by the International Monetary Fund, Bolivia's GDP growth is expected to remain within an average of 4% through 2020 (International Monetary Fund, 2019). The continued development of the country's lithium reserves, especially from the Government's partnership with ACI Systems and the planned investment of \$1.3 billion in lithium production could provide a boost to the country's economy. The first steel complex in Bolivia is expected to start production in 2021 and will potentially help Bolivia reduce its dependence on steel imports. For the foreseeable future, hydrocarbon exports are expected to be Bolivia's main trade commodity.

The "National Economic and Social Development Plan 2016–2020" was approved in 2016 with the objectives of maintaining growth, continuing to reduce poverty rates, and improving the country's access to basic services. The plan

encompasses a broad public investment program, which includes investments in infrastructure, hydrocarbon exploration, industrialization of natural gas, and thermal and hydroelectric energy generation. The plan also calls for greater integration for investments from the private sector and foreign investors. FDI in many sectors of the country's economy has increased in recent years, especially in the construction and the mining and quarrying sectors. Bolivia has also seen some progress in the recovery of the value and volume of its exports, which had contributed positively to the economies of South American countries, and this trend is expected to continue in the foreseeable future (World Bank, The, 2018).

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

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2014	2015	2016	2017	2018
METALS					
Antimony:					
Mine, Sb content	4,186	3,843	2,669	2,881	3,110
Refinery, metal and trioxide	3,488 <sup>r</sup>	3,089 <sup>r</sup>	2,334 <sup>r</sup>	2,410	2,501
Bismuth:					
Ore and concentrate	11	20	28	6	23
Refinery	24	--	8	8	39
Copper:					
Mine, Cu content, concentrates	8,936 <sup>r</sup>	7,690 <sup>r</sup>	6,519 <sup>r</sup>	4,450	1,095
Refinery, leaching, electrowon	1,810	1,789	2,199	2,269	3,114
Gold:					
Mine, Au content <sup>3</sup>	24,803	12,810	12,811	29,524	29,976
Refinery, primary <sup>c</sup>	1,200	600	600	1,400	1,400
Lead:					
Mine, Pb content	78,509	75,273	89,510	111,566	112,140
Refinery, primary	300 <sup>c</sup>	459	41	1,160	635
Niobium and tantalum, mine, tantalite concentrate:					
Gross weight	22,947	1,276	--	8,533	58,800
Ta content	5,640	314	--	2,100	14,400
Silver:					
Mine, Ag content <sup>4</sup>	1,398,163	1,306,098	1,353,202	1,196,416	1,191,024
Refinery, primary	212,396	169,782	194,443	152,974	159,723
Tin:					
Mine, Sn content	19,791	20,135	17,460	18,341	17,251
Smelter, primary	15,439	15,464	16,810	16,648	15,611
Tungsten, mine, concentrate, W content					
1,252	1,460	1,110	994	1,365	
Zinc, mine, Zn content					
474,988	442,154	486,955	527,206	519,630	
INDUSTRIAL MINERALS					
Arsenic trioxide <sup>5</sup>					
52	33	38	20	238	
Barite	26,240 <sup>r</sup>	46,732	16,632	29,114	53,163
Boron:					
Boric acid	16,388	17,713	17,239	15,127	15,865
Ulexite, natural	151,799	148,738	182,685	208,388	216,403
Cement:					
Clinker	1,700	1,700	1,750 <sup>c</sup>	1,750 <sup>c</sup>	1,750 <sup>c</sup>
Hydraulic	3,337	3,468	3,601	3,611	3,650 <sup>c</sup>
Clay, bentonite	886	1,023	525	68	2
Gemstones:					
Amethyst, rough <sup>6</sup>	188,704	242,641	152,154	221,585	243,487
Ametrine, boliviarite, rough	856	824	315	1,628	474
Gypsum <sup>5</sup>	1,464	650	1,182	473	1,136
Salt, rock salt	2,835 <sup>s</sup>	2,216 <sup>s</sup>	4,534 <sup>s</sup>	3,358	5,373
MINERAL FUELS AND RELATED MATERIALS					
Natural gas liquids	4,500	4,457 <sup>r</sup>	4,289 <sup>r</sup>	4,200	4,200 <sup>c</sup>
Natural gas:					
Gross	22,386	22,174	21,336	21,300	21,300 <sup>c</sup>
Marketable	22,188	21,998	21,144	20,532	20,500 <sup>c</sup>

See footnotes at end of table.

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

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2014	2015	2016	2017	2018
<u>MINERAL FUELS AND RELATED MATERIALS—Continued</u>					
Petroleum:					
Crude	thousand 42-gallon barrels	18,639	17,907 <sup>r</sup>	16,572 <sup>r</sup>	15,722
Refinery:					
Asphalt	do.	10	7 <sup>r</sup>	15 <sup>r</sup>	10
Distillate fuel oil, including diesel	do.	5,646 <sup>r</sup>	6,323 <sup>r</sup>	5,821 <sup>r</sup>	5,327
Gasoline:					
Aviation	do.	49	38	34	37
Motor	do.	6,877 <sup>r</sup>	6,904 <sup>r</sup>	8,848 <sup>r</sup>	8,659
Jet fuel	do.	1,413	1,497 <sup>r</sup>	1,481 <sup>r</sup>	1,489
Kerosene	do.	118	124	138	120
Liquefied petroleum gas <sup>e</sup>	do.	300	300	300	300
Lubricants:					
Automotive	do.	154 <sup>r</sup>	151 <sup>r</sup>	159 <sup>r</sup>	153
Greases	do.	3 <sup>r</sup>	2	2	2 <sup>e</sup>
Total		14,600 <sup>r</sup>	15,300 <sup>r</sup>	16,800 <sup>r</sup>	16,100
					16,100

<sup>a</sup>Estimated. <sup>r</sup>Revised. do. Ditto. -- Zero.

<sup>1</sup>Table includes data available through October 10, 2019. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>In addition to the commodities listed, indium, iron ore, manganese and a variety of industrial minerals (crushed and broken stone, dimension stone, lime, sand and gravel, native sulfur, and quartz) may have been produced, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>May include production of metallic gold.

<sup>4</sup>May include production of metallic silver.

<sup>5</sup>Exported production.

TABLE 2  
BOLIVIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity <sup>c</sup>
Antimony	Amalgamated Gold and Silver Inc., 70%, and Raptor Ventures LLC (Planet Resource Recovery Inc., 100%), 30%		San Antonio de Turiri Mine, Potosi Department	30,000
Do.	Small-scale mining operations and cooperatives (private, 100%)		San Jose Mine, Oruro Department; mines in Caracata District, Nor Chichas, Quijarro, and Sud Chichas Provinces, Potosi Department	4,500
Do.	Empresa Minera Unificada S.A. (EMUSA) (private, 100%)		Caracata, Chilcobia, and Espiritu Santo Mines, Potosi Department	1,100
Antimony, metal (regulus)	Empresa Metalúrgica Vinto S.A. (Government, 100%)		Vinto antimony plant, Carretera Vinto, Oruro Department	6,000
Antimony, metal	Empresa Minera Unificada S.A., 100%		City of Oruro, Oruro Department	1,100
Do.	Operaciones Metalúrgicas S.A. (private, 100%)		Huajara Industrial Park, east Oruro, Oruro Department	3,000
Arsenic trioxide	Empresa Minera Bernal Hermanos S.A. (private, 100%)		Palala smelter, Tupiza, Potosi Department	1,900
Bismuth	Cooperativa Minera Locatarios Tasna Ltda.		Tasna Mine, near Oruro, Oruro Department	200
Bismuth, refined	Corporación Minera de Bolivia (COMIBOL) (Government, 100%)		Telamayu bismuth refinery, Telamayu, Potosi Department	350
Do.	Empresa Metalúrgica Vinto S.A. (Government, 100%)		Vinto smelting complex, Carretera Vinto, Oruro Department	90
Cement	thousand metric tons	Cooperativa Boliviana de Cemento Ltda.	Irpa Irpa plant, near Cochabamba	825
Do.	do.	Fábrica Nacional de Cemento S.A. (FANCES) (Chuquisaca Provincial Government, 33.34%; Municipal Government of Sucre, 33.33%; Universidad San Francisco Xavier de Chuquisaca, 33.33%)	Cal Orcko industrial complex near Sucre, including grinding plant, and FANCES cement plant near Chuquisaca	1,100
Do.	do.	ITACAMBA Cemento S.A.	Plant, Santa Cruz Department	200
Do.	do.	Sociedad Boliviana de Cemento S.A. (Consorcio Cementero del Sur S.A., 47.02%, and other private, 52.98%)	El Puente (near Tarija), Emisa (near Oruro), Viacha (near La Paz), and Warnes (near Santa Cruz) plants	1,800
Copper		Compañía Minera PAS (Bolivia) S.A. [Pan American Silver Corp. joint venture with Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 95%, and Trafigura Beheer B.V., 5%]	San Vicente Mine, Potosi Department	700
Do.		Empresa Minera Paititi S.A. {Orvana Minerals Corp. [Fabulosa Mines Ltd. (Minera S.A., 100%), 52.5%, and other private, 47.5%], 100%}	Don Mario Mine, Chiquitos Province, Santa Cruz Department	7,000
Do.		Minera Corocobre S.A. [Korea Resources Corp. 53%, and Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 47%]	Corocoro Mine, La Paz Department	3,600
Do.		Small-scale mining operations and cooperatives (private, 100%)	Mining operations in Chuquisaca, La Paz, Oruro, and Potosi Departments	650
Gemstones, ametrine		Minerales y Metales del Oriente S.R.L.	Anahi Mine, Santa Cruz Department	NA
Gold	kilograms	Empresa Minera Inti Raymi S.A. (Compañía Procesadora de Minerales S.A., 88%, and Zeland Mines S.A., 12%)	Kori Chaca open pit mine and Kori Kollo leaching plant, near Oruro	1,000
Do.	do.	Empresa Minera Paititi S.A. {Orvana Minerals Corp. [Fabulosa Mines Ltd. (Minera S.A., 100%), 52.5%, and other private, 47.5%], 100%}	Don Mario Mine, Chiquitos Province, Santa Cruz Department	2,300
Do.	do.	Grupo Minero La Roca S.A. (private, 100%)	La Paz Department	200
Do.	do.	Mining cooperatives (private, 100%)	Various mines in Tipuani, Guanay, Mapiri, Huayta, Kaka, and Teoponte Rivers, La Paz Department	4,350
Do.	do.	Threegold Resources Inc. (private, 100%)	Cangalli Mine, La Paz Department	150

See footnotes at end of table.

TABLE 2—Continued  
BOLIVIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity <sup>e</sup>
Indium, run of mine	Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 55.45%, and Sociedad Minera Illapa S.A. (Glencore plc, 100%), 45.55%		Bolivar and Porco Mines, Oruro and Potosi Departments	35
Do.	Compañía Minera PAS (Bolivia) S.A. [Pan American Silver Corp. joint venture with Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 95%, and Trafigura Beheer B.V., 5%]		San Vicente Mine, Potosi Department	15
Do.	Empresa Minera Colquiri [Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 100%]		Colquiri tin and zinc mine, Inquisivi Province, La Paz Department	5
Do.	Sinchi Wayra S.A. (Glencore plc, 100%)		Asientos, Caballo Blanco, Colquechaquita, Comsur, Poopo, San Lorenzo, and Tres Amigos Mines, Potosi Department	35
Lead	Compañía Minera PAS (Bolivia) S.A. [Pan American Silver Corp. joint venture with Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 95%, and Trafigura Beheer B.V., 5%]		San Vicente Mine, Potosi Department	300
Do.	Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 55.45%, and Sociedad Minera Illapa S.A. (Glencore plc, 100%), 45.55%		Bolivar and Porco Mines, Oruro and Potosi Departments	1,000
Do.	Corporación Minera de Bolivia (COMIBOL) (Government, 100%)		Cerro Rico Mine, Potosi Department, and in areas immediately surrounding the San Cristobal Mine	10,200
Do.	Empresa Minera San Cristóbal S.A. (Sumitomo Corp., 100%)		San Cristobal Mine, Potosi Department	82,000
Do.	Empresa Minera Santa Lucia Ltda.		Santa Lucia lead-silver-zinc mine, Potosi Department	200
Do.	Sinchi Wayra S.A. (Glencore plc, 100%)		Asientos, Caballo Blanco, Colquechaquita, Comsur, Poopo, San Lorenzo, and Tres Amigos Mines, Potosi Department	7,000
Lead, metal	Empresa Metalúrgica de Karachipampa [Corporación Minera de Bolivia (COMIBOL) (Government 100%)]		Karachipampa lead and silver smelter and zinc refinery, Potosi Department	51,000
Do.	Empresa Metalúrgica Vinto S.A. (Government, 100%)		Vinto smelting complex, Carretera Vinto, Oruro Department	120
Natural gas	million cubic meters	Operated by Empresa Petrolera Andina S.A. (Yacimientos Petrolíferos Fiscales Bolivianos (YPFB)-Andina S.A. [Government, 100%], 51.08%, and Repsol YPF, S.A., 48.92%) and owned by Empresa Petrolera Andina, S.A., 50%; Petróleo Brasileiro S.A., 35%; Total S.A., 15%	Los Sauces, Rio Grande, Sirari, Vibora, and Yapacani Fields, Santa Cruz Department	2,700
Do.	do.	Operated by Petróleo Brasileiro S.A. (Petrobras) (Government of Brazil, 32.2%, and private, 67.8%), and operation license owned by Total S.A., 41%; Petróleo Brasileiro S.A., 30%; BG Group plc., 25%; YPFB Chaco S.A., 4%	Itaú field, Block XX Tarija Oeste, Tarija Department	NA
Do.	do.	Operated by Petróleo Brasileiro S.A. (Petrobras in Bolivia) Owned by Yacimientos Petrolíferos Fiscales Bolivianos (YPFB)-Andina S.A. and Total E&P Bolivie, S.A.	Sábalo field, San Antonio Block; San Alberto Field and Block, Tarija Department	7,200
Do.	do.	Operated by Pluspetrol Bolivia Corporation S.A. (owned by Pluspetrol S.A., 100%)	Bermejo and Madrejones Fields, Tarija Department; Tacobo Field, Santa Cruz Department	520
Do.	do.	Operated by Repsol YPF, S.A., and owned by BG Group plc., 37.5%, Repsol YPF S.A., 37.5%; Pan American Energy LLC (BP p.l.c., 60%, and BRIDAS Corp., 40%), 25%	Margarita field, Caipipendi Block, Tarija Department; Paloma Field, Mamore Block, Cochabamba and Santa Cruz Departments	1,300

See footnotes at end of table.

TABLE 2—Continued  
BOLIVIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
Natural gas—	million cubic meters	Operated and owned by Shell Bolivia Corp., 100%	La Vertiente, Los Suris, and Tarija XX East blocks; La Vertiente gas processing plant, all located in Tarija Department	630
Continued				
Do.	do.	Shell Bolivia Corp., 37.5%	Caipipendi block (Margarita field), Tarija Department	NA
Do.	do.	Shell Bolivia Corp., 25%	Tarija XX West block (Itaú field), Tarija Department	NA
Do.	do.	Operated by Vintage Petroleum Boliviana Ltda. (owned by Occidental Petroleum Corp., 100%)	Chaco Sur and Ñupuco Fields, Tarija Department; Naranjillos Field, Santa Cruz Department	350
Do.	do.	Operated and owned by YPFB Chaco S.A. (Government, 100%)	Vuelta Grande field, Chuquisaca Department; Bulo Bulo, Carrasco and Kanata Fields, on the border of Cochabamba and Santa Cruz Departments	2,200
Do.	do.	Total S.A., 50%; OAO Gazprom, 20%; Tecpetrol S.A., 20%; Yacimientos Petrolíferos Fiscales Bolivianos (YPFB)-Andina S.A., 10%	Incahausi field, Aquio and Ipati Block, 280 kilometers southwest of Santa Cruz	2,373
Petroleum	thousand 42-gallon barrels	Operated by Empresa Petrolera Andina S.A. [Yacimientos Petrolíferos Fiscales Bolivianos (YPFB)-Andina S.A. (Government, 100%), 51.08%, and Repsol YPF, S.A., 48.92%] and owned by Empresa Petrolera Andina, S.A., 50%; Petróleo Brasileiro S.A., 35%; Total S.A., 15%	Los Sauces, Rio Grande, Sirari, Vibora, and Yapacani fields, Santa Cruz Department	2,100
Do.	do.	Operated by Petróleo Brasileiro S.A. (Petrobras) (Government of Brazil, 32.2%, and private, 67.8%), and owned by Empresa Petrolera Andina S.A., 50%; Petróleo Brasileiro S.A., 35%; Total S.A., 15%	Sábalo Field, San Antonio Block; San Alberto Field and Block, Tarija Department	7,500
Do.	do.	Operated and owned by YPFB Chaco S.A. (Government, 100%)	Vuelta Grande Field, Chuquisaca Department; Bulo Bulo, Carrasco and Kanata Fields, on the border of Cochabamba and Santa Cruz Departments	2,900
Do.	do.	Operated by Repsol YPF, S.A., and owned by BG Group plc., 37.5%; Repsol YPF S.A., 37.5%; Pan American Energy LLC (BP p.l.c., 60%, and BRIDAS Corp., 40%), 25%	Margarita field, Caipipendi Block, Tarija Department; Paloma Field, Mamore Block, Cochabamba and Santa Cruz Departments	5,000
Do.	do.	Operated and owned by BG Group plc., 100%	La Vertiente, Escondido and Taiguati Fields, La Vertiente Block; Los Suris Field and Block, all in Tarija Department	610
Do.	do.	Operated by Pluspetrol Bolivia Corporation S.A. (owned by Pluspetrol S.A., 100%)	Bermejo and Madrejones Fields, Tarija Department; Tacobo Field, Santa Cruz Department	160
Do.	do.	Operated by Vintage Petroleum Boliviana Ltda. (owned by Occidental Petroleum Corp., 100%)	Chaco Sur and Ñupuco Fields, Tarija Department; Naranjillos field, Santa Cruz Department	140
Petroleum refinery products	42-gallon barrels per day	Operated and owned by YPFB Refinación S.A. (Government, 100%)	Gualberto Villarroel refinery in Cochabamba	40,200
Do.	do.	do.	Guillermo Elder Bell refinery in Santa Cruz	24,600
Silver	kilograms	Compañía Minera PAS (Bolivia) S.A. [Pan American Silver Corp. joint venture with Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 95%, and Trafigura Beheer B.V., 5%]	San Vicente Mine, Potosí Department	140,000
Do.	do.	Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 55.45%, and Sociedad Minera Illapa S.A. (Glencore plc, 100%), 45.55%	Bolívar and Porco Mines, Oruro and Potosí Departments	19,000
Do.	do.	Empresa Minera Inti Raymi S.A. (Compañía Procesadora de Minerales S.A., 88%, and Zeland Mines S.A., 12%)	Kori Chaca open pit mine and Kori Kollo leaching plant, near Oruro	25,000
Do.	do.	Empresa Minera Manquiri S.A. (Ag-Mining Investments, AB, 100%)	San Bartolome Mine, by Cerro Rico, near Potosí, Potosí Department	233,000

See footnotes at end of table.

TABLE 2—Continued  
BOLIVIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>	
Silver— Continued	kilograms [Fabulosa Mines Ltd. (Minera S.A., 100%), 52.5%, and other private, 47.5%], 100%	Empresa Minera Paititi S.A. {Orvana Minerals Corp. [Fabulosa Mines Ltd. (Minera S.A., 100%), 52.5%, and other private, 47.5%], 100%}	Don Mario Mine, Chiquitos Province, Santa Cruz Department	26,000
Do.	do.	Empresa Minera San Cristóbal S.A. (Sumitomo Corp., 100%)	San Cristobal Mine, Potosi Department	526,000
Do.	do.	Empresa Minera Santa Lucia Ltda.	Santa Lucia lead, silver, and zinc mine, Potosi Department	30,000
Do.	do.	Sinchi Wayra S.A. (Glencore plc, 100%)	Asientos, Caballo Blanco, Colquechaquita, Comsur, Poopo, San Lorenzo, and Tres Amigos Mines, Potosi Department	93,000
Do.	do.	Small-scale mining operations and cooperatives (private, 100%)	Candelaria and other mines, Cerro Rico deposit, as well as in areas immediately surrounding the San Bartolome Mine (under construction), Oruro and Potosi Departments	280,000
Silver, metal	Empresa Metalúrgica de Karachipampa [Corporación Minera de Bolivia (Government, 100%), 100%]	Karachipampa lead-silver smelter and zinc refinery, Potosi Department	310	
Do.	Empresa Metalúrgica Vinto S.A. (Government, 100%)	Vinto smelting complex, Carretera Vinto, Oruro Department	2	
Do.	Empresa Minera Colquiri [Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 100%]	Colquiri silver, tin, and zinc mine, Inquisivi Province, Inquisivi Province, La Paz Department	NA	
Do.	Empresa Minera Huanuni [Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 100%]	Cerro Rico Mine, Potosi Department	NA	
Tin	Empresa Minera Barrosquira Ltda. (private, 100%)	Caracoles Mine, Inquisivi Province, La Paz Department	500	
Do.	Empresa Minera Colquiri [Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 100%]	Colquiri silver, tin, and zinc mine, Inquisivi Province, Inquisivi Province, La Paz Department	18,000	
Do.	Empresa Minera Huanuni [Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 100%]	Huanuni Mine, Dalence Province, Oruro Department	10,000	
Tin, refined	Empresa Metalúrgica Vinto S.A. (Government, 100%)	Vinto smelting complex, Carretera Vinto, Oruro Department	18,000	
Do.	Operaciones Metalúrgicas S.A. (private, 100%)	Huajara Industrial Park, east Oruro, Oruro Department	3,360	
Tin-lead alloys	Empresa Metalúrgica Vinto S.A. (Government, 100%)	Vinto smelting complex, Carretera Vinto, Oruro Department	200	
Tungsten, W content	Empresa Minera Himalaya [Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 100%]	Himalaya Mine, Murillo Province, La Paz Department	NA	
Do.	Small-scale mining operations and cooperatives (private, 100%)	Bolsa Negra, Enramada, Reconquistada Mines, near the former International Mining Co.'s Chojilla Mine, Sud Yungas Province; Chambilaya and Chicote Grande Mines, Inquisivi Province; Mercedes, San Antonio, Ucumarini Mines, Larecaja Province, La Paz Department	1,200	
Zinc	Compañía Minera PAS (Bolivia) S.A. [Pan American Silver Corp. joint venture with Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 95%, and Trafigura Beheer B.V., 5%]	San Vicente Mine, Potosi Department	8,000	
Do.	Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 55.45%, and Sociedad Minera Illapa S.A. (Glencore plc, 100%), 45.55%	Bolivar and Porco Mines, Oruro and Potosi Departments	36,000	
Do.	Corporación Minera de Bolivia (COMIBOL) (Government, 100%)	Cerro Rico Mine, Potosi Department, and in areas immediately surrounding the San Cristobal Mine	85,000	
Do.	Empresa Minera Colquiri [Corporación Minera de Bolivia (COMIBOL) (Government, 100%), 100%]	Colquiri silver, tin, and zinc mine, Inquisivi Province, Inquisivi Province, La Paz Department	2,700	
Do.	Empresa Minera San Cristóbal S.A. (Sumitomo Corp., 100%)	San Cristobal Mine, southwestern Bolivia	270,000	

See footnotes at end of table.

TABLE 2—Continued  
BOLIVIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity <sup>e</sup>
Zinc—Continued	Empresa Minera Santa Lucia Ltda.	Santa Lucia lead and silver-zinc mine, Potosi Department	12,000
Do.	Sinchi Wayra S.A. (Glencore plc, 100%)	Asientos, Caballo Blanco, Colquechaquita, Comsur, Poopo, San Lorenzo, and Tres Amigos Mines, Potosi Department	120,000
Zinc, refined	Empresa Metalúrgica de Karachipampa [Corporación Minera de Bolivia (Government, 100%), 100%]	Karachipampa lead, silver smelter, and zinc refinery, Potosi Department	70,000

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.